CIVILPLAN CONSULTANTS

HUGHES DEVELOPMENTS LIMITED

Riverside Grove Residential Development

99 Escotts Road, Tuakau

Stormwater Management Guide for Landowners

DOCUMENT CONTROL RECORD

Document:	Stormwater Management Guide for Landowners
Project:	Riverside Grove Residential Development
Client:	Hughes Developments Limited
CP Project No:	2011
CP Document No:	LG001-v2
Date of Issue:	25 July 2019

Originator: .....

Alister Hood

Civil Engineer

Reviewed By .....

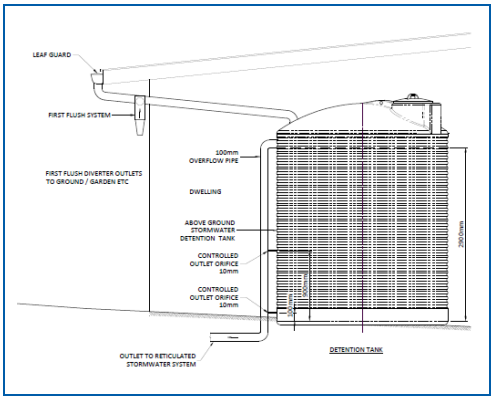
Ryan Pitkethley

Engineering Manager

Approved By: .....

Ryan Pitkethley

Engineering Manager



Contact Details:

Alister Hood

CivilPlan Consultants Ltd

PO Box 97796, Manukau 2241

P: 09 222 2445

M: 0279320030

E: alister@civilplan.co.nz

CIVILPLAN CONSULTANTS

TABLE OF CONTENTS

1. Introduction 3

2. Stormwater Mitigation Requirements 4

2.1 Purpose 4

2.2 Runoff from Roads (Council responsibility) 4

2.3 Runoff from Lots (each individual landowner's responsibility) 4

3. On-Lot Stormwater Devices 5

3.1 Lot Layout 5

3.2 Rainwater Detention Tank (for roof areas) 6

3.3 Rain Gardens (for paved areas) 9

3.4 Device Sizing 11

4. Keeping Our Waterways Clean 14

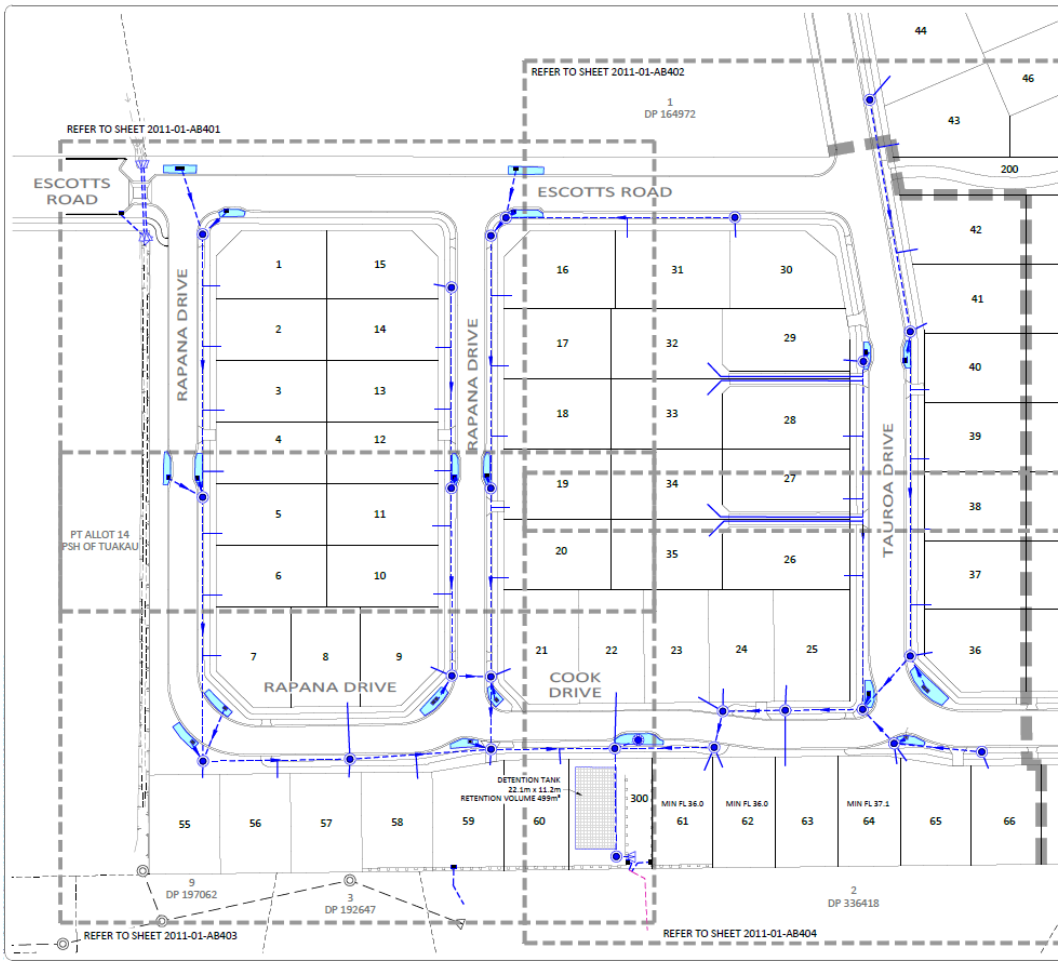
1. Introduction

This guide is applicable for lots 1-44 and 55-72 of the Riverside Grove Residential Development at 99 Escotts Road, Tuakau. This guide does not apply to lots 45-54 and 73-93, where stormwater mitigation is provided by downstream constructed wetlands.

Your property is part of a new 93 lot subdivision. The stormwater management for this subdivision has been approved as outlined in the *Riverside Grove Stormwater Report* by Birch Surveyors dated August 2017, and updated in the *Riverside Grove Stormwater Management Report* by CivilPlan Consultants dated March 2018.

A stormwater pipe network has been constructed as part of the subdivision which collects stormwater from the roads and provides a stormwater connection for each property, as shown in Figure 1, below. The subdivision also has a Resource Consent which requires stormwater devices to manage runoff from impervious areas. A consent notice on the Title of your property requires you to include a detention tank and a rain garden when you develop it.

Figure 1 – Stage 1 Subdivision Layout



2. Stormwater Mitigation Requirements

2.1 Purpose

All new developments create significant areas of new impervious surfaces including roofs, footpaths, driveways and roads. Rainwater cannot soak into these surfaces, so more stormwater runoff is generated than was prior to development. Increased stormwater runoff causes problems such as increased erosion and flooding, and deterioration of stream habitat.

New developments are required to mitigate these problems, using both "top of pipe" solutions on each individual property, and downstream "bottom of pipe" solutions such as rain gardens and treatment wetlands, which are owned and maintained by the Waikato District Council. In Stage 1 of this development the developer has constructed "top of pipe" rain gardens and a "bottom of pipe" detention tank which will manage the effects of the road runoff, and as a property owner you are also required to install "top of pipe" solutions when you build on your site. Stage 2 of the development will include constructed wetlands which will provide both quality treatment and detention and discharge to the Kairoa Stream to the east.

2.2 Runoff from Roads (Council responsibility)

The developer has constructed rain gardens in the road berms which provide quality treatment for road runoff. Flooding and erosion are mitigated by a large "bottom of pipe" detention tank as this is most cost effective. The tank stores and releases runoff to the downstream pond to the south at a controlled rate, which ensures that:

- Peak flows in large storms (up to the 1 in 10 year storm) are reduced to no more than pre-development flow.
- Runoff from smaller storms is captured and released over 24 hours to reduce stream erosion.

These devices are owned and operated by the Council and are only big enough to manage the road runoff.

2.3 Runoff from Lots (each individual landowner's responsibility)

Each property owner (lots 1-44 and 55-72) is required to construct a rain garden and a detention tank to manage the stormwater runoff from their own property. The detention tank stores runoff from the roof and releases it to the pipe network at a controlled rate. The rain garden provides quality treatment for runoff from paved areas such as driveways, and also incorporates detention storage. The storage provided in the two devices ensures that:

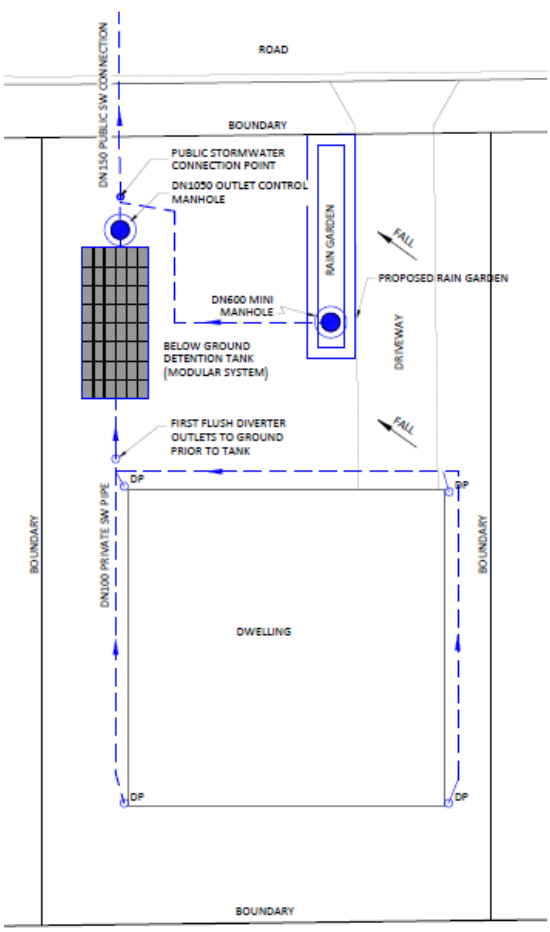
- Peak flows from the lot are are reduced to no more than pre-development flow, and
- Runoff from the lot in smaller storms is captured and released over 24 hours to reduce stream erosion.

3. On-Lot Stormwater Devices

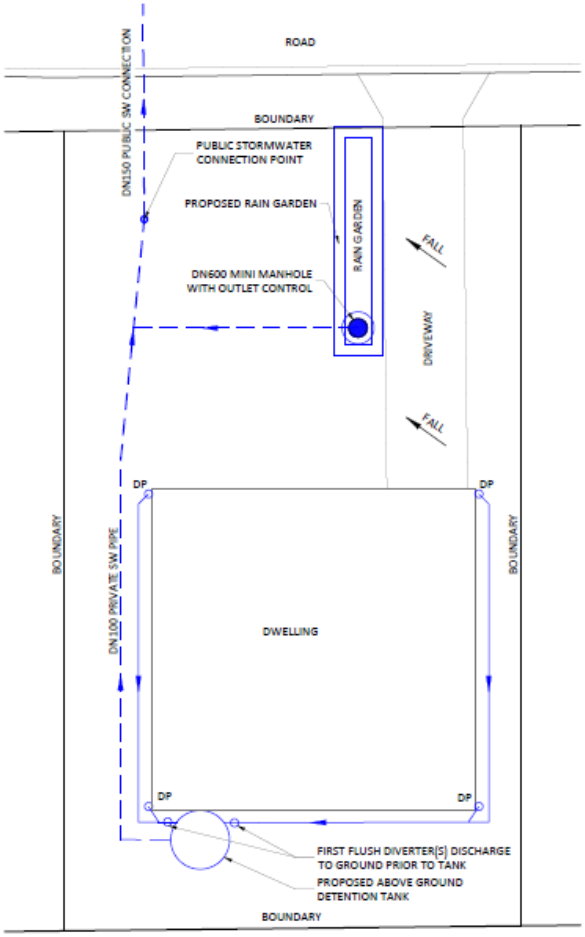
3.1 Lot Layout

When you apply for Building Consent you will be required to include a rainwater detention tank to collect water from all roof areas, and a rain garden to collect runoff from all impervious paved areas. Figure 2 below shows example lot layouts for an option with an above ground tank and an option with a below ground tank.

Figure 2 – Typical Lot Layouts



with below ground tank



with above ground tank

3.2 Rainwater Detention Tank (for roof areas)

The downpipes from your roof will be connected to a tank which provides temporary ("live") storage of roof runoff.

The tank size is calculated as per Table 2 below. There is no requirement for rainwater reuse, and if you want the tank to capture water for reuse you will need to add additional "dead storage" volume for that.

A wide variety of tanks are available for installation either above or below ground. The tank outlet needs to be higher than your property's connection to the stormwater pipe network, so that it can drain by gravity.

