MAVEN

INFRASTRUCTURE REPORT

57 & 57a Schnapper Rock Road, Schnapper Rock

CIVIL ENGINEERING ▾ SURVEYING ▾ LAND DEVELOPMENT

PROJECT INFORMATION

CLIENT	KBS Design Group
PROJECT	175006

DOCUMENT CONTROL

DATE OF ISSUE	30/04/2021
REVISION	B
AUTHOR	John Duran Engineer
REVIEWED BY	Jignesh Engineer – Team Leader
APPROVED BY	Will Moore Director

Level 2, 12–14 Walls Road, Penrose.
PO Box 11605, Ellerslie, 1542.
New Zealand
Phone 09 571 0050
www.maven.co.nz

TABLE OF CONTENTS

1 INTRODUCTION 2

1.1 LOCATION OF SITE 2

1.2 DEVELOPMENT PROPOSAL 2

2 THREE WATERS INFRASTRUCTURE 4

1.3 WASTEWATER 4

1.4 STORMWATER 6

1.5 WATER 8

3 UTILITIES 9

4 CONCLUSION 9

1 INTRODUCTION

This infrastructure report is in support of a plan change to the development at 57 and 57a Schnapper Rock Road, Schnapper Rock. The information provided herein relates to the stormwater, wastewater, water supply and other service infrastructure and the potential capacity to service the future development.

1.1 LOCATION OF SITE

The site is located at 57 & 57a Schnapper Rock Road in Albany (herein referred to as 'the site'). The site is located on the southern corner of the Schnapper Rock Road and Oakway Drive intersection. Figure 1 shows an aerial image of the site and its surrounding features.

Figure 1: Location of the Site. Source: GeoMaps

1.2 DEVELOPMENT PROPOSAL

The proposal seeks Council approval to re-zone the site from its current residential – large lot zoning into Residential Mixed – housing and Single-lot zoning. This report focuses on the proposed infrastructure servicing for three waters and utilities. Infrastructure servicing is based on the concept plan shown in figure 2. A total of 93 lots are proposed and is subject to a finalised scheme plan.

Figure 2: Concept Masterplan

Terrace Housing 36 (39%

Zero-lot Line Detached Housing 32 (34%)

Standard Detached Housing 25 (27%)

Total 93 (100%)

Proposed Public Road (14.0m road reserve)

Proposed Private Accessway

Significant Ecological Area(protected land)

Riparian Margin (protected land)

2 THREE WATERS INFRASTRUCTURE

The following provides a summary of the three water engineering considerations. This strategy is based on the concept layout plan.

1.3 WASTEWATER

The Watercare Code of Practice for Land Development and Subdivision sets out the design principles for wastewater drainage and requires any development project to be provided with a means of wastewater disposal.

The site is located within a well-established wastewater reticulated area. However, due to the topography of the site and its surrounding area, a public gravity extension to the network provided immediate to the site cannot be achieved. Hence, the following servicing options are proposed.

Option 1 – Construction of a Low Pressure Sewer (LPS) system to service the site. This is a similar approach to the approved servicing method for the adjacent development (55 Schnapper Rock Rd). However, it shall be noted that any proposed public pressurised systems need to be located within a public road reserve. For the residential lots located within private ways, a 6-way meter bank shall be provided or a bulk supply point to the public LPS. The point of connection for the site shall be provided through the future pipe constructed by the adjacent development which is located within north-eastern corner of the Watercare Site.

Option 2 – Construction of a public gravity pipe extension from the Kyle Road wastewater pump station through proposed Lot 44 and Lot 33 & Lot 44 Common Accessway within the adjacent development will be required as shown indicatively on figure 3. The gravity extension within the adjacent development requires works to be undertaken prior to completion of the public roads. The gravity pipe extension will require installation within the road carriageway due to the various services (LPS system, water supply, power and telecommunication) located on the road berm. It shall be noted that “Land Owner Approval” is required prior to construction of the extension within any adjacent private land.

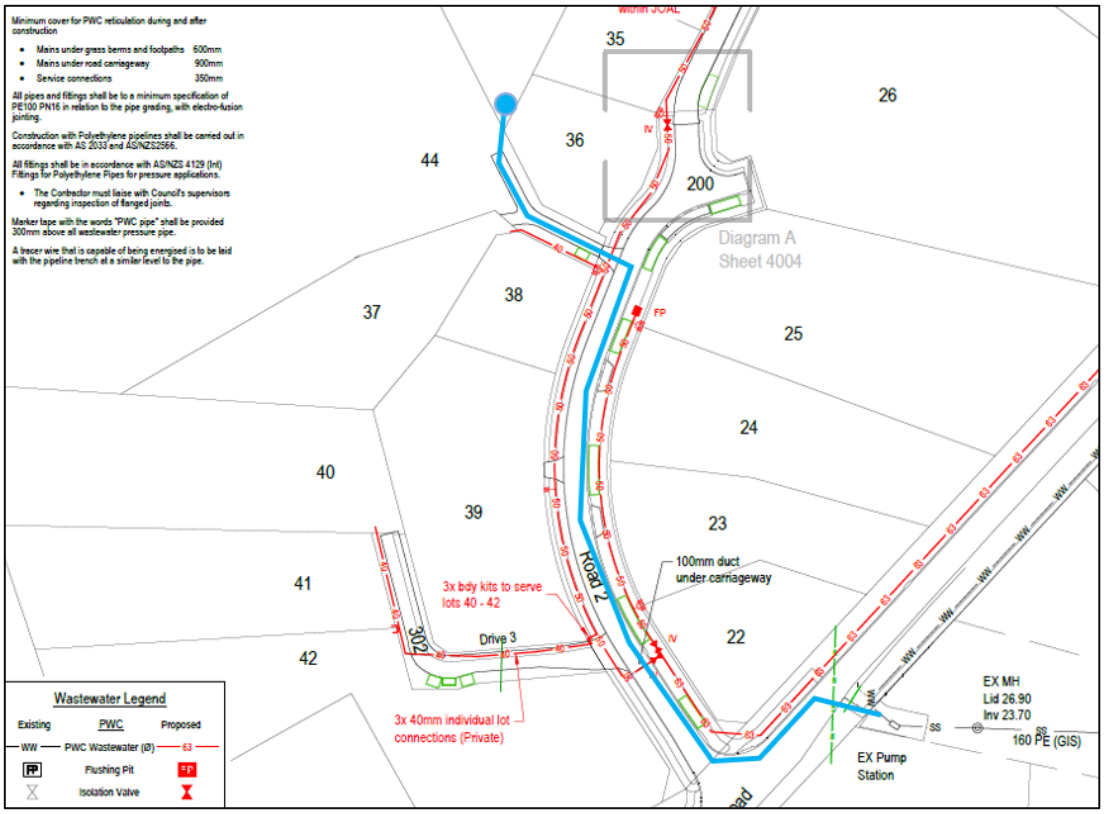


Figure 3: Indicative Gravity Wastewater Servicing

Option 3 – Construction of a new pump station within the site as indicated in Figure 4 below. An extension from the point of supply provided by the adjacent subdivision is required via gravity extension along Schnapper Rock Road towards the northern section of the site. The pump station shall service majority of the development through a new gravity network which discharge into a main holding chamber and pumped via a rising main. The rising main will be situated within the public road to be discharged into the wastewater gravity extension within Schnapper Rock Road.

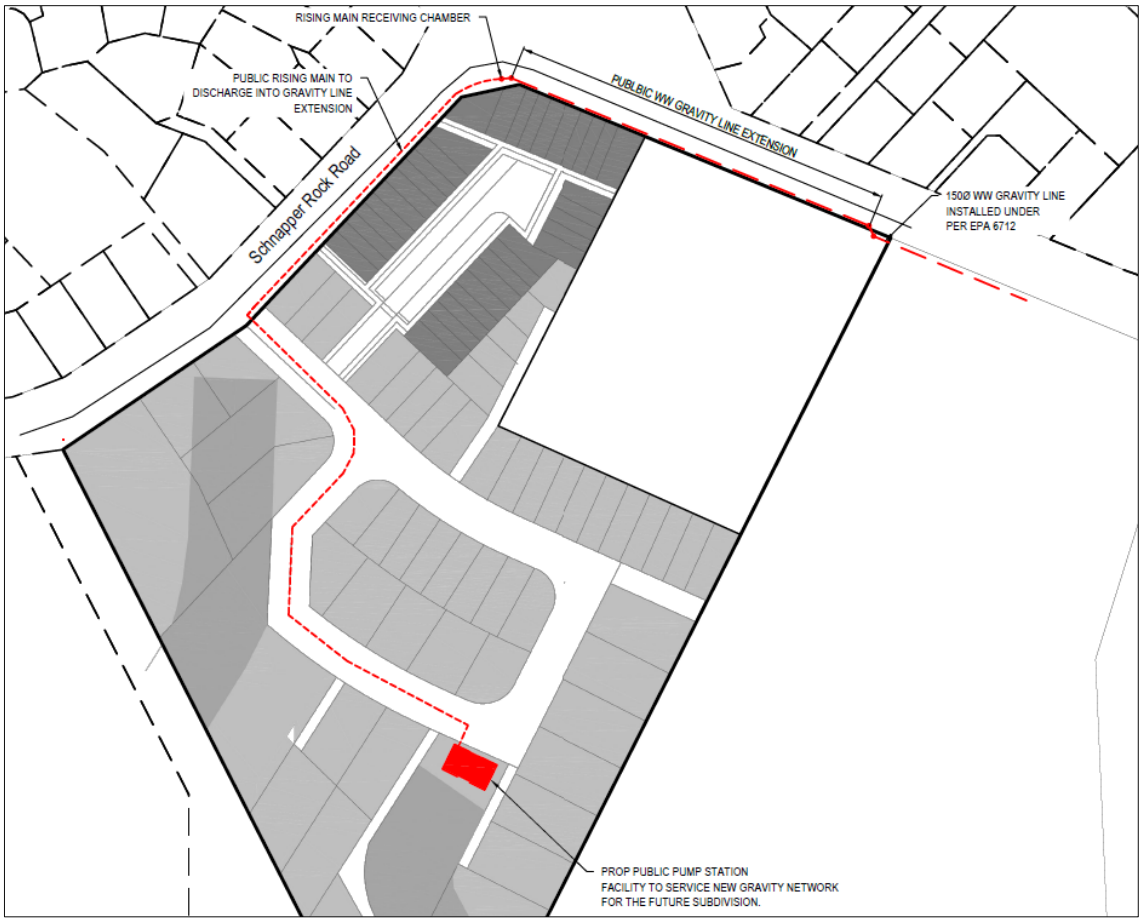


Figure 4: Indicative Wastewater Servicing – Pump Station and Rising Main

Information regarding the modelled network capacity downstream is to be investigated with Watercare as part of the Resource Consent process and the approval of the proposed options are subject to Watercare approval. The completed Watercare Planning assessment is attached in **Appendix A**, as required.

1.4 STORMWATER

The site is located within a well-established stormwater reticulated area. An existing water course is located within the adjacent site and the stormwater is being discharged to the existing water course. As part of the adjacent development, two connections to the public reticulation have been proposed (refer **Appendix B**). The development site will be serviced by public extensions from the adjoining site. The stormwater runoff generated from the proposed development will discharge into the existing stream, via the approved/proposed network. Any sites located below the invert level of the connection points shall be provided with onsite stormwater disposal measure such as level spreaders (to ensure sheet flow) at the building consent stage.

The site is located within the SMAF 1 control area. Stormwater mitigation as per the SMAF1 requirements (retention and detention) in therefore required. The existing overland flow paths and stream network can be seen below within Figure . It shall be noted that a separate Stormwater Management Plan “SMP” has been prepared separate to this report.