An underground tank will be shallow due to the depth of the connection to the pipe network. With a shallower tank the footprint needs to be bigger than a deeper above ground tank, because more volume is "not utilised" above the level of the overflow pipe / top of tank (due to tank cover requirements) and below the outlet orifice. Due to this the outlet sizing operates less optimally, and therefore the volume of a deeper/taller above ground tank can be slightly smaller than a shallower below ground tank.

Refer to Figures 3 and 4, below, for typical details for an above ground and a below ground tank option.

Figure 3 – Below Ground Tank Typical Detail

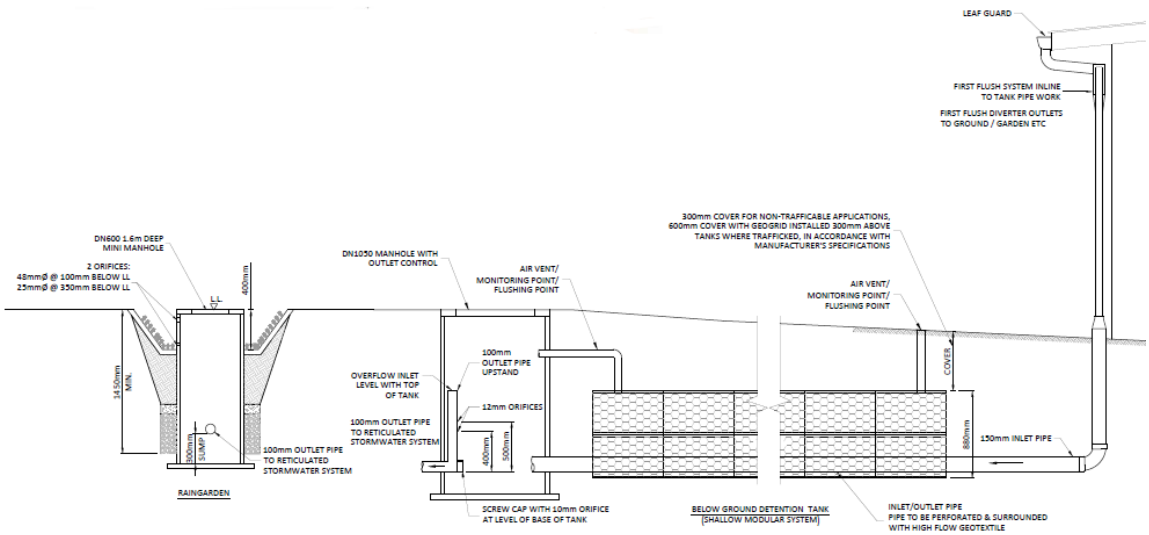
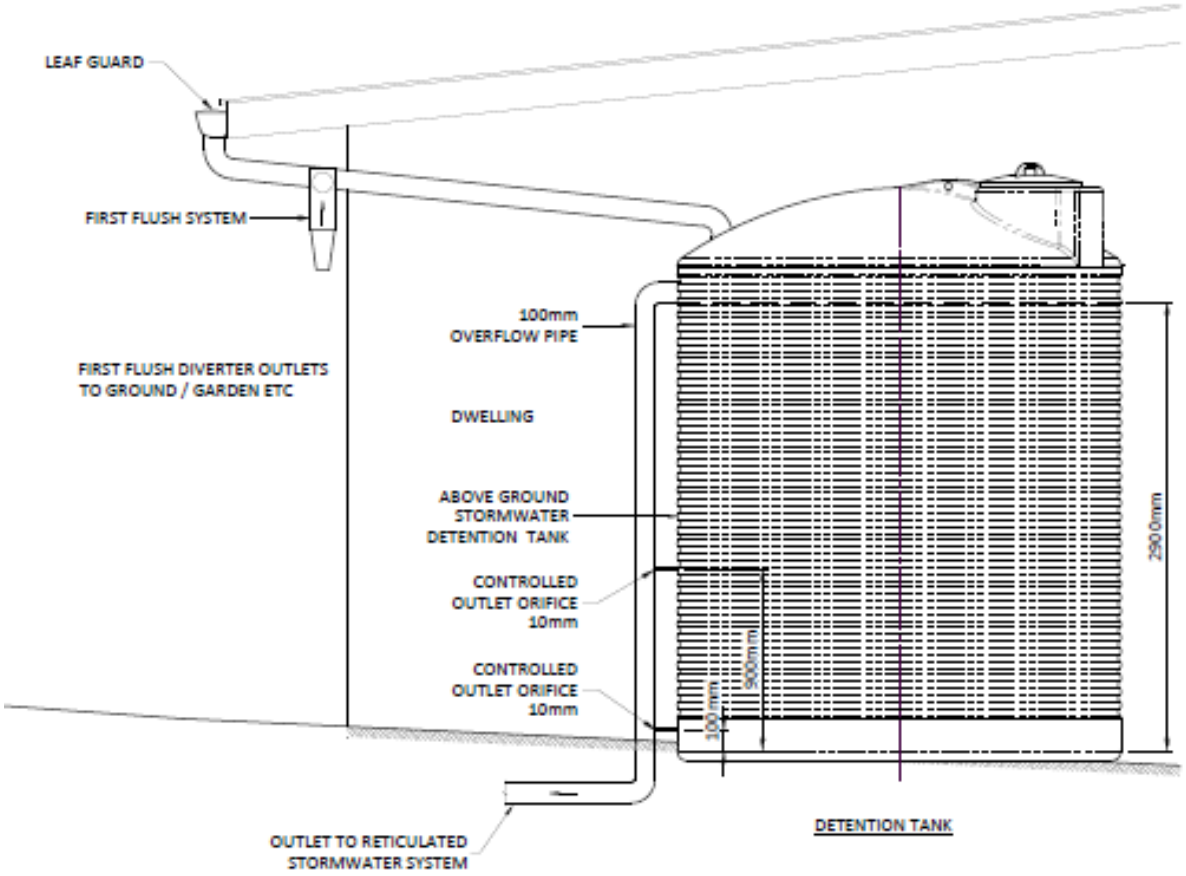


Figure 4 – Above Ground Tank Typical Detail



3.2.1 Inspections and Maintenance

The detention tank requires regular inspection and maintenance to ensure it continues to operate effectively. Refer to Table 1 below for an inspection schedule.

In particular, it is important to identify if the tank fails to drain down between storms, which would occur if the small orifices are blocked.

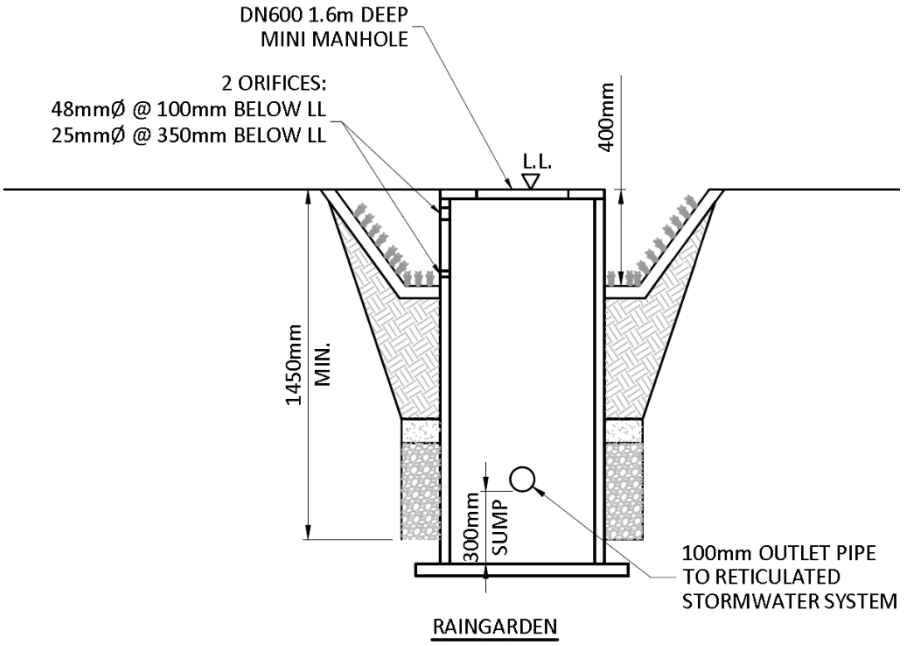
Table 1: Detention Tank Maintenance Schedule

		Frequency		
Device Feature	Recommended Action	3 monthly	6 monthly	Yearly
Gutters, Spouting and tank inlet	Check and clean gutters and spouting and leaf strainer. Check that pipe fittings are still secure and have not separated.		✓	
	Check and clean leaf strainer.	✓		
Tank hatches & covers	Ensure access hatches are closed.	✓		
	Inspect for correct fit and seal.			✓
Overflow, outlet pipes & orifices	Inspect to ensure that all orifice and overflow outlets are clear and drain freely.	✓		
Tank	Inspect the tank for leaks, sediment build-up and structural integrity (particularly once the tank is 20 years old). Check seismic restraint (above ground tanks). Clean out sediment build-up as required.			✓
Foundation Pad (typically required for above ground tank)	Check for any signs of settlement or cracking of the concrete.			✓

3.3 Rain Gardens (for paved areas)

A rain garden is a landscaped area with free draining soil that runoff is directed to. Impermeable (paved) areas on your property will need to drain into a rain garden with a plan area of 5% of the paved area. A typical detail for the rain garden is provided below. The temporary storage volume in the rain garden is important i.e. do not fill the surface ponding area back in!

Figure 5 – Rain Garden Detail



3.3.1 Construction

Ideally the rain garden should not be built until the rest of the site has been constructed and the site stabilised. It must be protected from stormwater flows carrying high sediment loads during construction activities from your site or neighbouring sites. If it is not protected during construction then the planting soil mix will need to be replaced. If work on the bioretention system needs to commence before the rest of the site is stabilised then the device should be constructed, but not planted, and covered with a geofabric and topsoil. This will later be removed and the device planted once the rest of the site has been stabilised.

3.3.2 Plants

Native plants are preferable but not essential. Any plants which suit your garden may be used. The plants should be able to tolerate short periods of inundation and longer dry periods, be perennial rather than annual, have deep fibrous root systems and have spreading rather than clumped growth forms.

Note that the use of wetland plants is not recommended as these plants are not well suited to free draining soils.

3.3.3 Maintenance

Long-term maintenance of the rain garden is important. Remember that it is a garden and not just a drainage system – it is generally low maintenance, not NO maintenance.

The rain garden will need water when it doesn't rain until the plants are established. During dry periods the under drain in the garden may cause the planting soil to dry out. Watering the vegetation on an as needed basis helps ensure a healthy condition and appearance.

- Mulch annually with hardwood mulch as this suppresses weeds and retains moisture.
- Every few years excess mulch may need to be removed.
- Weed regularly as you would with any garden.
- Don't park or drive on the device as this causes compaction and leaves ruts.
- Don't let fine sediment build up – if a crust forms remove it & rework the top layer of soil.
- Keep an eye on the plants – if they are unhappy they may need moving. Plants may need pruning, thinning or replacing from time to time.
- Strong water flows may cause erosion, this will need to be repaired and measures put in place to prevent recurrence.
- Check the outlet orifices and overflow for clogging and remove any build-up of rubbish or debris regularly.

3.4 Device Sizing

The tank and rain garden sizes are calculated according to Table 2 below, or determined from Figures 6, 7 and 8. An example is included for a lot with proposed 150m² roof and 90m² paved.

Both the tank and rain garden will drain to the stormwater pipe network. Refer to Figures 3, 4 and 5 or the attached drawings for typical details including outlet orifice sizing. The outlet orifice height may need to be adjusted based on the model of tank you use – refer to section 3.4.3 below.