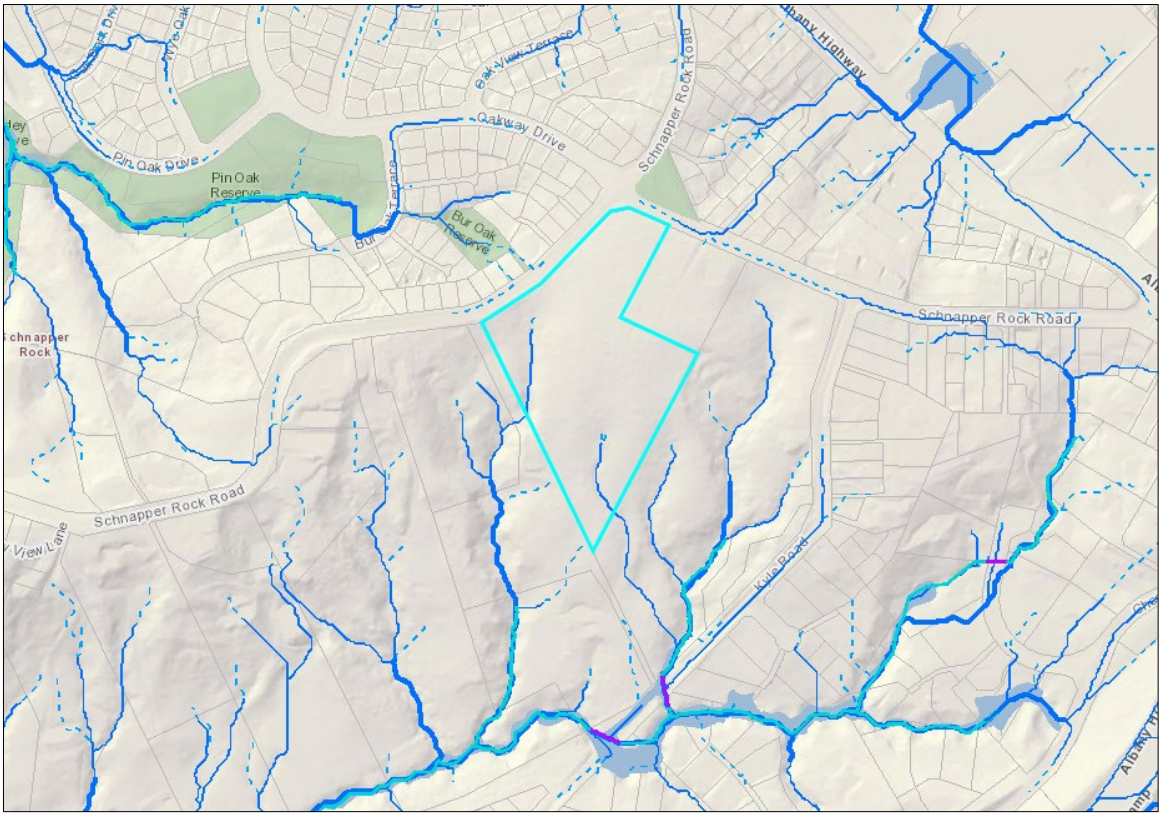


Figure 5: Existing OLFP and Stream network. Source: GeoMaps

1.4.1 SMAF 1 MITIGATION

The subject site is located within SMAF1 control area. As per SMAF1 requirements, all stormwater generated from the impervious areas (including roads) shall be mitigated prior to discharge to the public reticulation system. Retention (re-use) of the first 5mm runoff depth and the rest to be detained (drain down) within 24hr period is required as part of the SMAF1 controls.

Typically, detention/retention tanks for the individual lots and rain gardens for the roads are being used to meet the SMAF mitigations for greenfield subdivisions.

The sizes of the detention/retention tanks to be confirmed at the detailed design stage, with each lot subject to a consent notice stipulating minimum sizes that need to be adhered too and detailed at Building Consent stage accordingly

1.4.2 Stormwater Quality Treatment

As part of the AUP(OP) requirements, development of a new or redevelopment of an existing high use road greater than 1000m^2 shall require treatment prior to discharging to the public stormwater reticulation system. Further to this, the site is subject to the treatment requirements of the regionwide NDC which requires a higher level of baseline treatment. Treatment will be provided for the new public roads and common private driveways at source prior to discharging into the receiving environment.

1.4.3 Stormwater Reticulation

The proposal is to convey the stormwater for the majority of the sites impervious areas via a public reticulation system or private outlet structures where access to the network is unfeasible. The Auckland Council Stormwater Code of Practice sets out design and construction standards for stormwater and requires all land development projects to adhere this standard. Each catchment as shown in figure 6, will be provided with stormwater servicing through the options below.

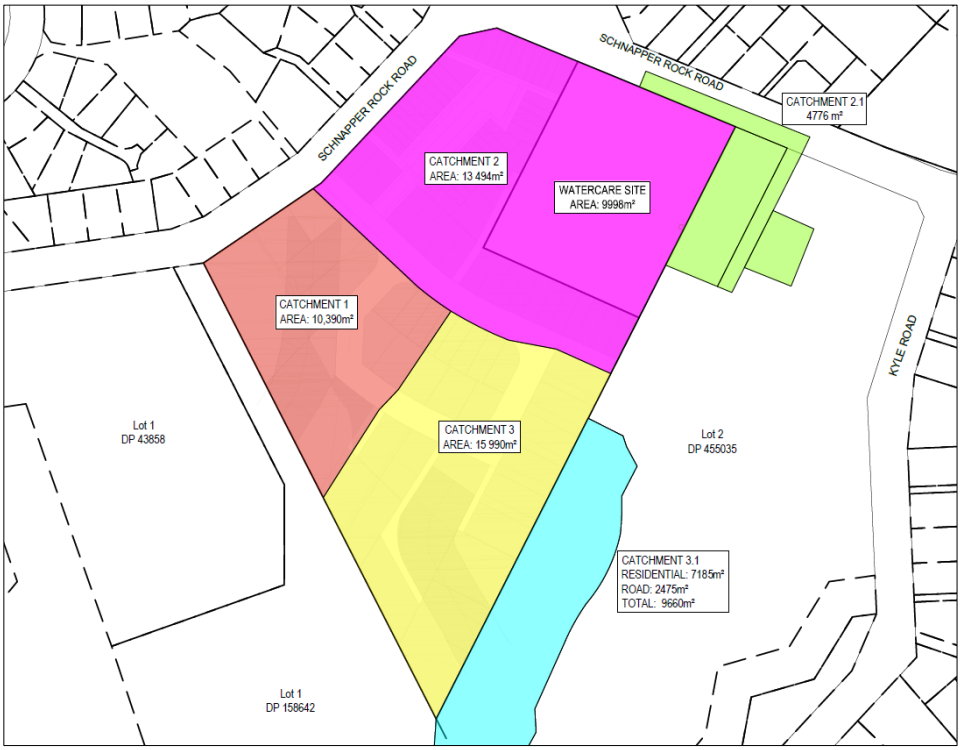


Figure 6: Stormwater Servicing Catchment Plan

Catchment 1

A new stormwater reticulation will be provided to capture impervious areas to be conveyed into the western stream. For residential lots located directly to the western gully, individual discharge outlet can be utilised through private ownership where a public connection becomes unfeasible.

Catchment 2

A 525Ø stormwater pipe will be provided by the adjoining subdivision which is approximately located along the midpoint of the Watercare Site. It is proposed to extend from the 525Ø along the eastern boundary towards the development site. Land owner approval will be required for the stormwater extension within the Watercare Site.

Catchment 3

A 300Ø stormwater pipe provided by the adjoining subdivision will be extended into the southern corner of the site. The new network will be extended to provide servicing for the catchment through a new reticulated network.

1.5 WATER

Well established water supply network is located vicinity of the site. An existing water pump station is also located within the eastern corner of the site. The Watercare Code of Practice for Land Development and Subdivision sets out the design principles for water supply and requires assessment against SNZPAS 4509:2008 NZ Fire Service Fire Fighting Water Supply Code of Practice.

The existing public network is shown below within Figure 7:

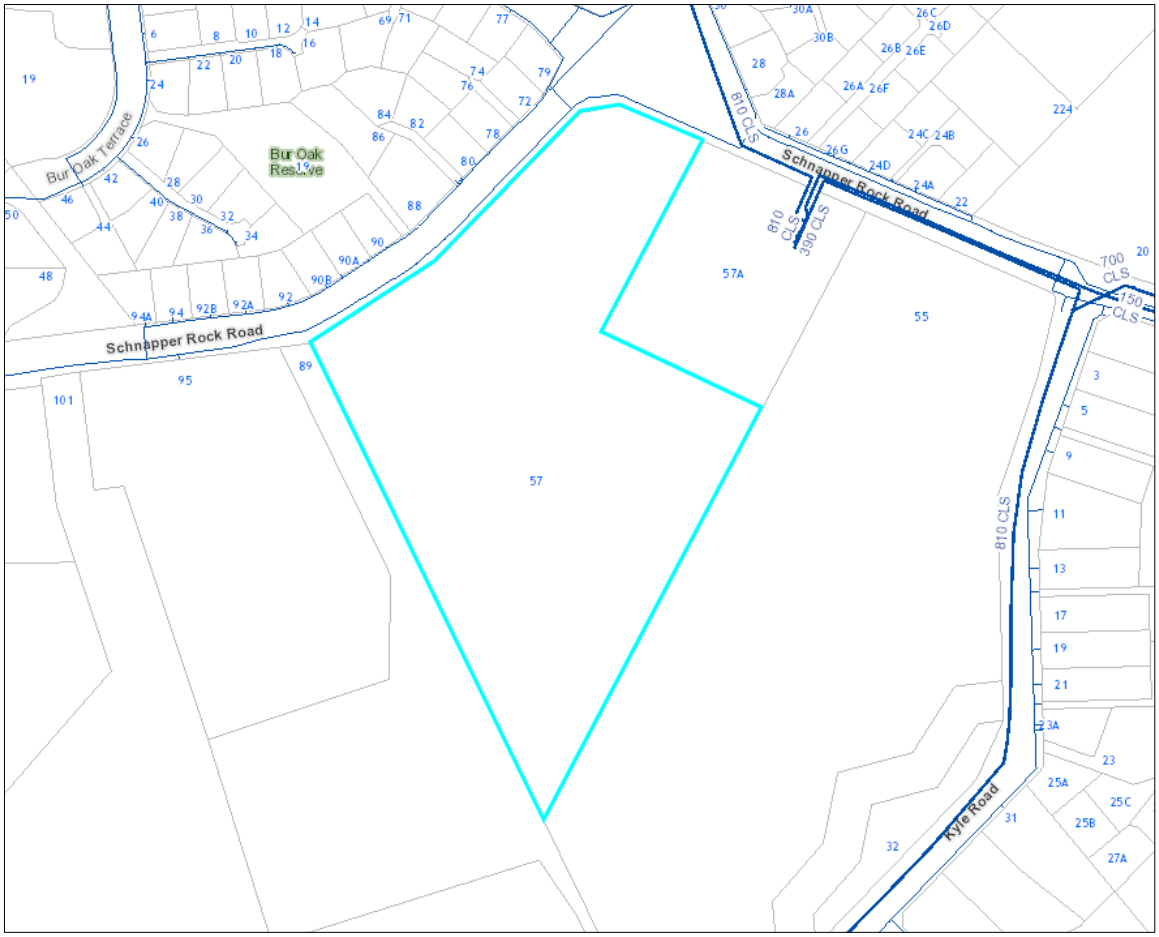


Figure 7: Existing watermain network. Source: GeoMaps

A 250PE water supply is located within the Schnapper Rock Road and the proposed development can be serviced via this existing water supply line.

Fire Hydrants shall be provided within the proposed internal water supply network to comply with the Fire Fighting Water Supply Code of Practice Services minimum distances.

3 UTILITIES

As built drawings received from “BeforeUdig” website shows power, telecom and gas services are available in vicinity of the site and service availability shall be sought from the utility providers as part of the development process.

4 CONCLUSION

Stormwater drainage including treatment and mitigation can be provided for the proposed residential development. Final stormwater detail design will require an Engineering Plan Approval and Building Consent for any for private drainage.

Wastewater drainage will be provided via either a Low-Pressure Sewer (LPS) system, a gravity extension through the adjacent subdivision to discharge into the Kyle Road pump station, or provision for a new pump station within the site. Final wastewater detailed design will require an Engineering Plan Approval and Building Consent for any for private drainage and subject to Watercare Services Ltd. approval.

Water supply infrastructure surrounding the site is considered sufficient for potable water supply and firefighting demand shall be incorporated for the proposed residential development design.

A telecommunications, gas and power networks are present in the surrounding area and services are available to service the proposed development.

The information gathered to-date confirms the existing services are suitable for the proposed residential development given the design are to be compliant with the Local authority code of practice standards.

APPENDIX A: CONCEPT PLAN

CONCEPT MASTER PLAN

KEY:

- Terrace Housing 36 (39%
- Zero-lot Line Detached Housing 32 (34%)
- Standard Detached Housing 25 (27%)

Total 93 (100%)

- Proposed Public Road (14.0m road reserve)
- Proposed Private Accessway
- Significant Ecological Area(protected land)
- Riparian Margin (protected land)

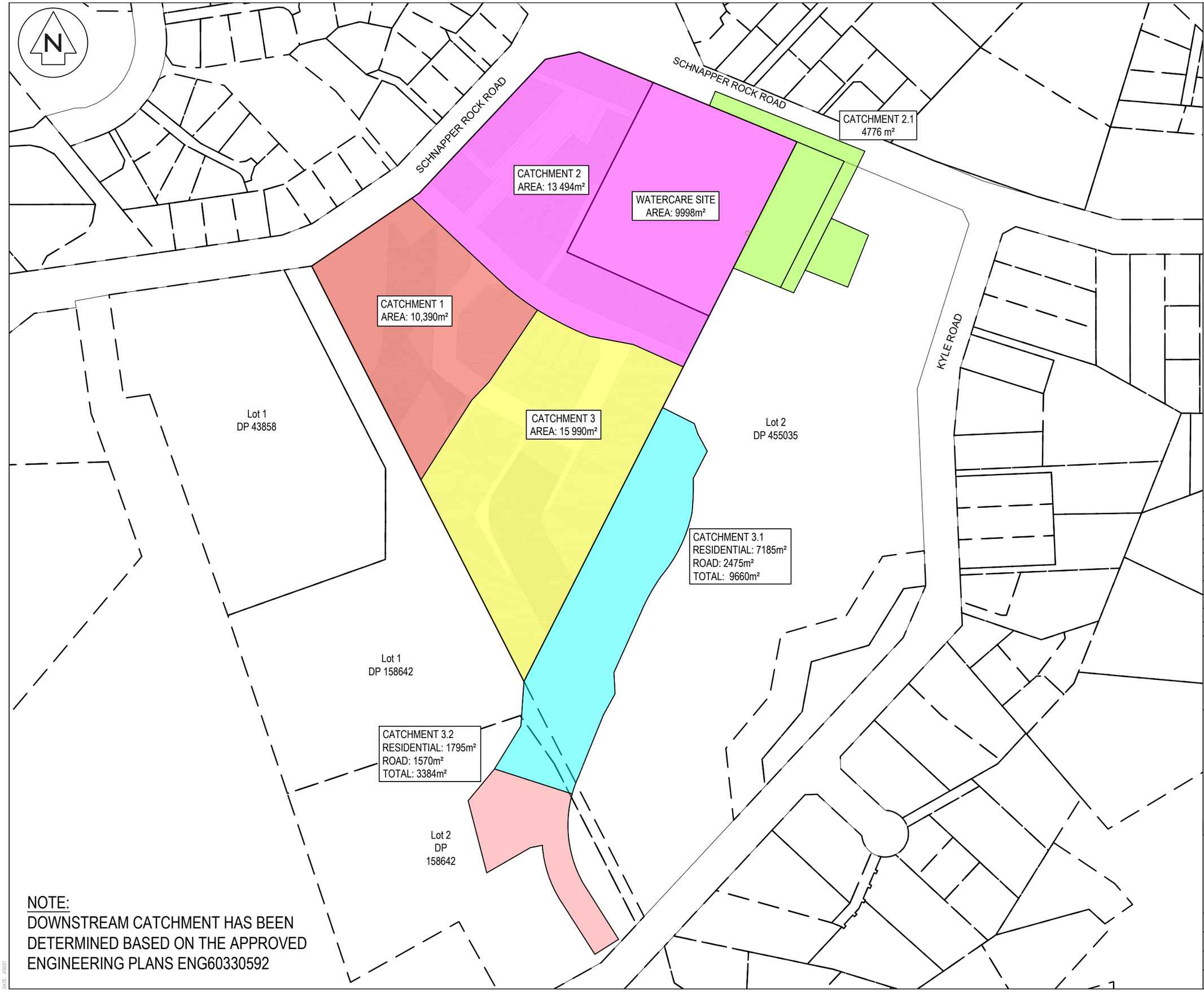
Note:

This site layout is conceptual only, and is subject to further investigations into Planning, Survey, Ecological and Engineering feasibility and may be derived from inaccurate source information. This is also subject to necessary approval from Auckland Council, Auckland Transport and Watercare.

53 SCHNAPPER ROCK ROAD, ALBANY

Project:	Schnapper Rock Road Dev 2020
Date:	21 December 2020
Status:	Draft
Scale:	1:2000 @ A3

APPENDIX B: CATCHMENT PLANS



NOTE:
DOWNSTREAM CATCHMENT HAS BEEN DETERMINED BASED ON THE APPROVED ENGINEERING PLANS ENG60330592

DATE: 4/30/21

Legend
EX BDY
PROP BDY

Rev	Description	By	Date
B	S92 CATCHMENT UPDATE	JD	04/21
A	PLAN CHANGE	AP	02/21

	By	Date
Survey	-	-
Design	AP	02/21
Drawn	AP	02/21
Checked	JD	02/21

Maven Associates
09 571 0050
info@maven.co.nz
www.maven.co.nz
5 Owens Road, Epsom
Auckland 1023

Project
57 SCHNAPPER ROCK RD
SCHNAPPER ROCK
DEVELOPMENT
FOR
KBS DESIGN GROUP LTD.

Title
PROPOSED
10 YEAR CATCHMENT
PLAN

Project no.	175006		
Scale	1:1500 @ A3		
Cad file	C450 - SW CAPACITY.DWG		
Drawing no.	C450	Rev	A

Rev	Description	By	Date
B	CAPACITY UPDATE	JD	02/21
A	INFORMATION ONLY	YG	10/20

	By	Date
Survey	BY	DATE
Design	YG	09/20
Drawn	YG	09/20
Checked	AC	09/20

Maven Associates
09 571 0050
info@maven.co.nz
www.maven.co.nz
12-14 Walls Road, Penrose

Project
57 SCHNAPPER ROCK ROAD ALBANY FOR KBS DESIGN GROUP LTD

Title
WASTEWATER CATCHMENT PLAN

Project no.	53SRR		
Scale	1:2500 @ A3		
Cad file	WW- CATCHMENT.DWG		
Drawing no.	C400	Rev	B

A	INFORMATION ONLY	YG	10/20
Rev	Description	By	Date

	By	Date
Survey	BY	DATE
Design	YG	09/20
Drawn	YG	09/20
Checked	AC	09/20

Maven Associates
09 571 0050
info@maven.co.nz
www.maven.co.nz
12-14 Walls Road, Penrose

Project
57 SCHNAPPER ROCK ROAD
ALBANY
FOR
KBS DESIGN GROUP LTD

Title
WASTEWATER CATCHMENT PLAN

Project no.	53SRR		
Scale	1:2500 @ A3		
Cad file	WW- CATCHMENT.DWG		
Drawing no.	C401	Rev	A

APPENDIX C: PLANNING ASSESSMENT AND CALS

Maven Associates	Job Number	Sheet	Rev
	175006	1	A

Job Title	57 Schnapper Rock Road	Author	Date	Checked
Calc Title	Wastewater Demand - 57 Schnapper Rock Rd	JD	8-Apr	AC

As per Watercare standards: 3 people per dwelling

PWWF = 1206 l/person/day

ks for uPVC = 0.6

Discharge Rates

Average dry weather flow = 180 litres/person/day

Peak dry weather diurnal flow = 540 litres/person/day

peak wet weather flow = 1206 litres/person/day

PROPOSED DEVELOPMENT

Population	Dwellings	People	Occupancy
Proposed	93	3	279
Total	93	3	279

Discharges	Persons	Rate l/p/day	Flow l/s
ADWF	279	180	0.58
PDWDF	279	540	1.74
PWWF	279	1206	**3.89**

TOTAL **3.89**

Maven Associates		Job Number 175006	Sheet 3	Rev A
Job Title	57 Schnapper Rock Road	Author	Date	Checked
Calc Title	Wastewater Demand - 57 Schnapper Rock Rd	JD	8-Apr	JP

As per Watercare standards: 3 people per dwelling

PWWF = 1206 l/person/day

ks for uPVC = 0.6

Discharge Rates

Average dry weather flow = 180 litres/person/day

Peak dry weather diurnal flow = 540 litres/person/day

peak wet weather flow = 1206 litres/person/day

CATCHMENT B - RESIDENTIAL PORTION

Population	Dwellings	People	Occupancy
Proposed	93	3	279
Existing	67	3	201
Total	160	3	480

Discharges	Persons	Rate l/p/day	Flow l/s
ADWF	480	180	1.00
PDWDF	480	540	3.00
PWWF	480	1206	**6.70**

TOTAL **6.70**

Maven Associates	Job Number	Sheet	Rev
	53SRR	1	A
Job Title: 53 Schnapper Rock Road Calc Title: Wastewater Demand - Kyle Rd Pump Stat.	Author: RK	Date: 21-Sep	Checked: JD

As per Watercare standards: 3 people per dwelling

PWWF = 1206 l/person/day

ks for uPVC = 0.6

Discharge Rates

Average dry weather flow = 180 litres/person/day

Peak dry weather diurnal flow = 540 litres/person/day

peak wet weather flow = 1206 litres/person/day

CATCHMENT B - RESIDENTIAL PORTION

Population	Dwellings	People	Occupancy
Proposed			
Existing	67	3	201
Total	67	3	201

Discharges	Persons	Rate l/p/day	Flow l/s
ADWF	201	180	0.42
PDWDF	201	540	1.26
PWWF	201	1206	**2.81**

TOTAL **2.81**

Maven Associates	Job Number	Sheet	Rev
	175006	2	A

Job Title	57 Schnapper Rock Road	Author	Date	Checked
Calc Title	Wastewater Demand - 57 Schnapper Rock Rd	JD	8-Apr	JP

As per Watercare standards: 3 people per dwelling

PWWF = 1206 l/person/day

ks for uPVC = 0.6

Discharge Rates

Average dry weather flow = 180 litres/person/day

Peak dry weather diurnal flow = 540 litres/person/day

peak wet weather flow = 1206 litres/person/day

CATCHMENT A - RESIDENTIAL PORTION

Population	Dwellings	People	Occupancy
Proposed	93	3	279
Existing	135	3	405
Total	228	3	684

Discharges	Persons	Rate l/p/day	Flow l/s
ADWF	684	180	1.43
PDWDF	684	540	4.28
PWWF	684	1206	**9.55**

TOTAL **9.55**

Maven Associates	Job Number	Sheet	Rev
	53SRR	1	A

Job Title	53 SCHNAPPER ROCK ROAD	Author	Date	Checked
Calc Title	Water Demand - 53 Schnapper Rock Rd	RK	25-Jan	JD

As per Watercare standards: 3 people per dwelling

Demand 250 l/person/day

Demand Rates

Average Demand = 250 litres/person/day

Peak Demand (5x) = 1250 litres/person/day

Population	Dwellings	People	Occupancy
Proposed Dwellings	90	3	270

Demand	Persons	Rate l/p/day	Flow l/s
AD Water	270	250	0.78
PD Water	270	1250	3.91

Peak Demand	Persons	Rate l/p/day	Flow l/s
PD Water	270	1250	**3.91**

Development Application Form – Water Supply/Wastewater Planning Assessment		
Date of Application	**25/04/21**	
Address of Development	**57 SCHNAPPER ROCK ROAD, SCHNAPPER ROCK ROAD**	
Layout Plan of Proposed Development clearly showing: • Aerial photograph • Road names • Boundary of development • Preferred point of connection to existing water supply and wastewater asset	See attached	
	Description	**Comment**
Current Land Use	Vacant	*Residential (Single family dwellings) / Residential (Multi-unit dwellings) / Residential (Multi-storey apartment blocks) / Commercial / Industrial / Other (Please Specify)*
Proposed Land Use	Residential (Single family dwellings)	
Total Development Area (Ha.)	*3.9889 Ha.*	
Number of Residential Households (Consent & Ultimate)	37 - Terrace Housing 28 - Zero-lot Line Detached Housing 25 - Standard Detached Housing	*E.g. 12- storey apartment building with 4 units per storey is 48 residential households.*

Refer to Water and Wastewater Code of Practice for Land Development and Subdivision Section 6 Water Supply

Water Supply Development Assessment		
Average and Peak Residential Demand (L/s)	AD = 0.78 PD = 3.91	*Show calculations based on Watercare CoP*
Average and Peak Non-Residential Demand (L/s)	-	*Show calculations based on Watercare CoP*
Non Residential Demand Typical Daily Consumption Profile / Trend	-	*E.g. 24 hr operation / 10 hr (9am – 5pm) / Filling on-site storage at certain frequency)*
Fire- fighting Classification required by the proposed site	FW2	*Refer to New Zealand Standard SNZ PAS 4509:2008*
Hydrant Flow Test Results	☐ Yes ☒ No	*Attach hydrant flow test layout plan and results showing test date & time; location of hydrants tested and pressure logged; static pressure; flow; residual pressure*
Sprinkler System in building?	☐ Yes ☒ No	*Sprinkler design should consider Watercare Level of Service: minimum pressure at 200kPa and minimum flow at 25 l/min. The building owner shall conduct periodic review of sprinkler design.*
Further Water Supply comments		

Refer to Water and Wastewater Code of Practice for Land Development and Subdivision Section 5 Wastewater

Wastewater Development Assessment		
Peak DWF and WWF Residential Design Flows (L/s)	PDWF = 1.74 PWWF= 3.89	*Show calculations based on Watercare CoP. If relevant for ultimate development scenario include No. of Potential Units/ lots for calculations.*
Peak DWF and WWF Non-Residential Design Flows (L/s)	-	*Show calculations based on Watercare CoP.*
Non-Residential Discharge Profile / Trend (i.e. Operations)	-	*E.g. 24 hr operation / 10 hr (9am – 5pm) / Other*
New Assets Required for Development		*If applicable please provide supporting calculations and indicative design parameters (ie. Pump Station and rising main or storage)*
Sewer Capacity Check (L/s)	Ex. Pump Station (Kyle Rd) =2.81	*Capacity assessment at proposed connection point and impact on network*
Further Wastewater comments		

For internal Watercare use only

Date Application Received	
Application Ref No.	
Assigned Connections Engineer	
Prior Developer Correspondence with Watercare	
Neighbouring developments to consider in capacity assessment	

APPENDIX D: 55 SCHNAPPER ROCK ROAD APPROVED EPA

Engineering Approval

- issued by Auckland Council - Regulatory Engineering Department

28 August 2020

HL Developments Albany Ltd & Golden Horse Land Development Ltd
C/o Cato Bolam Consultants Limited
PO Box 21-355
Henderson 0650

Attn: Amanda Crawford

Dear Amanda,

Re: Engineering reference number: ENG60330592
Applicant: HL Developments Albany Ltd & Golden Horse Land Development Ltd
Engineering Approval for 55 Schnapper Rock, Schnapper Rock
Description of works: Public stormwater, wastewater and water supply networks.