Table 2: Device Sizing Summary

	Lot Numbers	On Lot Treatment Requirements	On Lot Detention Requirements	
Stage 1 - Catchment 1 (at-source)	Lots 1-44 Lots 55-66	Rain Garden with plan area of 5% of the paved area.	Above ground tank with volume (m³) of 5% of roof area (m²) or below ground tank with volume (m³) of 7% of roof area (m²).	400mm ponding depth above rain garden
Stage 2 - Catchments 2 and 3 (Wetlands 2 and 3)	Lots 45-54 Lots 73-93	NA	NA	NA
Stage 2 - Catchment 4 (at-source)	Lots 67-72	Rain Garden with plan area of 5% of the paved area.	Above ground tank with volume (m³) of 5% of roof area (m²) or below ground tank with volume (m³) of 7% of roof area (m²).	400mm ponding depth above rain garden

Figure 6 – Rain Garden Sizing

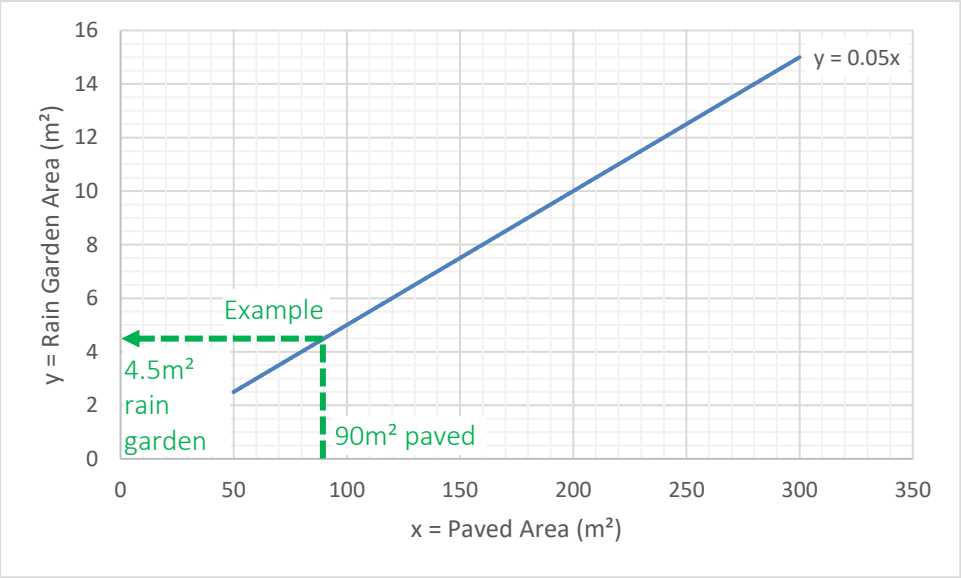


Figure 7 – Detention Tank Sizing (above ground option)

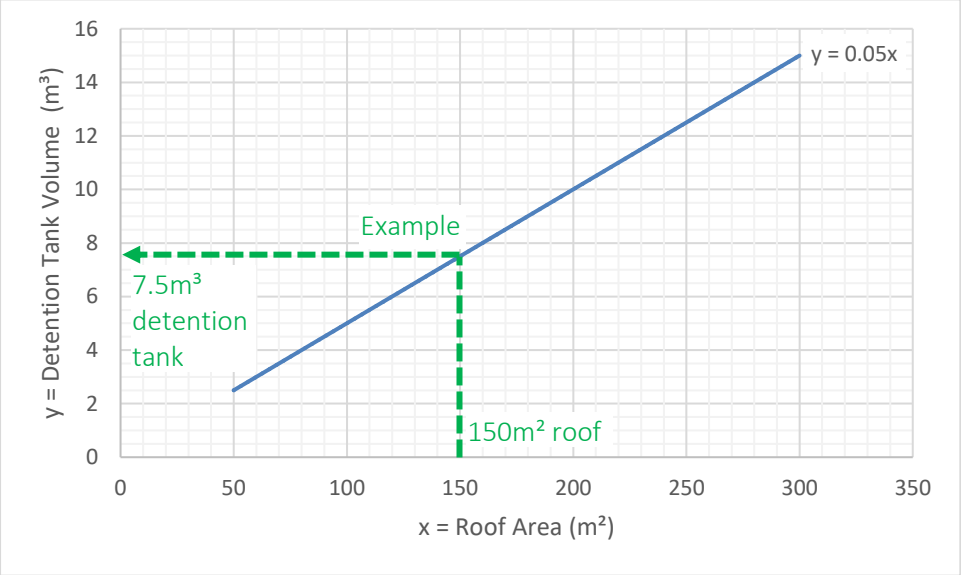
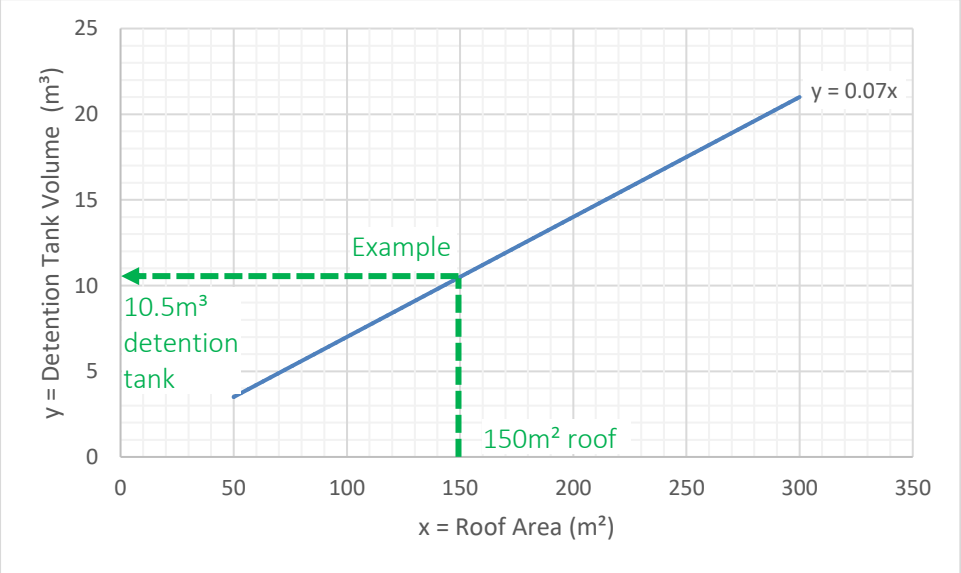


Figure 8 – Detention Tank Sizing (below ground option)



3.4.1 Permeable Pavement and Decks

Open wooden decks and "permeable pavement" are considered "self-mitigating" so they can be ignored when sizing your tank and rain garden. This includes special porous concrete, gobi blocks, and some other interlocking pavers.

Hamilton City Council provides a guide for the design, construction and maintenance of permeable pavement at:
https://www.hamilton.govt.nz/our-council/council-publications/manuals/Pages/Three-Waters-Management-Practice-Notes.aspx

3.4.2 Future Extensions

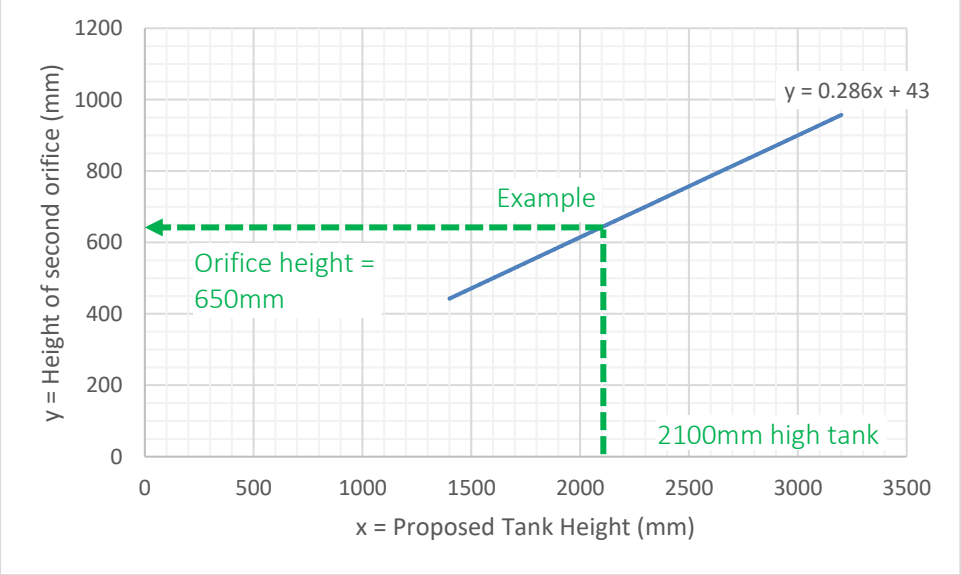
If in the future you extend your house or create additional impervious paved areas then you will need to upgrade your detention tank or rain garden to a larger size to allow for the increase area. If rather than upgrading to a larger size you increase the storage by adding a second tank, this should be configured in "series" with the original tank so that the outflow is controlled by a single set of orifices.

If future extensions are likely, it is recommended to consider "future proofing" your design by sizing based on a larger roof area; installing a larger tank initially will be cheaper than upgrading at a later date.

3.4.3 Outlet Orifices

The typical details specify orifice heights based on an 860mm high Cirtex Rainsmart modular below ground tank, and a 3m high above ground tank. If the proposed tank is a different height, the height of the second orifice should be adjusted according to Figure 9, e.g. for a 2100mm high tank the second orifice is centred at 0.286x2100+43 = 644mm

Figure 9 – Height of Second Orifice



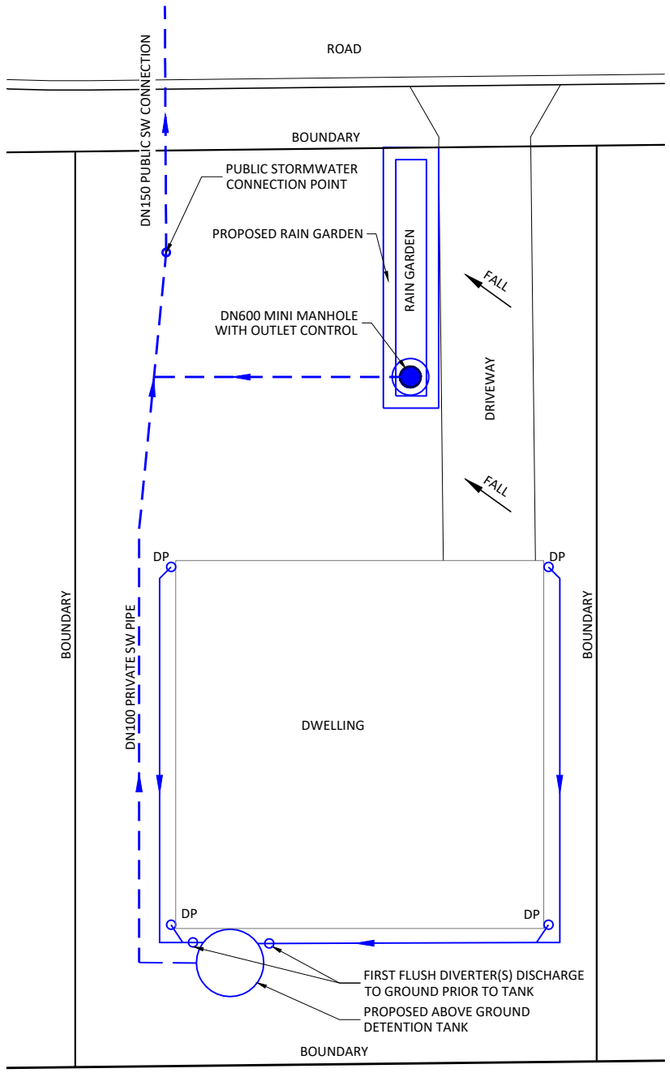
4. Keeping Our Waterways Clean

The rain gardens are intended only to provide treatment for normal stormwater runoff. Stormwater from your property and the roads is discharged to the stream and flows from there to the sea, so it is important that the water is not otherwise polluted.