Please note: when communicating with Auckland Council regarding these works, please quote this approval reference number.

Approval is hereby granted to construct the works identified above subject to the following conditions:

Preamble:

The purpose of the approval process is to ensure that Council's vested infrastructure assets achieve acceptable levels of service. The standards used for this purpose are:

- Auckland Council Code of Practice for Land Development and Subdivision (CoP);
  Chapter 2 – Earthworks and Geotechnical Requirements (v1.6 - Sept 2013)
  Chapter 3 – Auckland Transport Code of Practice (ATCoP) 2013
  Chapter 4 – Stormwater (v2.0 - Nov 2015)
  Chapter 5 – Wastewater
  Chapter 6 – Water supply
  Latest versions of the Code of Practice can be found on the Auckland Council website under the Auckland Design Manual section.

- Relevant NZ standards relating to the works, the details of which may not be covered by the CoP.

The approval does not by itself relieve the approval holder the responsibility and obligation to ensure that the design and completed works are fit for purpose.

General conditions:

1) The public stormwater and wastewater extension works shall be carried out in accordance with the attached annotated plans (noted below) and associated calculations and specifications, prepared by Tripp Andrews Surveyors Limited and Auckland Council specifications and standards as identified in the Auckland Council Code of Practice and the conditions below.

Table of relevant plan numbers and amendments

Drawing title	Reference	Revision	Date
Combined Drainage Reticulation Overall Layout	41351-DR-C-4000	G	06/07/2020
Wastewater Reticulation Overall Layout	41351-DR-C-4001	F	06/07/2020
Wastewater Reticulation Sheet 1	41351-DR-C-4002	E	06/07/2020
Wastewater Reticulation Sheet 2	41351-DR-C-4003	E	06/07/2020
Wastewater Reticulation Sheet 3	41351-DR-C-4004	D	06/07/2020
Wastewater Longsections Sheet 1 of 2	41351-DR-C-4100	C	06/07/2020
Wastewater Longsections Sheet 2 of 2	41351-DR-C-4101	C	06/07/2020
Stormwater Layout Overall Plan	41351-DR-C-5000	F	22/06/2020
Stormwater Layout Sheet 1 of 4	41351-DR-C-5001	E	22/06/2020
Stormwater Layout Sheet 2 of 4	41351-DR-C-5002	C	22/06/2020
Stormwater Layout Sheet 3 of 4	41351-DR-C-5003	C	22/06/2020
Stormwater Layout Sheet 4 of 4	41351-DR-C-5004	C	22/06/2020
Stormwater Longsections Sheet 1 of 12	41351-DR-C-5100	C	17/06/2020
Stormwater Longsections Sheet 2 of 12	41351-DR-C-5101	C	17/06/2020
Stormwater Longsections Sheet 3 of 12	41351-DR-C-5102	F	17/06/2020
Stormwater Longsections Sheet 4 of 12	41351-DR-C-5103	E	17/06/2020
Stormwater Longsections Sheet 5 of 12	41351-DR-C-5104	D	17/06/2020
Stormwater Longsections Sheet 6 of 12	41351-DR-C-5105	D	17/06/2020
Stormwater Longsections Sheet 7 of 12	41351-DR-C-5106	C	17/06/2020
Stormwater Longsections Sheet 8 of 12	41351-DR-C-5107	C	17/06/2020
Stormwater Longsections Sheet 9 of 12	41351-DR-C-5108	D	17/06/2020
Stormwater Longsections Sheet 10 of 12	41351-DR-C-5109	C	17/06/2020
Stormwater Longsections Sheet 11 of 12	41351-DR-C-5110	C	17/06/2020
Stormwater Longsections Sheet 12 of 12	41351-DR-C-5111	C	17/06/2020
Rain Garden Typical Details Raingarden 11 – Drive 2	41351-DR-C-5603	B	22/06/2020
Stormwater Bypass Detail (Line K – longsection) & Manhole Details	41351-DR-C-5700	C	17/06/2020
Stream Stormwater Outlet Details	41351-DR-C-5701	C	19/06/2020
Stormwater Outlet Detail Lines B & D	41351-DR-C-5702	B	19/06/2020
Stormwater Outlet Detail Lines E & G	41351-DR-C-5703	B	19/06/2020
Stormwater Pipe Support & Dispersal T-Bar Details	41351-DR-C-5800	C	22/06/2020
Water Reticulation Overall Layout	41351-DR-C-6000	E	03/07/2020
Water Reticulation Sheet 1	41351-DR-C-6001	D	03/07/2020
Water Reticulation Sheet 2	41351-DR-C-6002	D	03/07/2020
Water Reticulation Sheet 3	41351-DR-C-6003	D	03/07/2020

2) This approval is valid for a period of 12 months from this date and will lapse on 2 September 2021 unless a pre-construction meeting has been held and construction commenced. Extensions to this approval may be granted if requested.

3) All construction and conditions within this approval are to be completed within ***24*** months of the approval date.

4) All works shall be carried out in accordance with the following associated reports, agreements and approved consents:

    - Resource consent **BUN10628172**

5) Copies of all relevant consents and approvals, and associated specifications, reports and supporting documents are to be kept on site and available at all times.

6) Any works or access requirements which will affect adjacent neighbouring properties, including Council owned properties i.e. parks, reserves and accessways, shall have the owners written consent, before works commence.

7) All testing information and documentation is to be made available on request by Council's development engineer. Information may include (but is not limited to) benklemen beam test results, scala penetrometer records, compaction certificates and product and material supply dockets.

8) All works are to be undertaken and supervised by suitably qualified and experienced practitioners (SQEPs) carrying appropriate insurances. Evidence shall be provided at the pre-construction meeting prior to the commencement of the physical works.

Observation and Completion Documentation Conditions:

Advice note:
Auckland Council – Regulatory Engineering is the point of contact for the compliance aspects of the stormwater, roading and parks aspects. Watercare Services Limited is your point of contact for water and wastewater aspects. Where approvals cover assets from both groups, the pre-construction meeting shall be organised through Regulatory Engineering. The following conditions will guide you on the process to achieve compliance.

9) Progress observations for stormwater, roading and/or parks shall be arranged with Council's Development Engineer in line with Auckland Council's "Development Engineering Quality Assurance Manual – 2016".

10) **Stormwater Pre-Constuction:**

The Developer's Representative shall give Council's Development Engineer at least **5** working days' notice of the on-site **pre-construction meeting**. Construction work shall not commence on the site until such meeting has been held and all necessary documentation is presented as follows, but not limited to;

- The stamped Engineering Approval plans
- Health and Safety Plan (in order for the development engineer to understand how they need to comply while onsite);
- The Signed Corridor Access Request (and TMP where required)
- Services location and identification details by specific utility providers.
- The relevant Resource or Subdivision Consent (and all conditions attached thereto);
- A programme of works detailing specific inspection milestones.
- Any signed Consents to Enter for Construction for works on land (including Council land) not owned by the consent holder.

Note: Any variation or changes to the approved engineering plans shall be submitted for approval as an Amendment and approval received thereto prior to construction of the varied works.

Note:
To contact your Development Engineer to discuss your project or arrange inspections you can contact Greg Hall on 021 523 189 or email Greg.Hall@aucklandcouncil.govt.nz.

11) **Wastewater & Water Supply Pre-Construction:**

The Developer's Representative shall give Watercare's Engineer at least **5** working days' notice of the on-site **pre-construction meeting**. You can arrange the pre-construction meeting by emailing compliance@water.co.nz with the details of your Engineering approval. Construction work shall not commence on the site until such meeting has been held and Watercare have confirmed that the works can proceed.

- The stamped Engineering Approval plans
- Health and Safety Plan (in order for Watercare's engineer to understand how they need to comply while onsite);
- The Signed Corridor Access Request (and TMP where required)
- Services location and identification details by specific utility providers.
- The relevant Resource or Subdivision Consent (and all conditions attached thereto);
- A programme of works detailing specific inspection milestones.
- Any signed Consents to Enter for Construction for works on land (including Council land) not owned by the consent holder.

Note: Any variation or changes to the approved engineering plans shall be submitted to Auckland Council – Regulatory Engineering for approval as an "Amendment" and approval received thereto prior to construction of the varied works.

Note:
You can arrange the pre-construction meeting by emailing compliance@water.co.nz with the details of your Engineering approval.

12) As-built plans and documentation (including CCTV pipe inspections) in accordance with Auckland Council's "Regulatory Engineering As-built requirements – 2018" are to be provided to Council's Development Engineer for approval. Required documents include:
    - Digital as-built plans in dxf/dwg format
    - Certified signed pdf as-built plans
    - Statement of Certification: Engineering approval
    - Schedule of Land and Assets to Vest
    - Schedule of Abandoned Assets
    - CCTV pipe inspections
    - RAMM data sheets
    - All test and inspection results (e.g. Benklemen beam/scala penetrometer results, Copies of QAM inspection sheets).

13) A final inspection is to be carried on site with all appropriate personnel. This includes the Developer's representative, Development Engineer and representatives from Council's asset groups (where required). As-built documentation in accordance with Auckland Council's "Regulatory Engineering As-built requirements - 2018" shall be made available a minimum of 5 days prior to the inspection.

Stormwater:

14) Overland and Secondary Flow Paths.
    As-built information shall be provided for catchments exceeding 4000m2 (DEAR requirement) and for any lesser catchment for which an easement is required or proposed. Where flow paths through lots are unavoidable, minimum floor levels must be established and plans provided suitable to link to a Consent Notice or Property Characteristics register.

15) Connections to live stormwater reticulations shall only be by a Registered Drainlayer/Contractor acquainted and experienced with the current standards of Auckland Council for public stormwater systems. The Drainlayer must contact the DE to inspect the proposed connection at least two days of the expected date of connection to any existing reticulation.

16) Stormwater manhole throats shall be painted blue. Covers shall not be painted.

17) CCTV inspections
    Prior to testing of the completed services, lines shall be flushed out. Debris shall not be flushed into any existing downstream reticulation. CCTV inspection shall then be arranged for all public stormwater pipes, any leads outside the served lot, whether public or private, and also the under drains of bio-filtration devices such as rain gardens. The work will be at the consent holder's cost. Any remedial works that may arise will be the responsibility of the Consent Holder.
    The Consultant acting for the consent holder is to sign the final CCTV logs, confirming that the CCTV video has been viewed and the pipeline meets the standards of Council; and forward the DVD and logs to the Development Engineer.

18) Stormwater connections shall be appropriately sized class X (minimum) concrete or uPVC (AS/NZS 1260 1999) (SN16 minimum) classification, taken a minimum 1000mm inside the boundary of the lots. The minimum diameter of a lot connection is 100mm. Endcaps shall be painted blue.

19) Provide safety fences at outfall and similar structures with vertical drops exceeding 1m. Provide safety chains where manhole outlets are 600mm or greater. Where supported by a risk assessment, safety grills shall be installed under covers.

20) Any stormwater reticulation which are approved on the annotated plans as “private drain” or “common private drain” will require as easement for the construction and maintenance and replacement of the drains by the landowners jointly or severally responsible.

Wastewater and water:

21) The construction of water/wastewater infrastructure to vest in Auckland Council (and then in Watercare) on completion (public water supply/wastewater works) must comply with the requirements of the current Code of Practice, as well as Watercare’s standards for material supply, construction and asset data capture.

22) The public water supply/wastewater works must comply with Watercare’s requirements in the attached Watercare Review letter date 30 July 2020.

23) The public water supply/wastewater works must comply with Watercare’s requirements in accordance with Watercare’s Compliance Statement Policy, Part 1 for Land Development and Subdivision Works.

24) All connections/disconnections to Watercare water/wastewater networks must be made in accordance with Watercare’s connection processes and must comply with the current Code of Practice.

25) All wastewater stubs for service connections must be constructed with new public wastewater reticulation main extensions and provided with end cap and marker post within each lot boundary. Watercare approval is required before any service connection is made on the wastewater stub.

Advice notes:

a) Under the Bylaw Watercare may refuse to accept the vesting of any infrastructure not completed in accordance with the conditions above.

b) The public water supply/wastewater works detailed on the Watercare review shall be constructed at no cost to Watercare. The submitted proposed plans must be based on actual site verification of the existing public wastewater drains and watermains.

c) All works on existing public wastewater drains and watermains (including connections and disconnections) shall be carried out only by a Watercare approved contractor at the applicant’s expense.

d) All works in close proximity to existing public wastewater drains and watermains will require a "works over" approval from Watercare.

e) Watercare approval is required before any individual building / lot is connected to the public water and/or wastewater network. An application for new connection shall be submitted to Watercare in conjunction with the application to Council for building consent.

f) Watercare infrastructure growth charges will apply to all new developments. Details of the charge are available on the website, watercare.co.nz.

g) A minimum 1.2 metres is required from the soffit level of the public wastewater drain to the lowest floor level.

h) Adequate provision must be made for the protection of public watermain from any proposed network utility service. This will include locating all watermain, hydrants, valves and tees before work begins.

i) All water supply leads for service connections must be constructed with the new public water supply reticulation main extensions as per Watercare standard drawing number WS13 or WS14 as appropriate. The meter installation must be carried out by a Watercare approved contractor.

j) All new public water supply reticulation main extensions cannot be connected to the live public system until all water supply leads for service connections are completed.

k) Mixed-used development shall have two (2) separate bulk water meters, one (1) to service the residential units and one (1) to service the commercial units.

l) The granting of this application does not constitute a guarantee from Watercare Services Limited to provide a fire fighting capability in accordance with Fire and Emergency New Zealand Code of Practice.

m) Water pressure could change in the future. To comply with FW2 fire risk classification, the installation of a sprinkler system and/or booster pump may be required for commercial, industrial high-rise and mixed-use buildings.