Please make sure items such as these are kept out of the rain gardens and all stormwater drains:

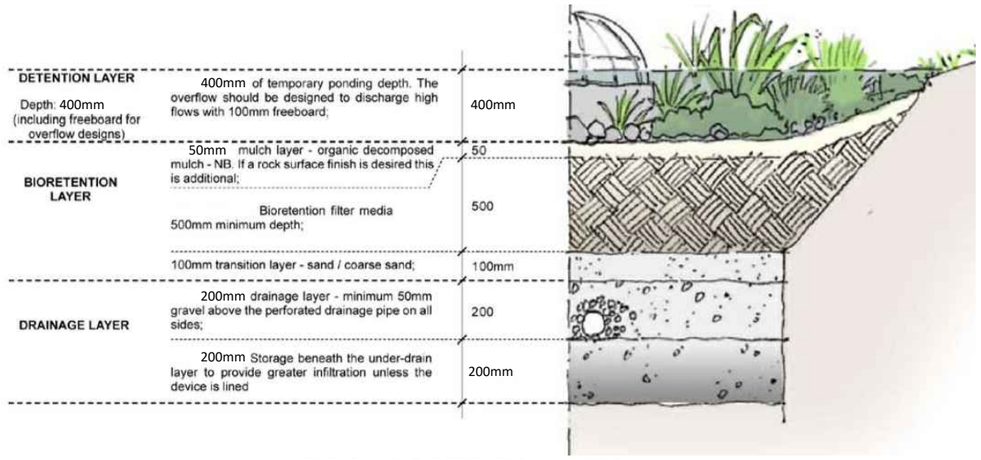
- Litter
- Lawn clippings and garden waste
- Pool or spa pool water
- Paint
- Chemicals, such as pesticides and fertilisers
- Waste from cars and boats, such as oil, fuel and antifreeze
- Animal waste
- Construction materials and debris

S:\Jobs\2011 - Hughes Developments Tuakau\reports\on-lot stormwater devices\Stormwater Management Guide for Landowners-v2.docx



TYPICAL STORMWATER DETENTION SYSTEM PLAN

SCALE: (A1/A3) 1:100/1:200

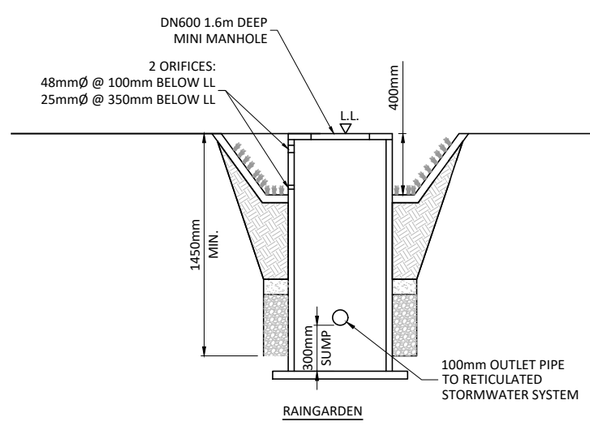


TYPICAL BIO-RETENTION LAYERS

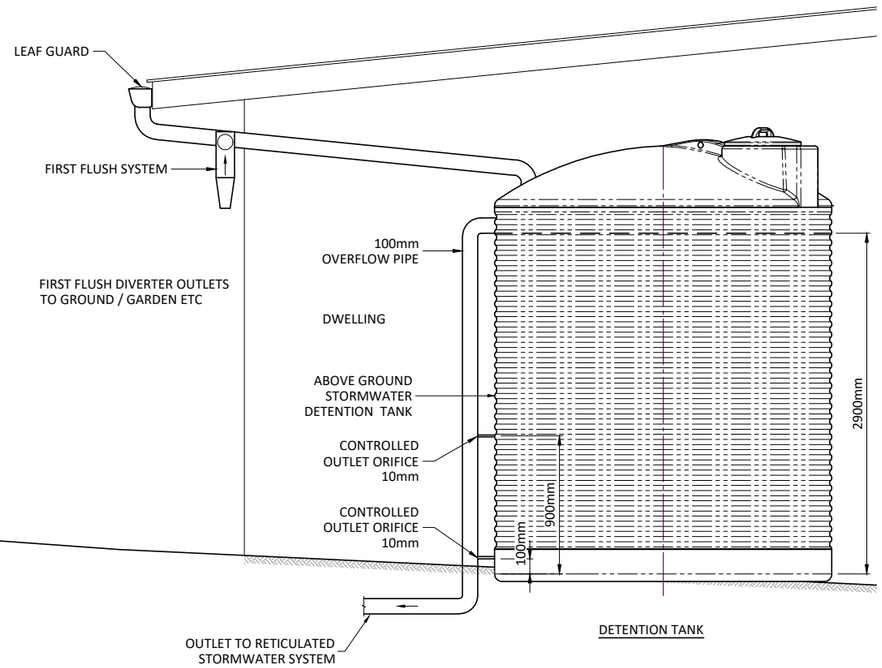
N.T.S.

NOTES:

1. RAINGARDEN DESIGN BASED ON HAMILTON CITY COUNCIL THREE WATERS MANAGEMENT PRACTICE NOTE HCC04.
2. TANK AND RAINGARDEN LOCATION SHOWN ARE INDICATIVE ONLY. ACTUAL LOCATIONS TO BE CONFIRMED ON SITE.
3. REFER TO TANK MANUFACTURER'S SPECIFICATION AND INSTALLATION GUIDELINES WHEN INSTALLING TANK.



RAINGARDEN



DETENTION TANK

TYPICAL STORMWATER DETENTION SYSTEM LAYOUT

SCALE: (A1/A3) 1:20/1:40

REV	REVISION DETAILS	BY	DATE
5	FIRST FLUSH DIVERTERS CLARIFIED	RJP	25.07.19
4	FOR INFORMATION	RJP	11.07.19
3	FOR INFORMATION	RJP	11.07.19
2	FOR INFORMATION	RJP	10.07.19
1	FOR INFORMATION	MM	28.03.18

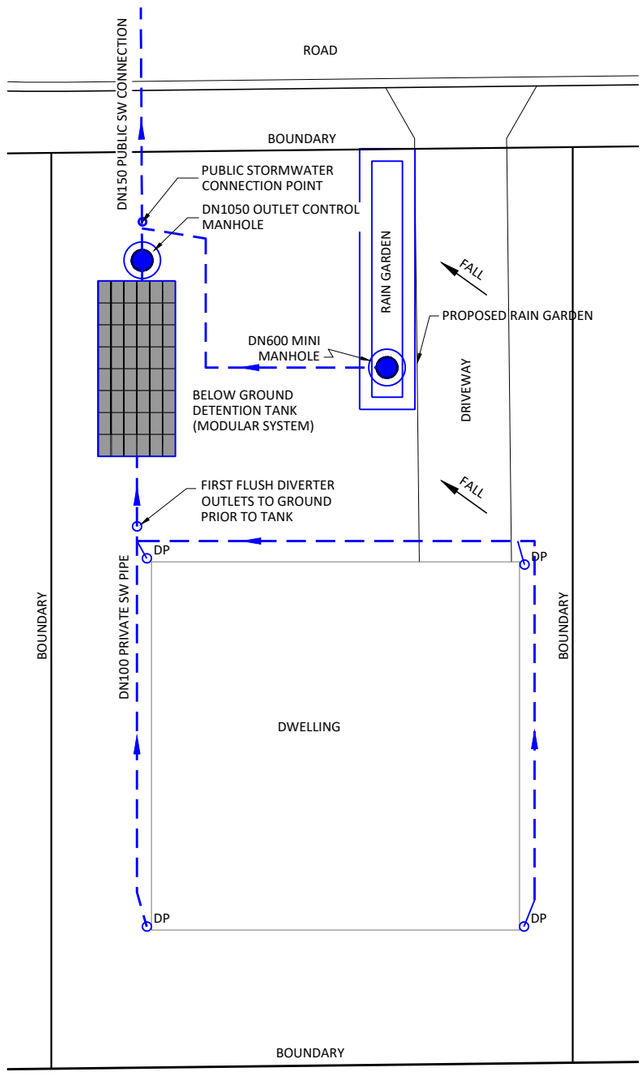
DRAWN: MM DATE: 12.03.18
CHECKED: RJP DATE: 11.07.19
APPROVED: RJP DATE: 11.07.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

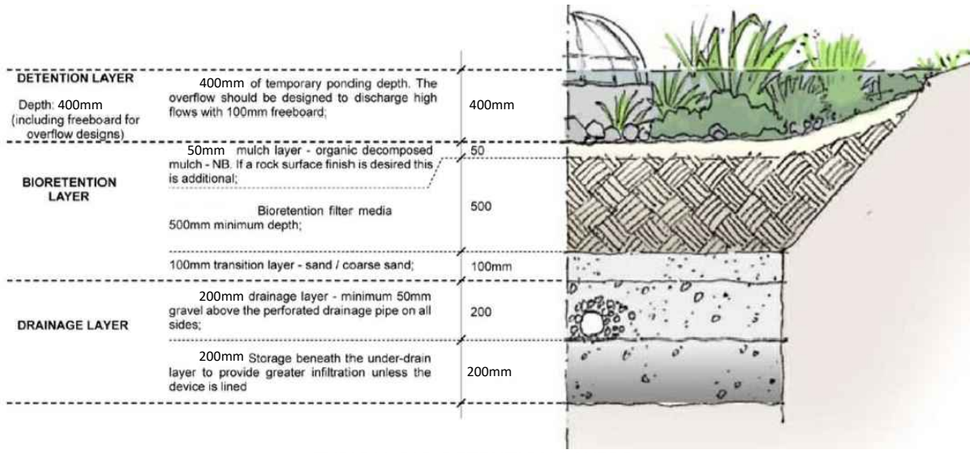
SHEET TITLE:
ON-LOT STORMWATER MITIGATION
TYPICAL LOT LAYOUT
ABOVE GROUND DETENTION SYSTEM

ISSUE STATUS: FOR INFORMATION
SCALE: (A1/A3) AS SHOWN
SCALE BAR N.T.S.
DRAWING NUMBER: 2011-01-SK18-1 REV: 5



TYPICAL STORMWATER DETENTION SYSTEM PLAN

SCALE: (A1/A3) 1:100/1:200

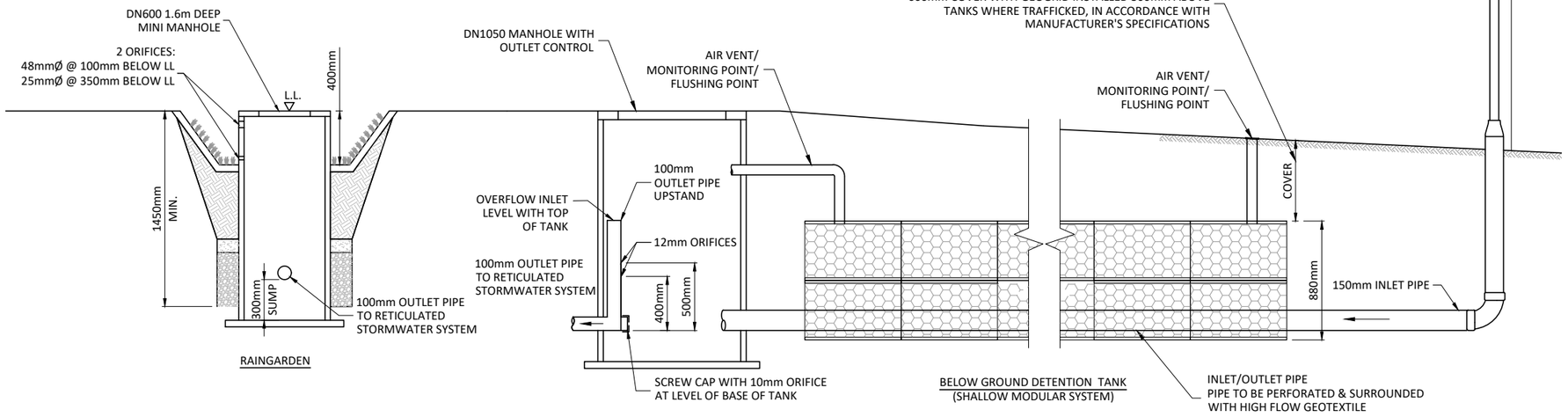


TYPICAL BIO-RETENTION LAYERS

N.T.S.

NOTES:

1. RAINGARDEN DESIGN BASED ON HAMILTON CITY COUNCIL THREE WATERS MANAGEMENT PRACTICE NOTE HCC04.
2. TANK AND RAINGARDEN LOCATION SHOWN ARE INDICATIVE ONLY. ACTUAL LOCATIONS TO BE CONFIRMED ON SITE.
3. REFER TO TANK MANUFACTURER'S SPECIFICATION AND INSTALLATION GUIDELINES WHEN INSTALLING TANK.



TYPICAL STORMWATER DETENTION SYSTEM LAYOUT

SCALE: (A1/A3) 1:20/1:40

REV	REVISION DETAILS	BY	DATE
5	FIRST FLUSH DIVERTERS CLARIFIED	RJP	25.07.19
4	FOR INFORMATION	RJP	11.07.19
3	FOR INFORMATION	RJP	11.07.19
2	FOR INFORMATION	RJP	10.07.19
1	FOR INFORMATION	MM	28.03.18

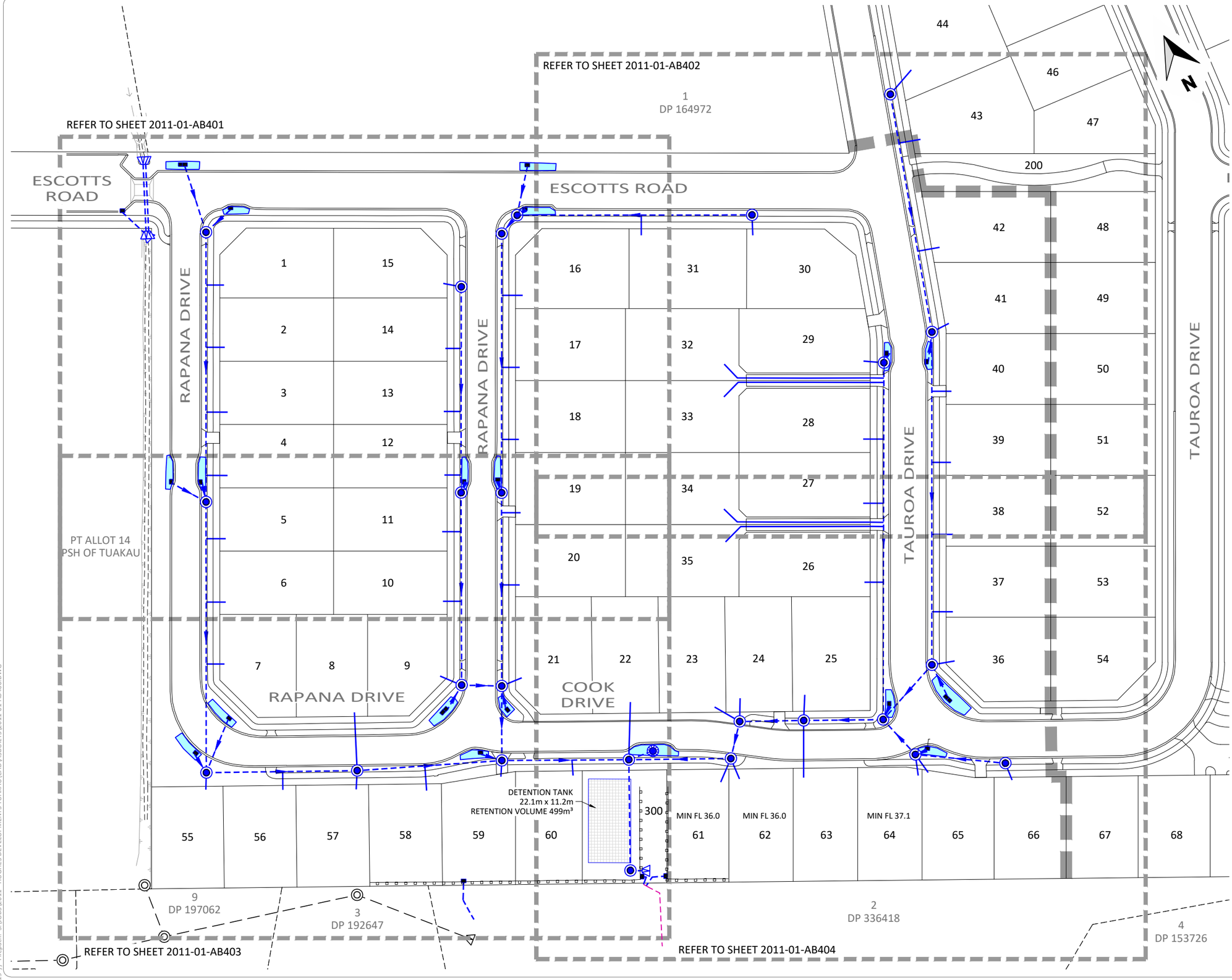
DRAWN: MM DATE: 12.03.18
CHECKED: RJP DATE: 11.07.19
APPROVED: RJP DATE: 11.07.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
ON-LOT STORMWATER MITIGATION
TYPICAL LOT LAYOUT
BELOW GROUND DETENTION SYSTEM

ISSUE STATUS: FOR INFORMATION
SCALE: (A1/A3) AS SHOWN
SCALE BAR N.T.S.
DRAWING NUMBER: 2011-01-SK18-2 REV: 5



LEGEND

EXISTING

- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

DRAWN: DKP DATE: 05.2019
CHECKED: MRR DATE: 26.06.19
APPROVED: RJP DATE: 26.06.19

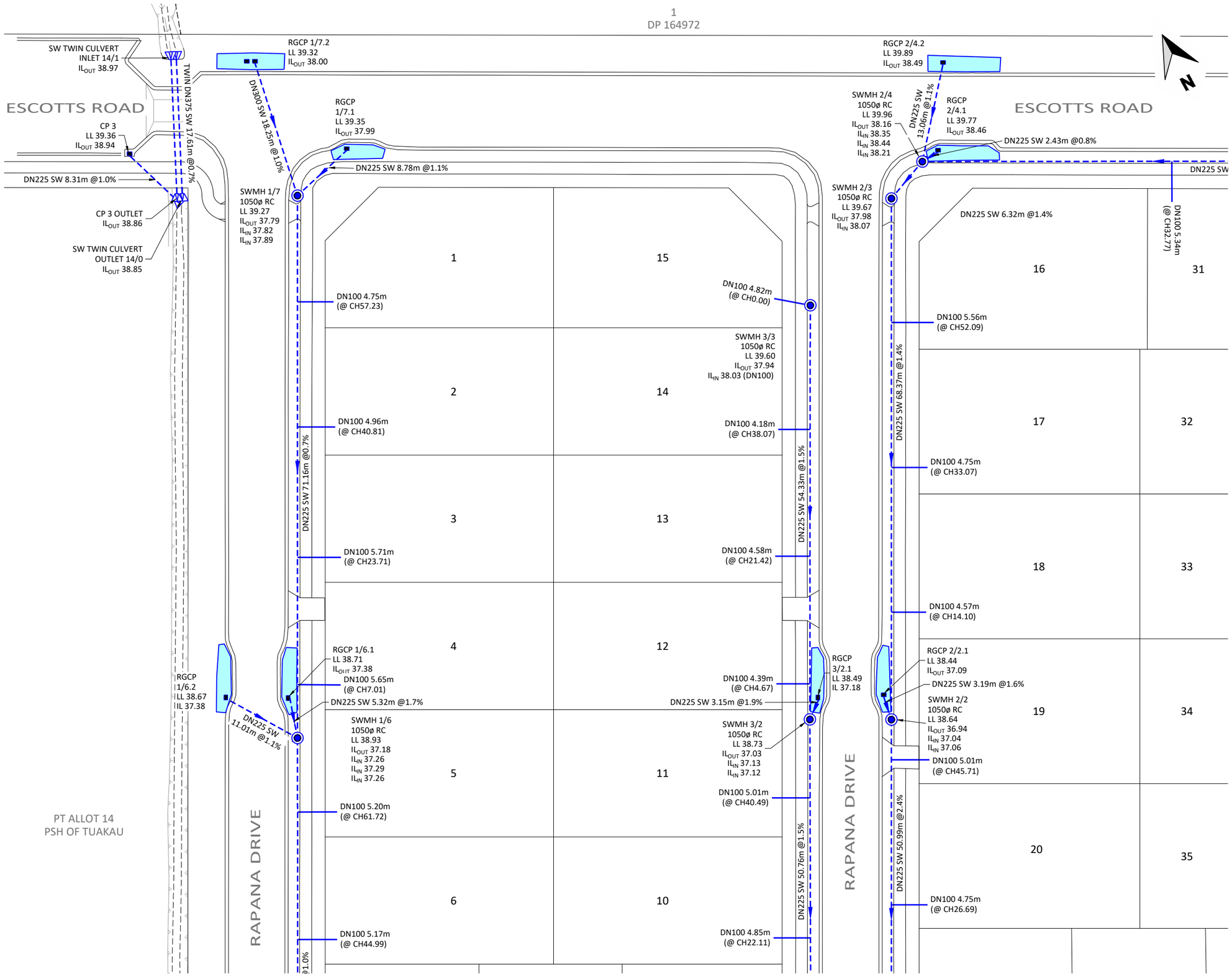
CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - OVERALL LAYOUT
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:500 / 1:1000
SCALE BAR 1:1000@A3 0 10 20 30 40 50m
DRAWING NUMBER: 2011-01-AB400 REV: A

1
DP 164972



LEGEND

EXISTING

- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

DRAWN: DKP DATE: 05.2019
CHECKED: MRR DATE: 26.06.19
APPROVED: RJP DATE: 26.06.19

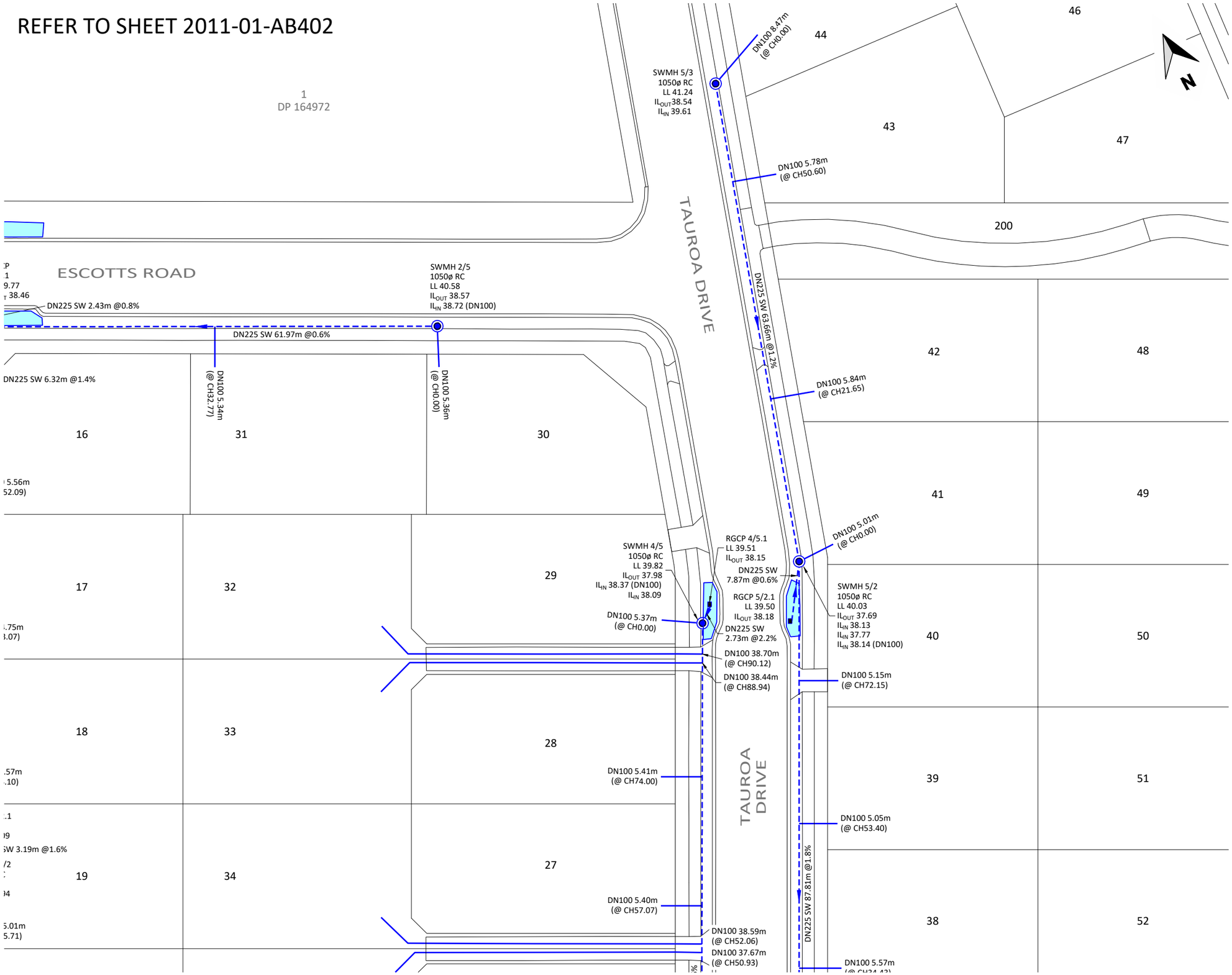
CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - DETAIL SHEET 1
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:250 / 1:500
SCALE BAR 1:500@A3 0 5 10 15 20 25m
DRAWING NUMBER: 2011-01-AB401 REV: A

REFER TO SHEET 2011-01-AB402



LEGEND

EXISTING

- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

DRAWN:	DKP	DATE: 05.2019
CHECKED:	MRR	DATE: 26.06.19
APPROVED:	RJP	DATE: 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - DETAIL SHEET 2
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:250 / 1:500
SCALE BAR 1:500@A3 0 5 10 15 20 25m
DRAWING NUMBER: 2011-01-AB402 REV: A

PT ALLOT 14
PSH OF TUAKAU

RAPANA DRIVE

RGCP 1/6.2
LL 38.67
IL 37.38

DN225 SW 11.01m @1.1%

RGCP 1/6.1
LL 38.71
IL_{OUT} 37.38

DN100 5.65m (@ CH7.01)

DN225 SW 5.32m @1.7%

SWMH 1/6
1050ø RC
LL 38.93
IL_{OUT} 37.18
IL_{IN} 37.26
IL_{IN} 37.29
IL_{IN} 37.26

DN100 5.20m (@ CH61.72)