General advice notes:

1) If the applicant wishes to extend the duration of this EPA, they shall contact the undersigned engineer to request consideration.

2) The applicant is advised that a Traffic Management Plan (TMP) in accordance with the NZTA Code of Practice for Temporary Traffic Management (COPTTM) will be required for the proposed works. No works are to commence within the road reserve until an approved TMP has been issued by Auckland Transport.

3) All work within the legal road corridor (boundary to boundary) requires a 'Corridor Access Request (CAR) approved by Auckland Transport.
Note that an application for a CAR is made online to www.beforeudig.co.nz where relevant background details are required including resource consents, traffic management plans etc. A CAR may require up to 15 days to process and construction hours may be restricted on certain roads.

4) This approval does not grant rights to the Approval Holder to enter into private land to undertake works. It is the responsibility of the Approval Holder to obtain the approval of relevant property owners and tenants in advance of works commencing.

5) The Approval holder is advised that this approval does not obviate the need to obtain building consents for private drainage and structures associated with the provision of infrastructure services.

6) In addition to the charge for this approval, an engineering administration and inspection charge, relating to the engineering requirements will be applicable by determining all reasonable and actual costs incurred by Council to process and manage this approval.

Yours faithfully

Greg Hall
SENIOR DEVELOPMENT ENGINEER
REGULATORY ENGINEERING
Greg.Hall@AucklandCouncil.govt.nz
Phone 09 892 4214 | Mobile 021 523 189

Attachments:

1. Approved drawings
2. Watercare review

Drainage Legend

Existing		Proposed
	Wastewater - PWC	
WW	PWC Wastewater (Ø)	63
FP	Flushing Pit	FP
	Isolation Valve	
	Air Release Valve	
	Reducer	
	Bdy Kit (single)	
	Bdy Kit (double)	
	Blank Cap	
	Wastewater - Gravity	
WW	WW line	
	WW manhole	
	Stormwater	
SW	SW line	
	SW manhole	
	Cesspit	
	Outlet/Inlet	
	Raingarden	
	Grassed Swale	
	Dispersal T-Bar	

Watercare
An Auckland Council Organisation

Network Extension Peer Review

Application Number: EPA-6712

Approved By: Amir Karimi

Date: 30/07/2020

This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

N

Schnapper Rock Road

Kyle Road

Albertine Place

Drive 1

Drive 1A

Drive 2

Drive 3

Drive 4

Drive 5

Road 2

Road 2A

1
DP 455035

Private pressurised system to be used for lot 9-17 if free-board is less than 1m.

Private pipes. under body corporate

A bulk point installation shall be used with individual private boundary kits located inside the property. All the pipes and boundary kits after bulk point remains private. A body corporate (or similar legal instrument) arrangement required.

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

EX WW MH 1/1
Lid 68.42
Inv 66.09

EX MH
Lid 64.01
Drop 62.50
ILin 61.82
ILin 62.17
ILout 61.81

EX MH
Lid 63.58
ILin 62.5
ILout 62.28

EX MH
Lid 26.90
Inv 23.70

EX Pump Station

150Ø EW (GIS) SS

Extg 150Ø SS

150 EW SS

160 PE (GIS) SS

Rising main 100 PE (GIS) WW

201 Pedestrian Accessway

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
D	Issued for EPA	AC	19/11/19
E	Swales removed & CP edits	AC	31/03/2020
F	line 5 added conn to bdy, MH 1/7 moved	AC	26/04/2020
G	Gravity align & Drive 1 & 5 PWC edits	AC	06/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	1:1500	A3

DRAWING NO. 41351-DR-C-4000

REVISION G

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Combined Drainage Reticulation
Overall Layout

WASTEWATER

1. All pipes 200mm diameter or less are to be uPVC AS/NZSS 1260 Solid Wall SN16 unless otherwise shown.
2. All thrusted pipes are to be PE80 SDR17. All diameters are minimum inside diameters.
3. Bedding Details as per Standard Detail WW3
4. Manholes and chambers in traffic areas are to be heavy duty as per Standard Details WW35 - WW40.
5. All Wastewater manholes shall be fitted with a safety grille as per Watercare Services Ltd Standard Details WW35 - WW40.
6. All service connections are to be ramped to within 1.2m of finished level. Connections shall terminate with a factory sealed stopper and marked with a 50mm x 50mm H4 Treated Stake painted red.
7. Hardfill be placed where pipelines cross or where lines cross carriageways or trafficable areas.
8. Pipe Crossings - Hardfill Backfill. If clearance between pipes is less than 150mm, 55mm thick Polystyrene shall be placed against the underside of the pipe. Where clearance is less than 300mm the bell jointed pipes are used, there shall be no joints directly over the stormwater line.
9. All manholes 1050mm Ø flanged base concrete riser unless otherwise shown and installed in accordance with Watercare Services Ltd Standard Details. Single riser up to 2.4m shall be used.
10. Drops through manholes as per Watercare Services Ltd Standard Details.
11. Drainage Trenches to be backfilled with compacted clay or hardfill as directed to Engineers requirements.

PWC WASTEWATER RETICULATION

1. All PWC mains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for PWC reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All pipes and fittings shall be to a minimum specification of PE100 PN16 in relation to the pipe grading, with electro-fusion jointing.
4. Construction with Polyethylene pipelines shall be carried out in accordance with AS 2033 and AS/NZS2566.
5. All fittings shall be in accordance with AS/NZS 4129 (Int) Fittings for Polyethylene Pipes for pressure applications.
   - The Contractor must liaise with Council's supervisors regarding inspection of flanged joints.
6. Marker tape with the words "PWC pipe" shall be provided 300mm above all wastewater pressure pipe.
7. A tracer wire that is capable of being energised is to be laid with the pipeline trench at a similar level to the pipe.

Watercare
An Auckland Council Organisation
Network Extension Peer Review
Application Number: EPA-6712
Approved By: Amir Karimi
Date: 30/07/2020
This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

1
DP 455035

Schnapper Rock Road
Kyle Road
Albertine Place
Drive 1
Drive 1A
Drive 2
Drive 3
Drive 4
Drive 5
Road 2
Road 2A
Pedestrian Accessway
Rising main 100 PE (GIS)
150Ø EW (GIS)
Exist 150Ø SS
EX WW MH 1/1
Lid 68.42
Inv 66.09
EX MH
Lid 64.01
Drop 62.50
ILin 61.82
ILin 62.17
EX MH ILout 61.81
Lid 63.58
ILin 62.5
ILout 62.28
EX MH
Lid 26.90
Inv 23.70
160 PE (GIS)
EX Pump Station

Wastewater Legend

Existing	PWC	Proposed
WW	PWC Wastewater (Ø)	63
FP	Flushing Pit	FP
	Isolation Valve	
	Air Release Valve	
	Reducer	
	Bdy Kit (single)	
	Bdy Kit (double)	
	Blank Cap	
	Gravity	
WW	Wastewater	

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
C	Wastewater Layout Change	HT	21/10/19
D	Issued for EPA	AC	19/11/19
E	line 5 added conn to bdy, MH 1/7 moved	AC	26/04/2020
F	Gravity align& Drive 1 & 5 PWC edits	AC	06/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	1:1500	A3

DRAWING NO. 41351-DR-C-4001
REVISION F

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Reticulation
Overall Layout

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

N

Schnapper Rock Road

150mm duct under drive

1/10 150Ø 40.9m

PWC - Gravity shallow MH's as per Watercare SD WW18 (private)

6 x 40mm individual lot risingmain connections (Private) (lots 1-5 & 7)

100mm ducts under drive

Drive 1

Drive 1A

Drive 2

40mm individual lot risingmain connection (Private) (lot 6)

Diagram C Sheet 4004

1/9 150Ø 3.8m

3/1 150Ø 5.2m

4/1 150Ø 38.7m

1/8 150Ø 26.6m

1/7 150Ø 39.1m

1/6 150Ø 31.4m

1/5 150Ø 34.8m

1/4 150Ø 29.6m

1/3 150Ø 9.3m

1/2 150Ø 12.3m

2/1

Private pressurised system to be used for lot 9-17 if free-board is less than 1m.

Lots 9-17 where connection does not comply with WS17 then WS18 is to apply & will be installed at building consent stage

3 x bdy kits to serve lots 18, 19 & 21

3x 40mm individual lot connections (Private) lots 18, 19 & 21

Diagram B Sheet 4004

EX WW MH 1/1
Lid 68.42
Inv 66.09

PWC - Gravity MH as per Watercare SD WW19 (public)

Kyle Road

150Ø EW (GI)

Extg 150Ø 49.3m

EX MH
Lid 64.01
Drop 62.50
ILin 61.82
ILin 62.17
ILout 61.81

EX MH
Lid 63.58
ILin 62.5
ILout 62.28

EX MH
Lid 61.47

150 EW SS

201 Pedestrian Accessway

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 27 28 29 30 300 301

Watercare
An Auckland Council Organisation

Network Extension Peer Review

Application Number: EPA-6712

Approved By: Amir Karimi

Date: 30/07/2020

This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

Wastewater Legend

Existing	PWC	Proposed
WW	PWC Wastewater (Ø)	63
FP	Flushing Pit	FP
	Isolation Valve	
	Air Release Valve	
	Reducer	
	Bdy Kit (single)	
	Bdy Kit (double)	
	Blank Cap	
	Gravity	
WW	Wastewater	

WASTEWATER

1. All pipes 200mm diameter or less are to be uPVC AS/NZSS 1260 Solid Wall SN16 unless otherwise shown.
2. All thrusted pipes are to be PE80 SDR17. All diameters are minimum inside diameters.
3. Bedding Details as per Standard Detail WW3
4. Manholes and chambers in traffic areas are to be heavy duty as per Standard Details WW35 - WW40.
5. All Wastewater manholes shall be fitted with a safety grille as per Watercare Services Ltd Standard Details WW35 - WW40.
6. All service connections are to be ramped to within 1.2m of finished level. Connections shall terminate with a factory sealed stopper and marked with a 50mm x 50mm H4 Treated Stake painted red.
7. Hardfill be placed where pipelines cross or where lines cross carriageways or trafficable areas.
8. Pipe Crossings - Hardfill Backfill. If clearance between pipes is less than 150mm, 55mm thick Polystyrene shall be placed against the underside of the pipe. Where clearance is less than 300mm the bell jointed pipes are used, there shall be no joints directly over the stormwater line.
9. All manholes 1050mm Ø flanged base concrete riser unless otherwise shown and installed in accordance with Watercare Services Ltd Standard Details. Single riser up to 2.4m shall be used.
10. Drops through manholes as per Watercare Services Ltd Standard Details.
11. Drainage Trenches to be backfilled with compacted clay or hardfill as directed to Engineers requirements.

PWC WASTEWATER RETICULATION

1. All PWC mains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for PWC reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All pipes and fittings shall be to a minimum specification of PE100 PN16 in relation to the pipe grading, with electro-fusion jointing.
4. Construction with Polyethylene pipelines shall be carried out in accordance with AS 2033 and AS/NZS2566.
5. All fittings shall be in accordance with AS/NZS 4129 (Int) Fittings for Polyethylene Pipes for pressure applications.
   - The Contractor must liaise with Council's supervisors regarding inspection of flanged joints.
6. Marker tape with the words "PWC pipe" shall be provided 300mm above all wastewater pressure pipe.
7. A tracer wire that is capable of being energised is to be laid with the pipeline trench at a similar level to the pipe.

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision layout changed	AC	09/08/19
C	Wastewater Layout Change	HT	21/10/19
D	line 5 added conn to bdy, MH 1/7 moved	AC	26/04/2020
E	Gravity align & Drive 1 & 5 PWC edits	AC	06/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	1:1000	A3

DRAWING NO. 41351-DR-C-4002 REVISION E

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Reticulation
Sheet 1

WASTEWATER

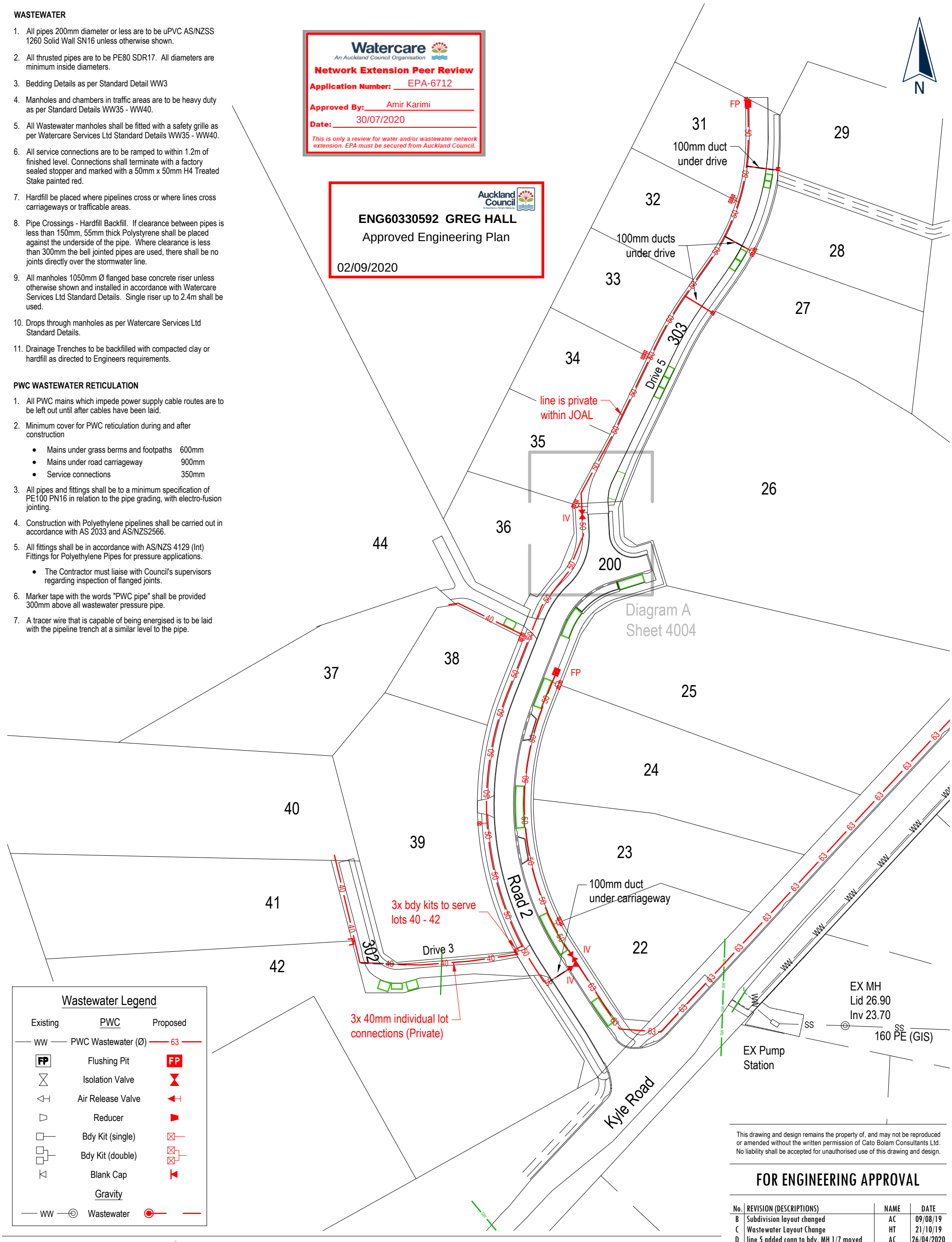
1. All pipes 200mm diameter or less are to be uPVC AS/NZSS 1260 Solid Wall SN16 unless otherwise shown.
2. All thrusted pipes are to be PE80 SDR17. All diameters are minimum inside diameters.
3. Bedding Details as per Standard Detail WW3
4. Manholes and chambers in traffic areas are to be heavy duty as per Standard Details WW35 - WW40.
5. All Wastewater manholes shall be fitted with a safety grille as per Watercare Services Ltd Standard Details WW35 - WW40.
6. All service connections are to be ramped to within 1.2m of finished level. Connections shall terminate with a factory sealed stopper and marked with a 50mm x 50mm H4 Treated Stake painted red.
7. Hardfill be placed where pipelines cross or where lines cross carriageways or trafficable areas.
8. Pipe Crossings - Hardfill Backfill. If clearance between pipes is less than 150mm, 55mm thick Polystyrene shall be placed against the underside of the pipe. Where clearance is less than 300mm the bell jointed pipes are used, there shall be no joints directly over the stormwater line.
9. All manholes 1050mm Ø flanged base concrete riser unless otherwise shown and installed in accordance with Watercare Services Ltd Standard Details. Single riser up to 2.4m shall be used.
10. Drops through manholes as per Watercare Services Ltd Standard Details.
11. Drainage Trenches to be backfilled with compacted clay or hardfill as directed to Engineers requirements.

PWC WASTEWATER RETICULATION

1. All PWC mains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for PWC reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All pipes and fittings shall be to a minimum specification of PE100 PN16 in relation to the pipe grading, with electro-fusion jointing.
4. Construction with Polyethylene pipelines shall be carried out in accordance with AS 2033 and AS/NZS2566.
5. All fittings shall be in accordance with AS/NZS 4129 (Int) Fittings for Polyethylene Pipes for pressure applications.
   - The Contractor must liaise with Council's supervisors regarding inspection of flanged joints.
6. Marker tape with the words "PWC pipe" shall be provided 300mm above all wastewater pressure pipe.
7. A tracer wire that is capable of being energised is to be laid with the pipeline trench at a similar level to the pipe.

Watercare
An Auckland Council Organisation
Network Extension Peer Review
Application Number: EPA-6712
Approved By: Amir Karimi
Date: 30/07/2020
This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020



Wastewater Legend

Existing	PWC	Proposed
WW	PWC Wastewater (Ø)	63
FP	Flushing Pit	FP
	Isolation Valve	
	Air Release Valve	
	Reducer	
	Bdy Kit (single)	
	Bdy Kit (double)	
	Blank Cap	
	Gravity	
WW	Wastewater	

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision layout changed	AC	09/08/19
C	Wastewater Layout Change	HT	21/10/19
D	line 5 added conn to bdy, MH 1/7 moved	AC	26/04/2020
E	Drive 5 PWC edits	AC	06/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	1:1000	A3

DRAWING NO.	REVISION
41351-DR-C-4003	E

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Reticulation
Sheet 2

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

Watercare
An Auckland Council Organisation

Network Extension Peer Review

Application Number: EPA-6712

Approved By: Amir Karimi

Date: 30/07/2020

This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

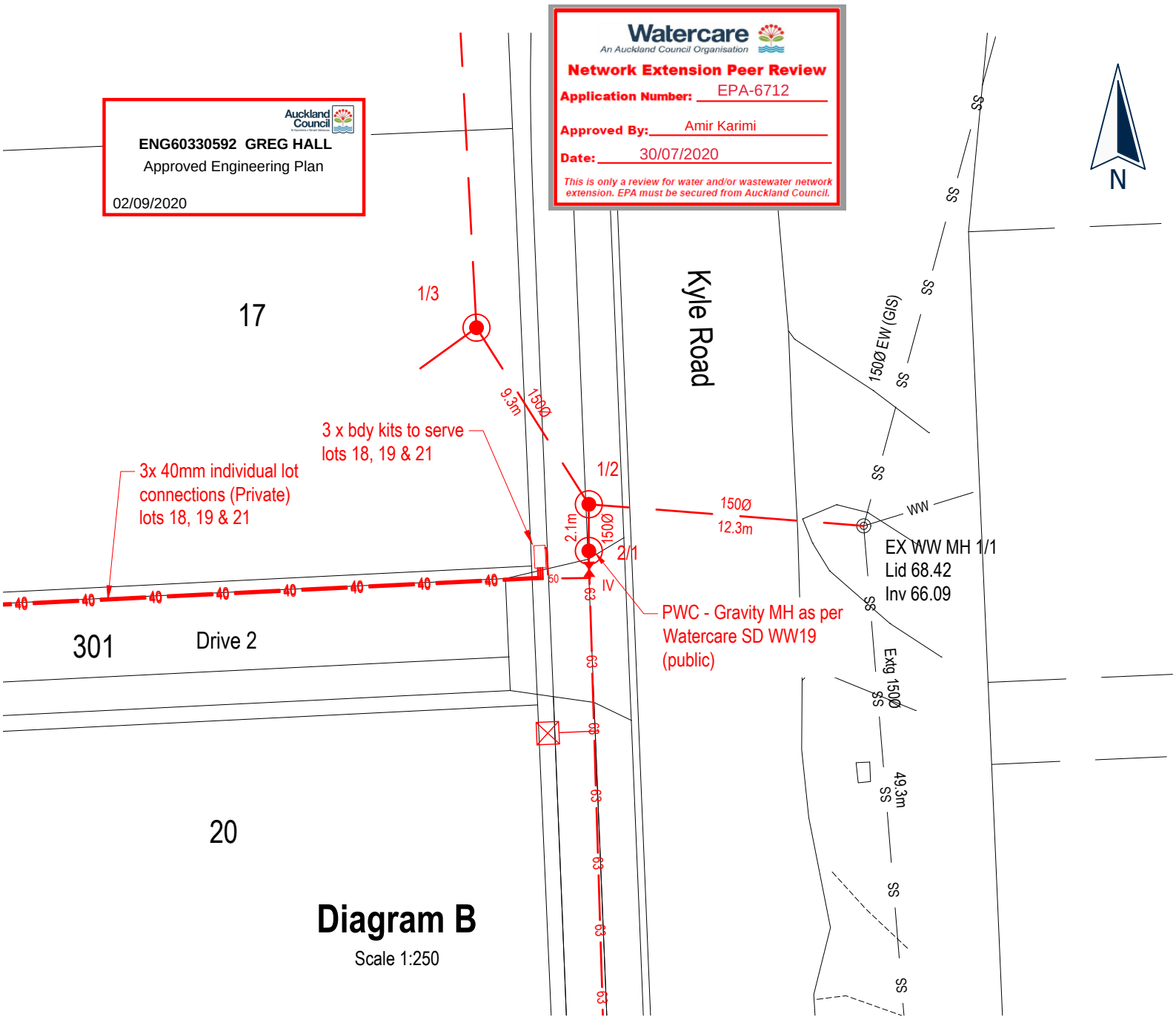


Diagram B

Scale 1:250

WASTEWATER

1. All pipes 200mm diameter or less are to be uPVC AS/NZSS 1260 Solid Wall SN16 unless otherwise shown.
2. All thrusted pipes are to be PE80 SDR17. All diameters are minimum inside diameters.
3. Bedding Details as per Standard Detail WW3
4. Manholes and chambers in traffic areas are to be heavy duty as per Standard Details WW35 - WW40.
5. All Wastewater manholes shall be fitted with a safety grille as per Watercare Services Ltd Standard Details WW35 - WW40.
6. All service connections are to be ramped to within 1.2m of finished level. Connections shall terminate with a factory sealed stopper and marked with a 50mm x 50mm H4 Treated Stake painted red.
7. Hardfill be placed where pipelines cross or where lines cross carriageways or trafficable areas.
8. Pipe Crossings - Hardfill Backfill. If clearance between pipes is less than 150mm, 55mm thick Polystyrene shall be placed against the underside of the pipe. Where clearance is less than 300mm the bell jointed pipes are used, there shall be no joints directly over the stormwater line.
9. All manholes 1050mm Ø flanged base concrete riser unless otherwise shown and installed in accordance with Watercare Services Ltd Standard Details. Single riser up to 2.4m shall be used.
10. Drops through manholes as per Watercare Services Ltd Standard Details.
11. Drainage Trenches to be backfilled with compacted clay or hardfill as directed to Engineers requirements.

PWC WASTEWATER RETICULATION

1. All PWC mains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for PWC reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All pipes and fittings shall be to a minimum specification of PE100 PN16 in relation to the pipe grading, with electro-fusion jointing.
4. Construction with Polyethylene pipelines shall be carried out in accordance with AS 2033 and AS/NZS2566.
5. All fittings shall be in accordance with AS/NZS 4129 (Int) Fittings for Polyethylene Pipes for pressure applications.
   - The Contractor must liaise with Council's supervisors regarding inspection of flanged joints.
6. Marker tape with the words "PWC pipe" shall be provided 300mm above all wastewater pressure pipe.
7. A tracer wire that is capable of being energised is to be laid with the pipeline trench at a similar level to the pipe.