DN100 5.17m (@ CH44.99)

DN300 SW 71.43m @1.0%

DN100 4.82m (@ CH28.66)

RGCP 1/5.2
LL 38.15
IL_{OUT} 36.74

DN225 SW 15.13m @0.8%

RGCP 1/5.1
LL 38.26
IL_{OUT} 36.97

DN225 SW 5.70m @0.7%

DN100 4.39m (@ CH4.67)

DN225 SW 3.15m @1.9%

RGCP 3/2.1
LL 38.49
IL 37.18

SWMH 3/2
1050ø RC
LL 38.73
IL_{OUT} 37.03
IL_{IN} 37.13
IL_{IN} 37.12

DN100 5.01m (@ CH40.49)

DN225 SW 50.76m @1.5%

DN100 4.85m (@ CH22.11)

SWMH 3/1
1050ø RC
LL 37.95
IL_{OUT} 36.17
IL_{IN} 36.26
IL_{IN} 36.70
IL_{IN} 36.27

DN100 5.77m (@ CH1.39)

DN225 SW 10.56m @4.0%

DN300 SW 7.70m @0.9%

DN100 15.41m (@ CH0.00)

RGCP 3/1.1
LL 37.67
IL_{OUT} 36.33

DN225 SW 5.83m @0.9%

RGCP 1/3.1
LL 37.55
IL_{OUT} 36.16

DN300 SW 38.29m @1.2%

DN300 SW 39.79m @2.0%

DN100 4.49m (@ CH0.00)

SWMH 1/5
1050ø RC
LL 38.60
IL_{OUT} 36.36
IL_{IN} 37.03 (DN100)
IL_{IN} 36.93
IL_{IN} 36.47
IL_{IN} 36.62

DN100 4.78m (@ CH19.65)

DN100 4.96m (@ CH0.00)

SWMH 1/4
1050ø RC
LL 38.13
IL_{OUT} 35.02
IL_{IN} 36.38 (DN100)
IL_{IN} 35.55
IL_{IN} 36.02 (DN100)

DN100 6.56m (@ CH20.35)

RGCP 2/2.1
LL 38.44
IL_{OUT} 37.09

DN225 SW 3.19m @1.6%

SWMH 2/2
1050ø RC
LL 38.64
IL_{OUT} 36.94
IL_{IN} 37.04
IL_{IN} 37.06

DN100 5.01m (@ CH45.71)

DN225 SW 50.99m @2.4%

DN100 4.75m (@ CH26.69)

SWMH 2/1
1050ø RC
LL 37.87
IL_{OUT} 35.60
IL_{IN} 35.75
IL_{IN} 35.74
IL_{IN} 36.56 (DN100)
IL_{IN} 36.18

DN100 5.73m (@ CH0.00)

DN225 SW 6.66m @0.9%

DN100 15.19m (@ CH0.00)

RGCP 2/1.1
LL 37.57
IL_{OUT} 36.24

DN300 SW 19.65m @5.3%

DN100 4.27m (@ CH0.00)

SWMH 1/3
1050ø RC
LL 37.58
IL_{OUT} 34.43
IL_{IN} 34.55
IL_{IN} 36.11
IL_{IN} 34.56

DN100 4.11m (@ CH14.97)

DETENTION TANK
22.1m x 11.2m
RETENTION
VOLUME 499m³

2 x DN150 SW 29.23m @0.6%
2 x DN150 SW 29.23m @0.6%
2 x DN150 SW 29.23m @0.5%

DN600 SW 3.13m @0.6%

SWMH 1/1
2050ø RC
LL 34.66
LL 34.78
IL_{OUT} 31.32
2xIL_{IN} 31.88
2xIL_{IN} 32.05
2xIL_{IN} 32.25
DN50 ORIFICE IL 31.88
DN300 ORIFICE IL 32.61
DN375 ORIFICE IL 33.33
TOP OF WEIR 34.00
SEE 2011-01-AB407 FOR MANHOLE DETAIL

CP 0
LL 30.92
IL_{OUT} 30.80

CP 2
LL 33.43
IL_{OUT} 33.01

DISCHARGE TO POND

COOK DRIVE

DN375 SW 6.74m @0.9%

DN375 SW 33.50m @1.9%

4 12 5 11 6 10 7 8 9 19 20 35 21 22 55 56 57 58 59 60 300

9
DP 197062

3
DP 192647

N

LEGEND

EXISTING

(CR) PLOTTED FROM COUNCIL RECORDS
DN1350 SW STORMWATER LINE AND MANHOLE

ASBUILT

DN300 STORMWATER LINE AND MANHOLE
X.Xm STORMWATER CONNECTION
STORMWATER CATCHPIT
SCRUFFY DOME INLET/OUTLET MANHOLE
STORMWATER INLET
STORMWATER OUTLET
RAIN GARDEN
RECHARGE PIT
RAIN GARDEN
STORMWATER DETENTION TANK
UNDERFILL DRAIN
STAGE BOUNDARY

NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

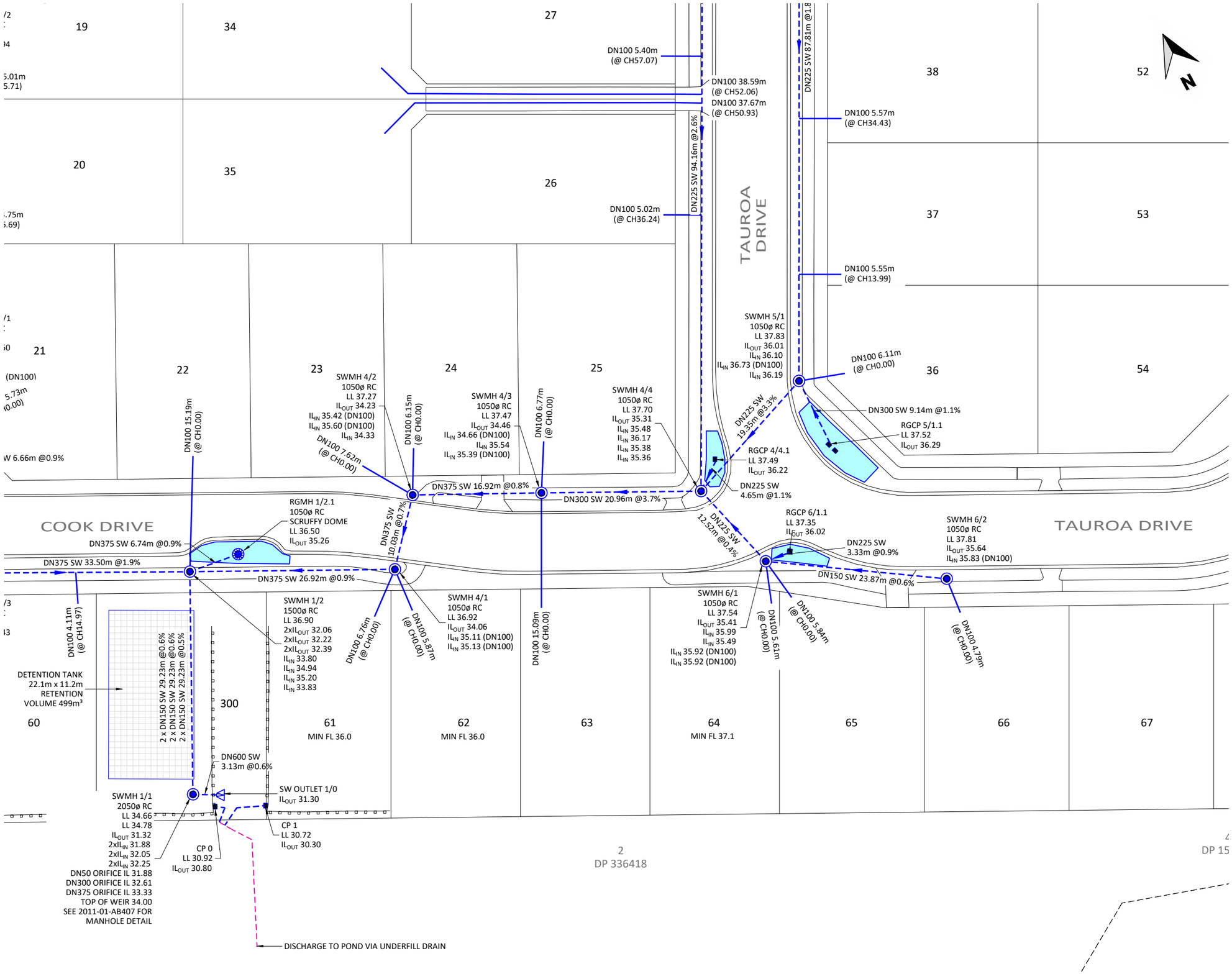
DRAWN: DKP 05.2019
CHECKED: MRR 26.06.19
APPROVED: RJP 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - DETAIL SHEET 3
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:250 / 1:500
SCALE BAR 1:500@A3 0 5 10 15 20 25m
DRAWING NUMBER: 2011-01-AB403 REV: A



LEGEND

EXISTING

- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

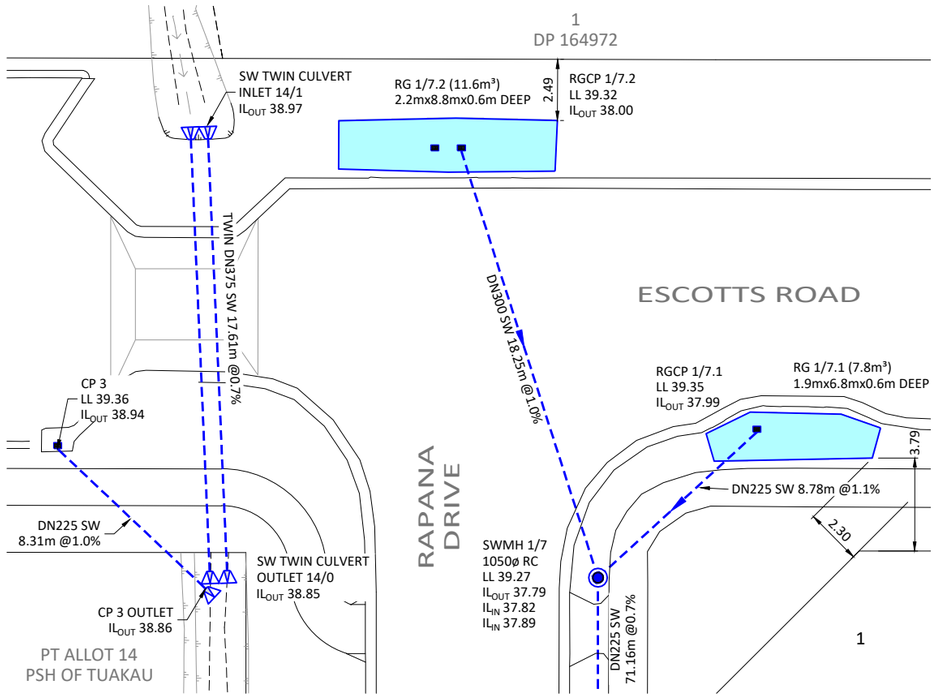
DRAWN: DKP 05.2019
CHECKED: MRR 26.06.19
APPROVED: RJP 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

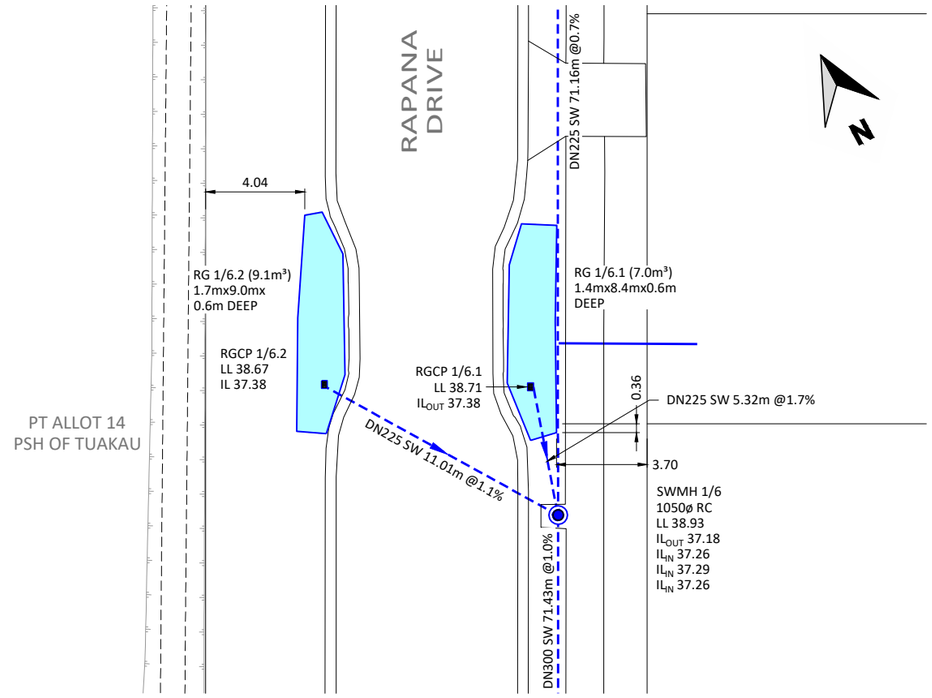
SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - DETAIL SHEET 4
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:250 / 1:500
SCALE BAR 1:500@A3 0 5 10 15 20 25m
DRAWING NUMBER: 2011-01-AB404 REV: A



RAIN GARDEN DETAIL 1

SCALE: (A1/A3) 1:125/1:250



RAIN GARDEN DETAIL 2

SCALE: (A1/A3) 1:125/1:250

LEGEND

EXISTING

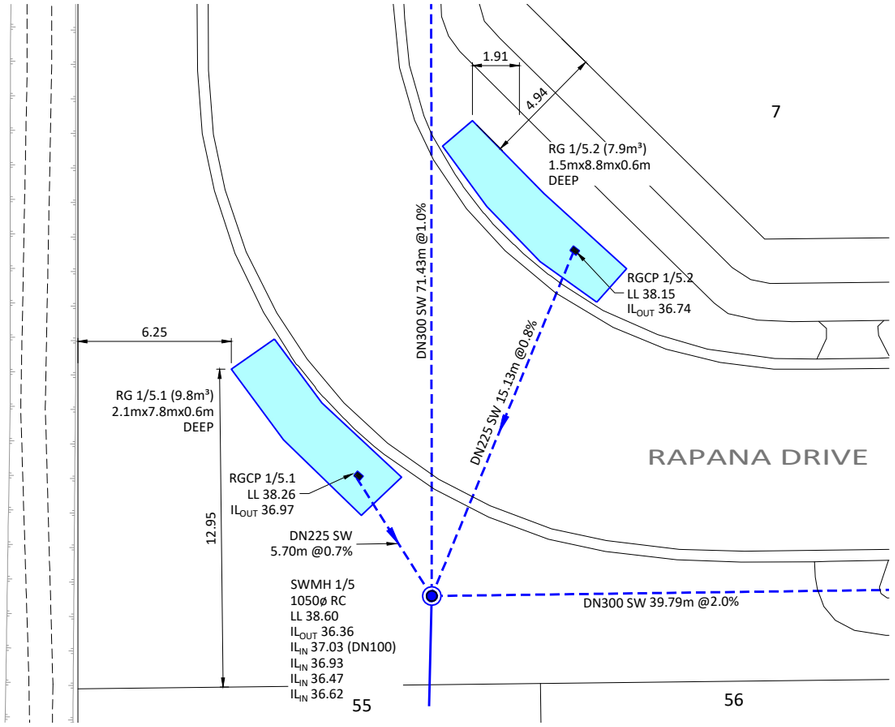
- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

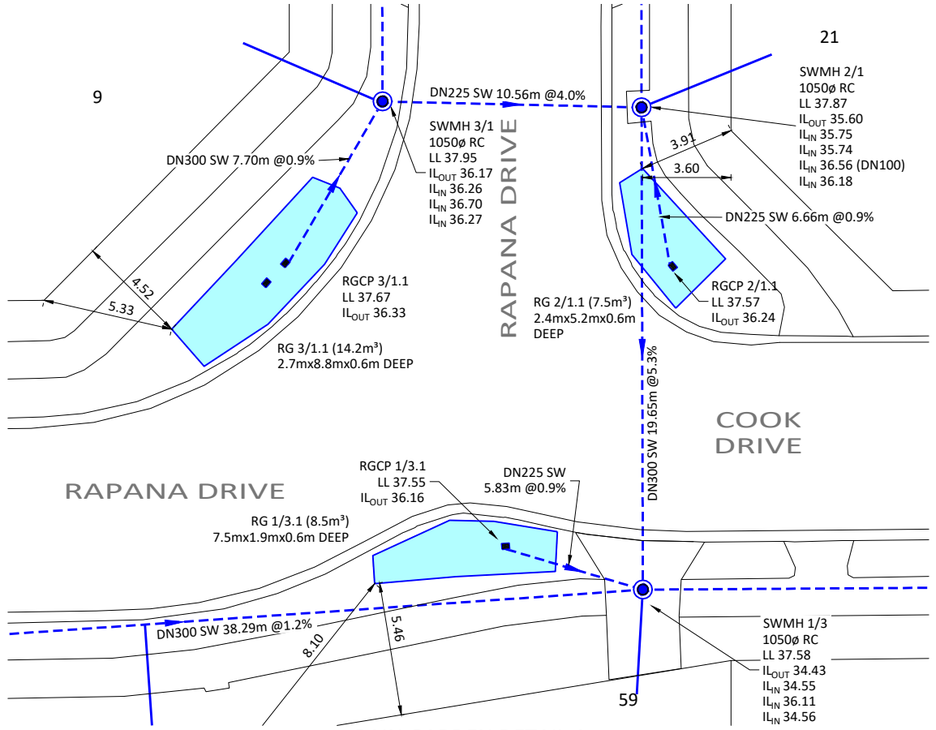
NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.



RAIN GARDEN DETAIL 3

SCALE: (A1/A3) 1:125/1:250



RAIN GARDEN DETAIL 4

SCALE: (A1/A3) 1:125/1:250

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

KEYPLAN

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

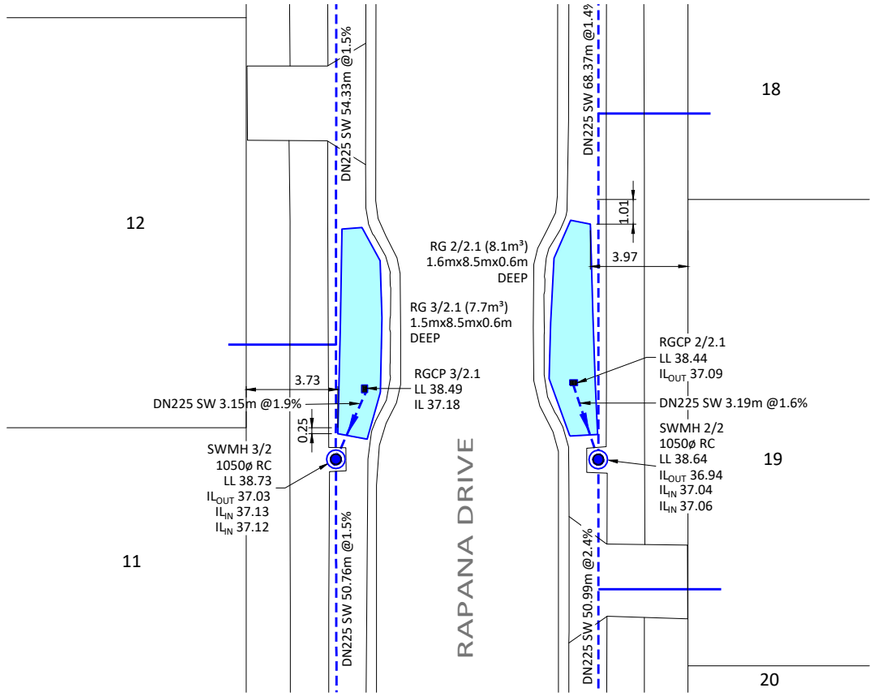
DRAWN: DKP DATE: 05.2019
CHECKED: MRR DATE: 26.06.19
APPROVED: RJP DATE: 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

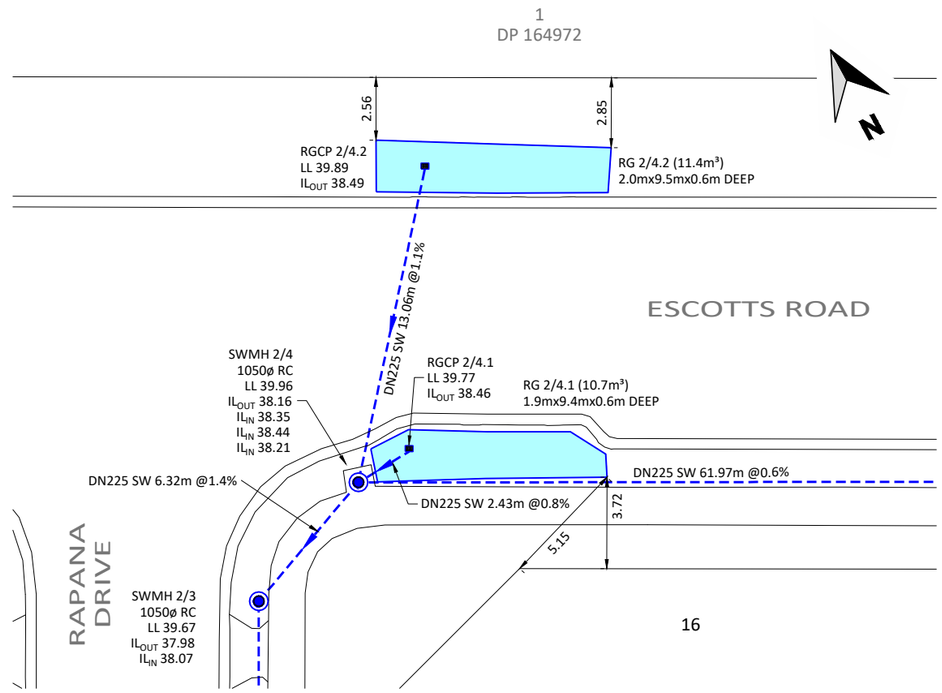
SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - RAIN GARDEN - DETAIL SHEET 1
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:125 / 1:250
SCALE BAR 1:250@A3 0 2.5 5 7.5 10 12.5m
DRAWING NUMBER: 2011-01-AB405 REV: A



RAIN GARDEN DETAIL 5

SCALE: (A1/A3) 1:125/1:250



RAIN GARDEN DETAIL 6

SCALE: (A1/A3) 1:125/1:250

LEGEND

EXISTING

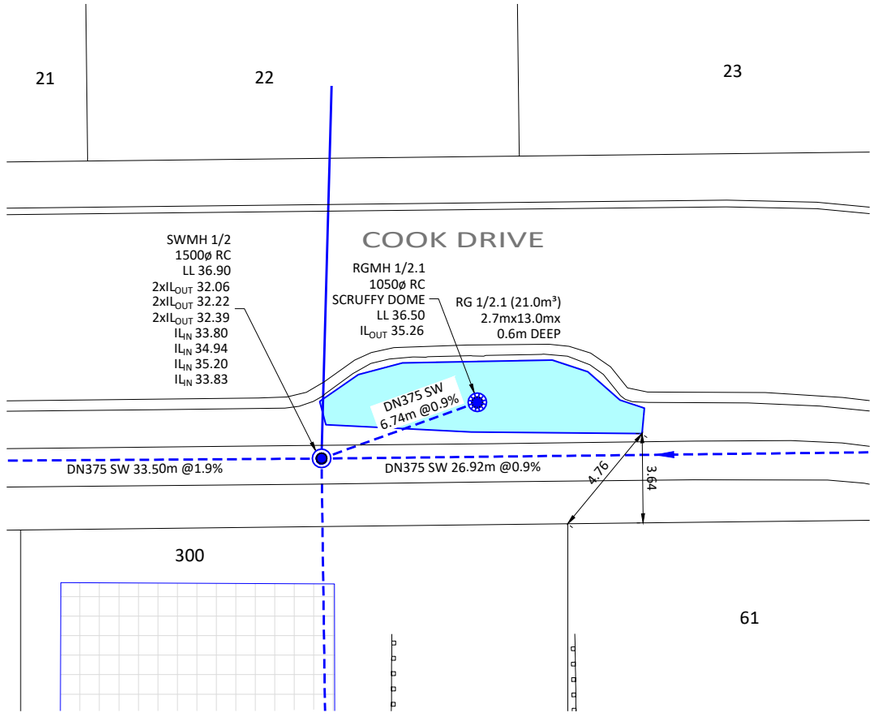
- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

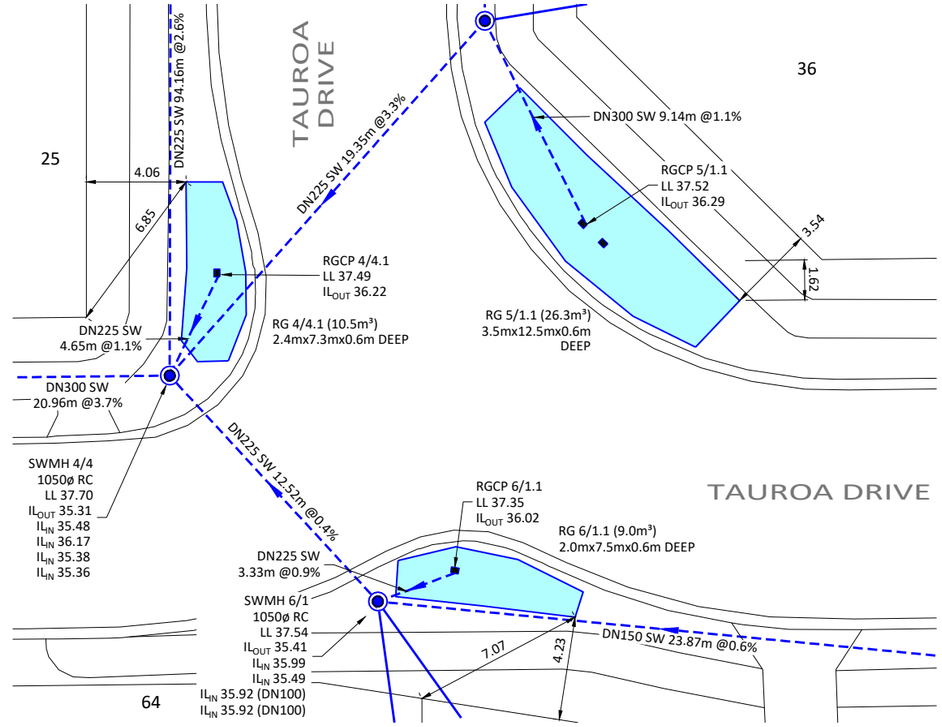
NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.