Diagram A

Sacle 1:250

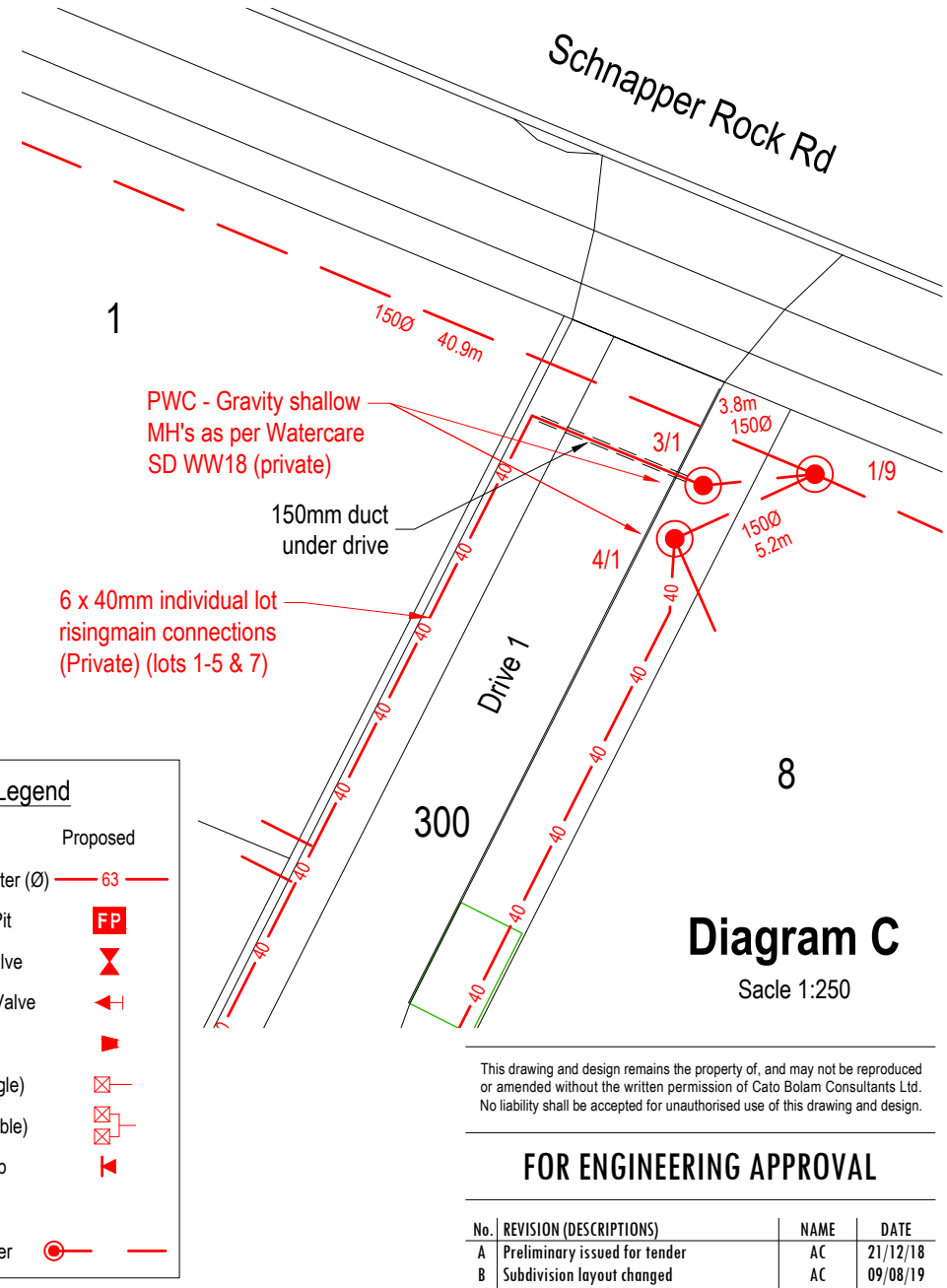


Diagram C

Sacle 1:250

Wastewater Legend

Existing	PWC	Proposed
WW	PWC Wastewater (Ø)	63
FP	Flushing Pit	FP
	Isolation Valve	
	Air Release Valve	
	Reducer	
	Bdy Kit (single)	
	Bdy Kit (double)	
	Blank Cap	
	Gravity	
WW	Wastewater	

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Preliminary issued for tender	AC	21/12/18
B	Subdivision layout changed	AC	09/08/19
C	Wastewater Layout Change	HT	21/10/19
D	Gravity align & Drive 1 & 5 PWC edits	AC	06/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

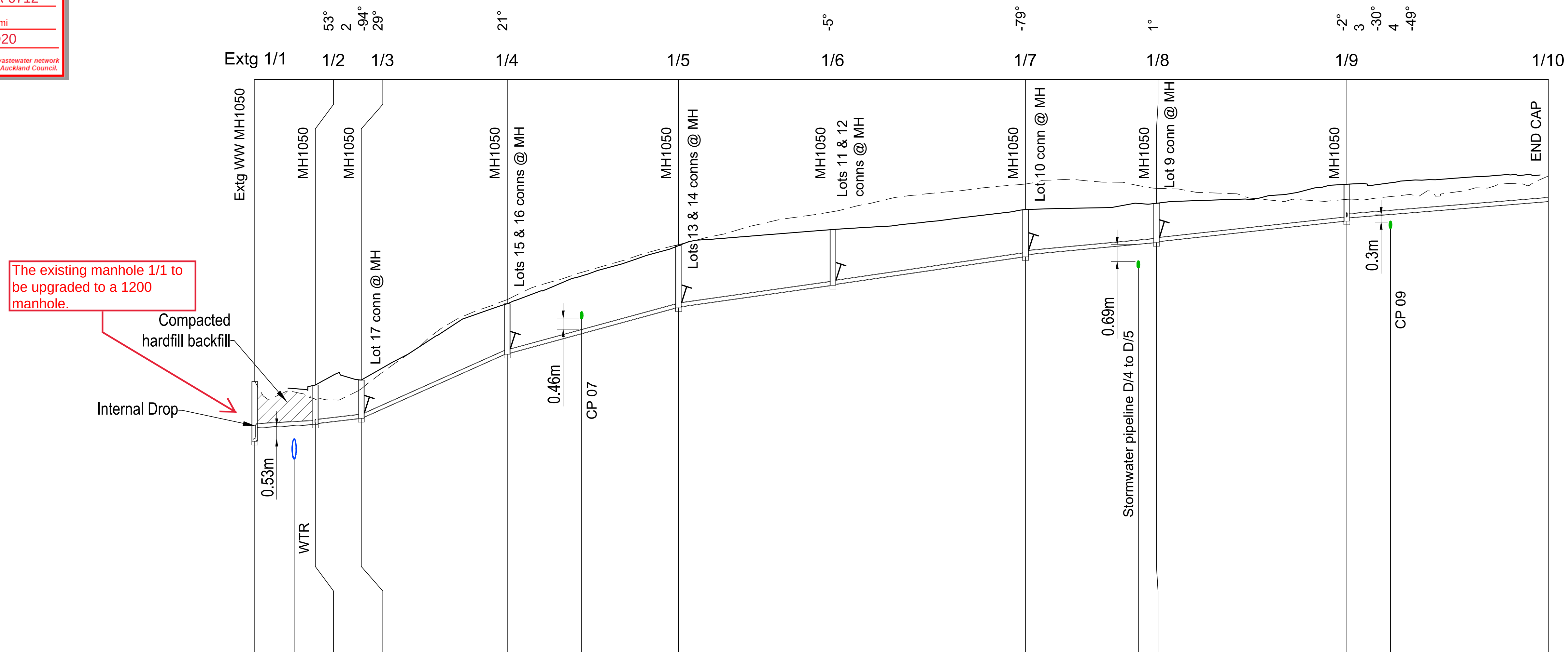
DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	As shown	A3

DRAWING NO.	REVISION
41351-DR-C-4004	D

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Reticulation
Sheet 3



	Extg 1/1 – 1/2	1/2 – 1/3	1/3 – 1/4	1/4 – 1/5	1/5 – 1/6	1/6 – 1/7	1/7 – 1/8	1/8 – 1/9	1/9 – 1/10
GRADE %	1.00%	2.09%	8.64%	5.29%	2.75%	2.85%	1.80%	2.14%	1.61%
PIPE SIZE (mm)	150	150	150	150	150	150	150	150	150
PIPE TYPE	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U	SN16 PVC-U
BEDDING						SAP 7 (As per WW7)			
DATUM	51.000								
DEPTH TO INVERT	2.43 / 1.87 / 1.60	1.55 / 1.56	1.51 / 2.05	2.00 / 2.53	2.48 / 2.27	2.22 / 1.92	1.82 / 1.60	1.55 / 1.50	1.36 / 1.05
INVERT LEVEL	66.09 / 66.65 / 66.77	66.83 / 67.02	67.07 / 69.63	69.68 / 70.48 / 71.52	71.57 / 72.43	72.48 / 73.60	73.70 / 74.12	74.22 / 75.05	75.19 / 75.33 / 75.85
DESIGN SURFACE LEVEL	68.52	68.38	68.58	71.69	74.05	74.7	75.52	75.77	76.55 / 76.9
DISTANCE	0 / 12.3 / 11.2	12.3 / 9.34	21.64 / 29.63	51.27 / 15.1 / 34.81	86.08 / 31.36	117.44 / 39.11	156.55 / 26.59 / 22.9	183.15 / 38.66	221.81 / 8.9 / 40.92 / 262.73

WASTE WATER LINE 1

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Longsections
Sheet 1 of 2

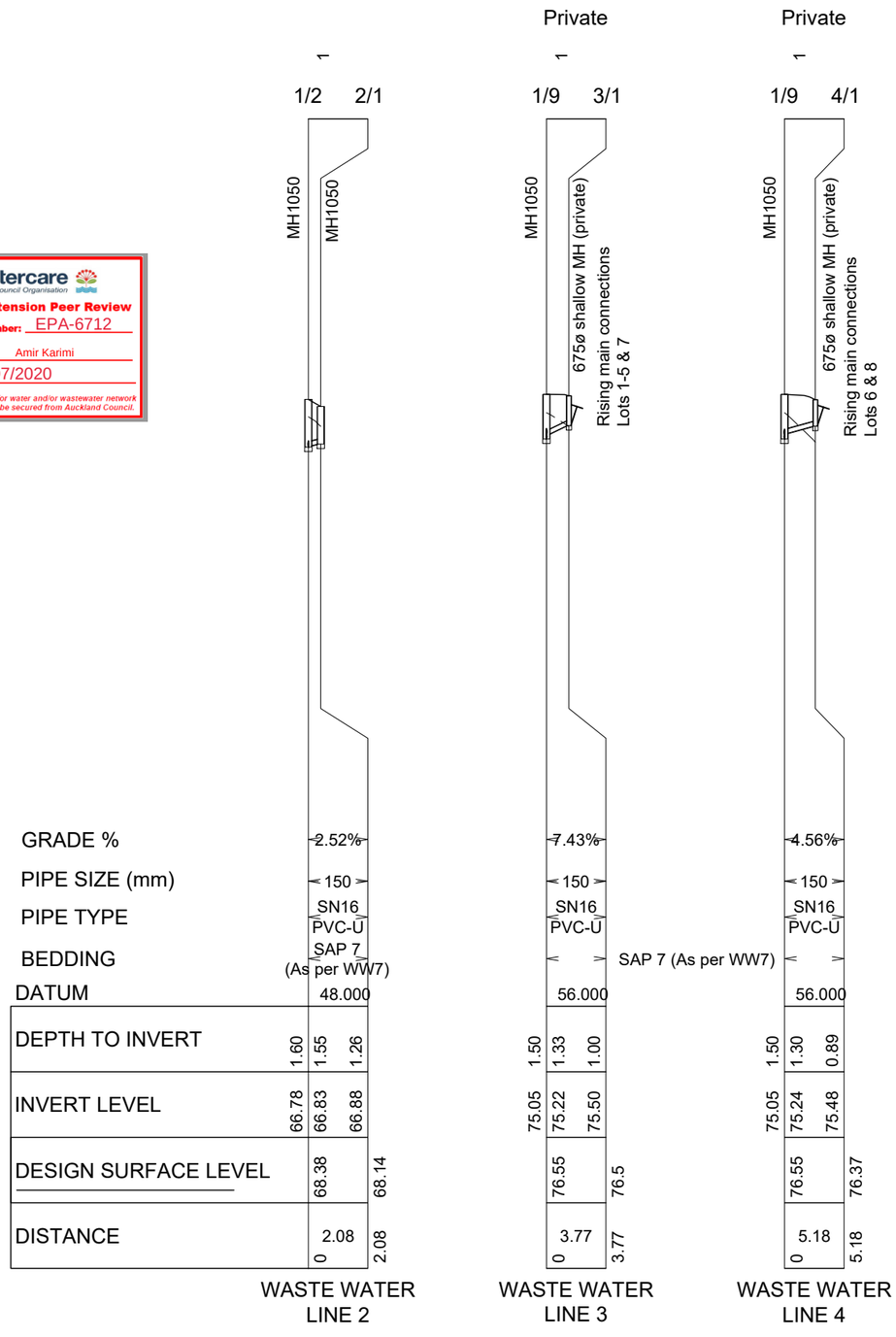
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	06/11/19
B	MH 1/7 moved	AC	27/04/2020
C	Gravity align edits	AC	06/07/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	HT	15/10/19
DRAWN	HT	15/10/19

DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	H 1:1000 V 1:200	A3

DRAWING NO.	REVISION
41351-DR-C-4100	C



Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Wastewater Longsections
Sheet 2 of 2

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	06/11/19
B	line 5 added conn to bdy, MH 1/7 moved	AC	27/04/2020
C	Gravity align edits	AC	06/07/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	HT	15/10/19
DRAWN	HT	15/10/19