RAIN GARDEN DETAIL 7

SCALE: (A1/A3) 1:125/1:250



RAIN GARDEN DETAIL 8

SCALE: (A1/A3) 1:125/1:250

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE

KEYPLAN

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

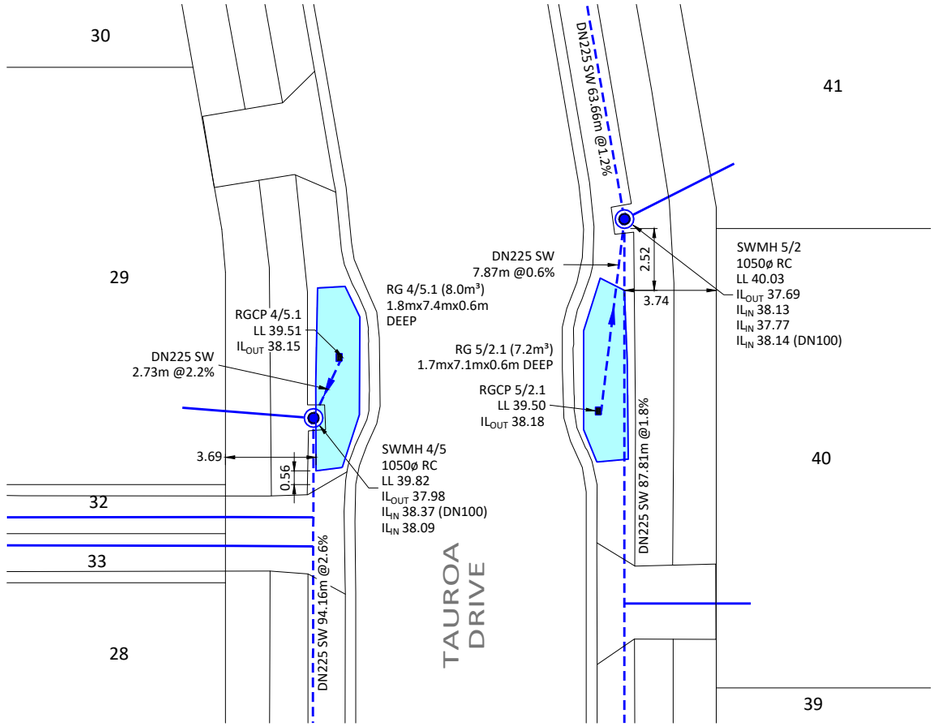
DRAWN: DKP 05.2019
CHECKED: MRR 26.06.19
APPROVED: RJP 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

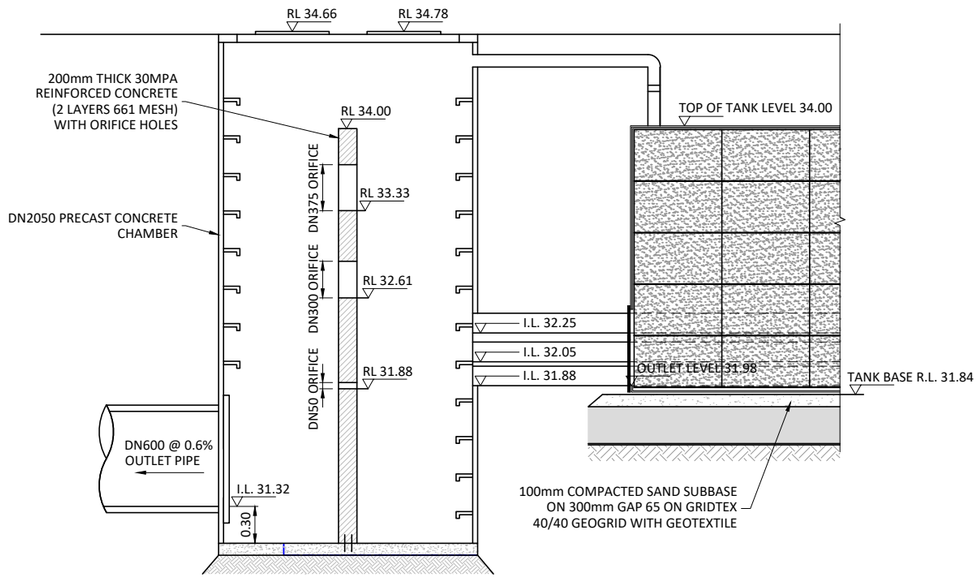
SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - RAIN GARDEN - DETAIL SHEET 2
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:125 / 1:250
SCALE BAR 1:250@A3 0 2.5 5 7.5 10 12.5m
DRAWING NUMBER: 2011-01-AB406 REV: A



RAIN GARDEN DETAIL 9

SCALE: (A1/A3) 1:125/1:250



STORMWATER MANHOLE 1/1 DETAIL

SCALE: (A1/A3) 1:125/1:250

SCHEDULE OF COORDINATES SW MANHOLES-GD2000		
POINT No.	mE	mN
SWMH 1/0	416269.23	757047.26
SWMH 1/1	416266.50	757048.79
SWMH 1/2	416279.91	757074.76
SWMH 1/3	416250.26	757090.35
SWMH 1/4	416215.31	757105.98
SWMH 1/5	416179.97	757124.26
SWMH 1/6	416213.56	757187.29
SWMH 1/7	416247.07	757250.07
SWMH 2/1	416259.47	757107.71
SWMH 2/2	416283.49	757152.69
SWMH 2/3	416315.70	757212.99
SWMH 2/4	416321.57	757215.35
SWMH 2/5	416376.27	757186.22
SWMH 3/1	416250.27	757112.89
SWMH 3/2	416274.06	757157.74
SWMH 3/3	416299.70	757205.63
SWMH 4/1	416303.80	757062.35
SWMH 4/2	416310.45	757069.87
SWMH 4/3	416325.50	757062.14
SWMH 4/4	416344.09	757052.47
SWMH 4/5	416388.61	757135.44
SWMH 5/1	416362.23	757059.17
SWMH 5/2	416403.61	757136.62
SWMH 5/3	416423.48	757197.10
SWMH 6/1	416347.23	757040.35
SWMH 6/2	416367.11	757027.14

SCHEDULE OF COORDINATES RAINGARDEN CATCHPITS-GD2000		
POINT No.	mE	mN
RG 1/2.1	416286.58	757073.79
RG 1/3.1	416246.12	757094.44
RG 1/5.1	416179.53	757129.94
RG 1/5.2	416191.64	757133.89
RG 1/6.1	416215.14	757192.38
RG 1/6.2	416207.56	757196.53
RG 1/7.1	416255.58	757252.25
RG 1/7.2	416250.35	757268.04
RG 2/1.1	416257.43	757101.37
RG 2/2.1	416284.02	757155.83
RG 2/4.1	416323.99	757215.49
RG 2/4.2	416329.98	757225.34
RG 3/1.1	416243.72	757108.85
RG 3/2.1	416276.54	757159.67
RG 4/4.1	416347.86	757055.20
RG 4/5.1	416390.80	757137.07
RG 5/1.1	416361.97	757050.03
RG 5/2.1	416399.09	757130.17
RG 6/1.1	416350.53	757039.90

SCHEDULE OF COORDINATES CATCHPITS-GD2000		
POINT No.	mE	mN
CP 0	416268.13	757046.12
CP 1	416274.42	757042.89
CP 2	416226.18	757066.69

LEGEND

EXISTING

- (CR) — PLOTTED FROM COUNCIL RECORDS
- DN1350 SW — STORMWATER LINE AND MANHOLE

ASBUILT

- DN300 — STORMWATER LINE AND MANHOLE
- X.Xm — STORMWATER CONNECTION
- STORMWATER CATCHPIT
- SCRUFFY DOME INLET/OUTLET MANHOLE
- STORMWATER INLET
- STORMWATER OUTLET
- RAIN GARDEN
- RECHARGE PIT
- RAIN GARDEN
- STORMWATER DETENTION TANK
- UNDERFILL DRAIN
- STAGE BOUNDARY

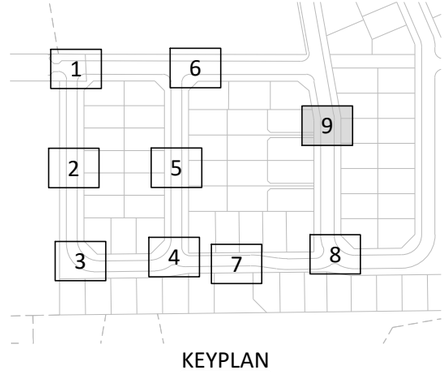
NOTES

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM.
2. COORDINATES ARE IN TERMS OF GD2000 MT EDEN CIRCUIT.
3. ALL STORMWATER LINES OVER DN150 ARE RCRRJ.
4. ALL DN 100 & DN 150 STORMWATER LINES ARE uPVC DWV SN16 AS/NZ 1260.
5. ALL SINGLE CATCHPIT LEADS ARE DN225 RCRRJ CLASS 4 PIPE.
6. ALL DOUBLE CATCHPIT LEADS ARE DN300 RCRRJ CLASS 4 PIPE.
7. ALL INVERTS ARE MEASURED CLOCKWISE FROM THE OUTLET.
8. MANHOLES ARE 1050mm UNLESS SHOWN OTHERWISE.
9. SEE SHEET 2011-01-AB405-AB407 FOR RAIN GARDEN DETAILS.
10. SEE SHEET 2011-01-AB407 FOR CO-ORDINATE SCHEDULES.
11. CONSTRUCTION WAS UNDERTAKEN IN 2018 AND 2019.

I, RYAN JAMES PITKETHLEY, BELIEVE ON REASONABLE GROUNDS THAT THE PIPE SIZES, FITTINGS POSITIONS, SCHEDULE OF CO-ORDINATES AND LID LEVELS, ARE CORRECT BASED ON THE INFORMATION SUPPLIED TO CIVILPLAN BY THE CONTRACTOR FOR THE WORK, TWOMEY CONSTRUCTION LTD.

RYAN JAMES PITKETHLEY
CMENGNZ CPENG

26.06.2019
DATE



KEYPLAN

REV	REVISION DETAILS	BY	DATE
A	ASBUILT ISSUED	RJP	26.06.19

DRAWN: DKP 05.2019
CHECKED: MRR 26.06.19
APPROVED: RJP 26.06.19

CIVILPLAN CONSULTANTS
Level 3, 3 Osterley Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
HUGHES DEVELOPMENTS LIMITED
99 ESCOTTS ROAD
TUAKAU

SHEET TITLE:
STORMWATER ASBUILT
STAGE 1 - RAIN GARDEN - DETAIL SHEET 3
SUB0311/18 & LUC0489/18

ISSUE STATUS: ASBUILT
SCALE: (A1/A3) 1:125 / 1:250
SCALE BAR 1:250@A3 0 2.5 5 7.5 10 12.5m
DRAWING NUMBER: 2011-01-AB407 REV: A