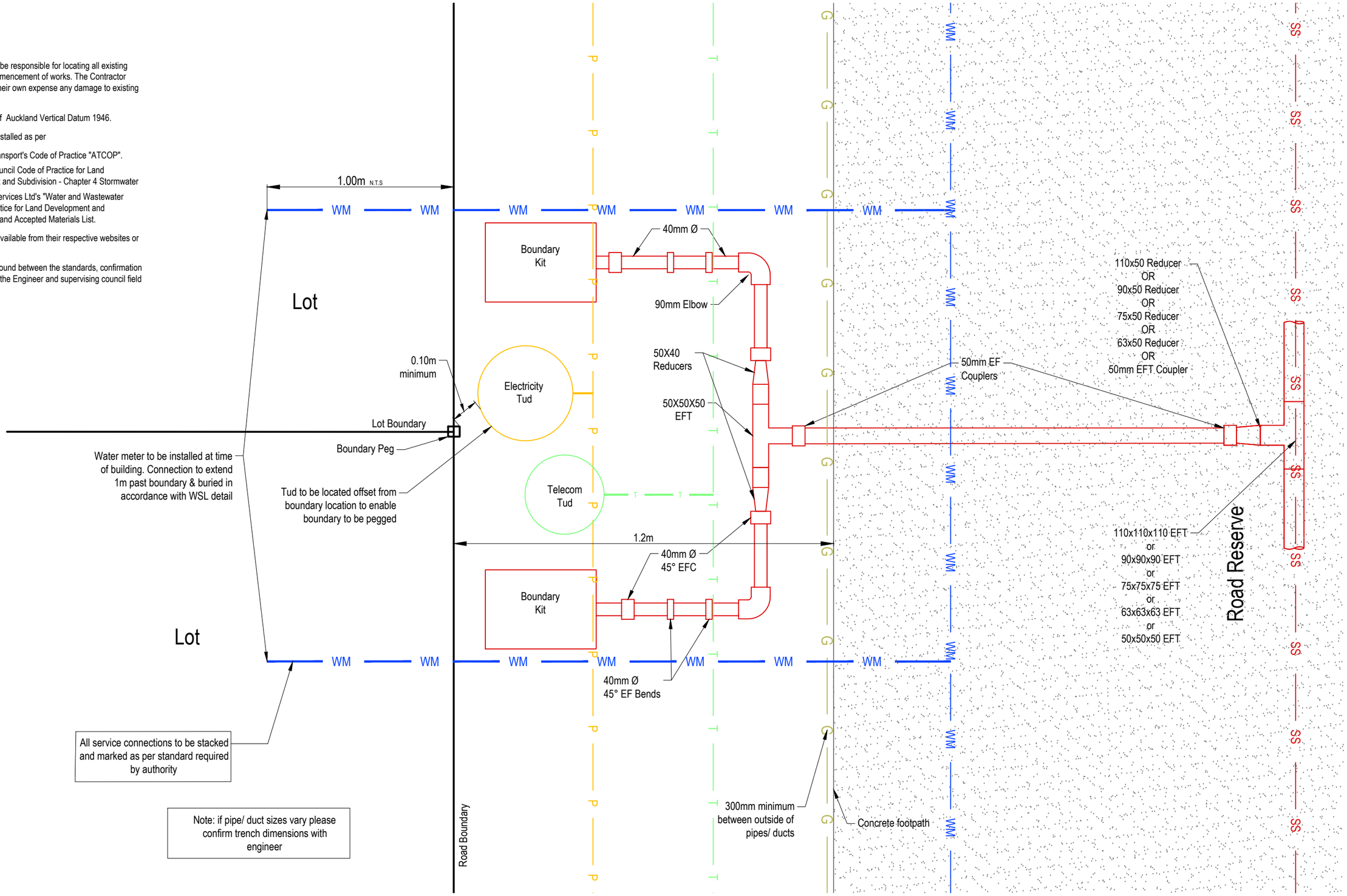
DATE	ORIGINAL SCALE	ORIGINAL SIZE
06/07/2020	H 1:1000 V 1:200	A3

DRAWING NO. 41351-DR-C-4101
REVISION C

NOTES

GENERAL

1. The Contractor shall be responsible for locating all existing services prior to commencement of works. The Contractor shall make good at their own expense any damage to existing services.
2. Levels are in terms of Auckland Vertical Datum 1946.
3. All works are to be installed as per
   - Auckland Transport's Code of Practice "ATCOP".
   - Auckland Council Code of Practice for Land Development and Subdivision - Chapter 4 Stormwater
   - Watercare Services Ltd's "Water and Wastewater Code of Practice for Land Development and Subdivision" and Accepted Materials List.
4. Standard Drawings available from their respective websites or the Engineer.
5. If discrepancies are found between the standards, confirmation shall be sought from the Engineer and supervising council field officer.



Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

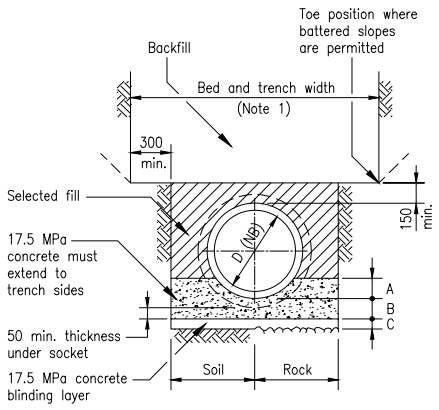
HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

PWC Wastewater Bundary Kit & Service Connection Detail

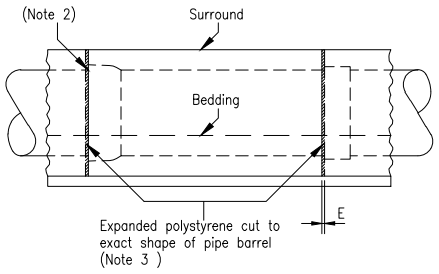
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Tender	AC	21/12/18
B	Subdivision layout changed	MF	09/07/19

FOR ENGINEERING APPROVAL

		NAME	DATE
SURVEYED			
DESIGNED		AC	06/11/18
DRAWN		HT	06/11/18
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
06/11/18	N.T.S	A3	
DRAWING NO.		REVISION	
41351-DR-C-4400		B	



CONCRETE BEDDING



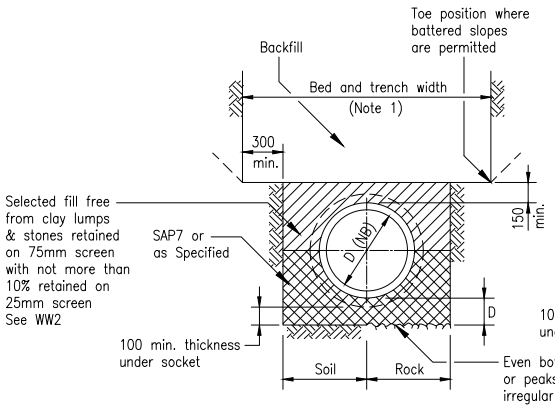
CONCRETE BEDDING AND SURROUND

NOTES :

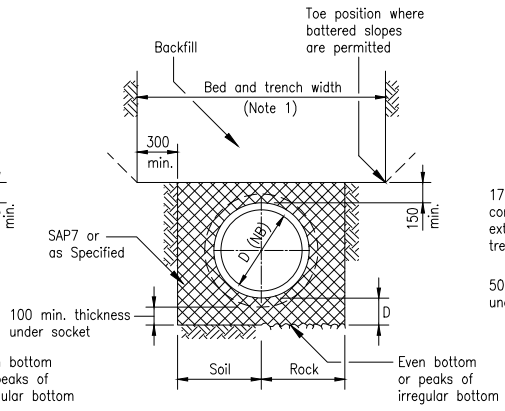
1. Concrete bedding O.A. Width = D+200mm
   Concrete Surround O.A. Width = D+D/2 with Min 50mm concrete either side.
   Granular bedding Min. 300mm either side of the pipe.
2. Wrap joint gap outside the rubber ring with an acceptable system.
3. Expanded polystyrene shall extend the full cross-section of concrete.
4. Bedding and backfill shall be well compacted in layers not exceeding 200mm depth to AS/NZS 2566.2

DIMENSION TABLE		
	D≤250	D=300
A	0.5D	150
B	100	150
C	50	50
D	150	150
E*	25	25
E**	25	25

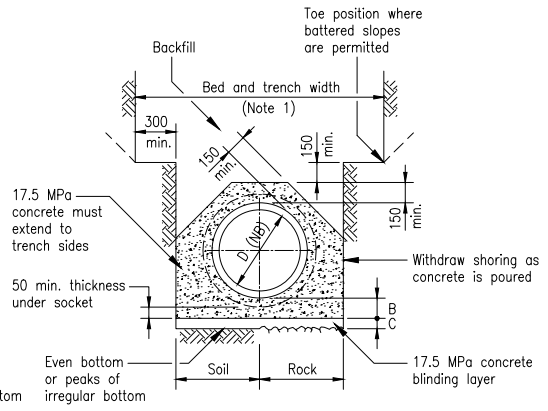
E*=E for concrete surround
E**=E for concrete bedding



GRANULAR BEDDING



GRANULAR SURROUND

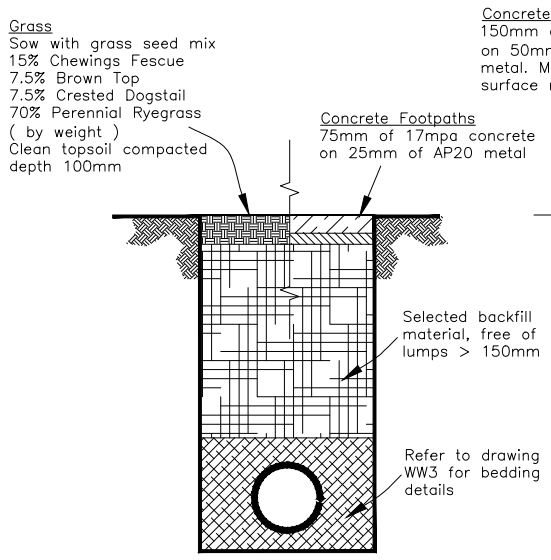


CONCRETE SURROUND

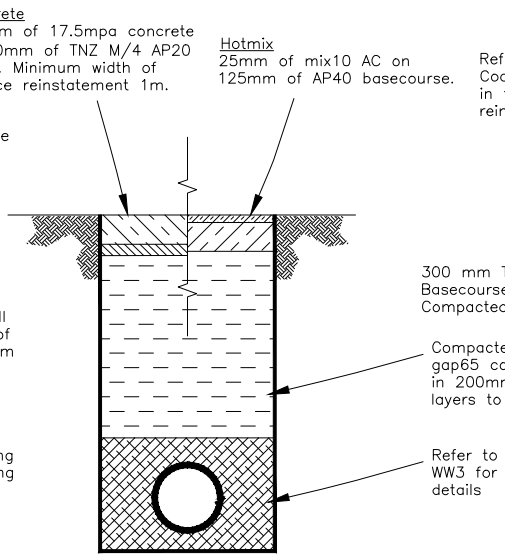
Watercare

BEDDING DETAILS

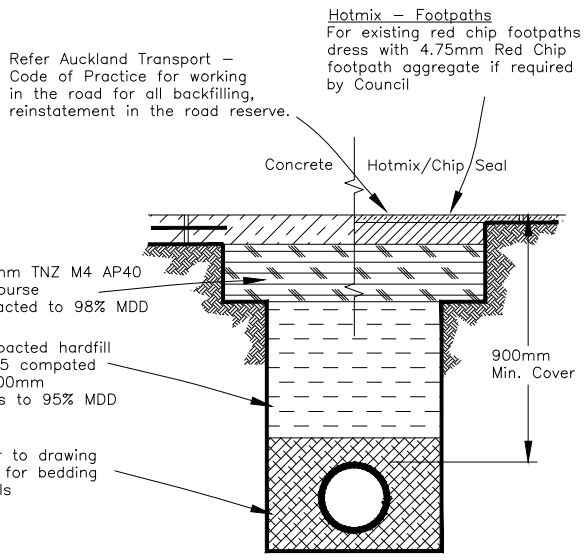
SCALE:	N.T.S.
ISSUE DATE:	23–01–2017
DWG No.	2010070.005C
REFERENCE No.	WW 3



GRASS AREA & FOOTPATH
(Not in Road reserve)
REINSTATEMENT



DRIVEWAY REINSTATEMENT
(Not in Road Reserve)



FOOTPATH/VEHICLE CROSSING,
CARRIAGEWAY REINSTATEMENT

NOTES

1. All trench surface reinstatement within the road reserve shall comply with Auckland Transport requirements.
   The details shown are typical expectations for reinstatements.
2. Backfill shall be compacted in 200mm layers to obtain maximum density as described in Watercare's Construction Standards.
3. Where concrete or other stabilized layers exist in the roadway, the trench shall be reinstated with similar material or as directed by the roading engineer.

Watercare

TYPICAL TRENCH REINSTATEMENT DETAILS FOR WASTEWATER

SCALE:	N.T.S.
ISSUE DATE:	06–03–2017
DWG No.	2010070.001C
REFERENCE No.	WW 2

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Tender	AC	21/12/18
B	Subdivision layout changed	AC	04/11/19
	SURVEYED		
	DESIGNED	AC	04/11/19
	DRAWN	AC	04/11/19

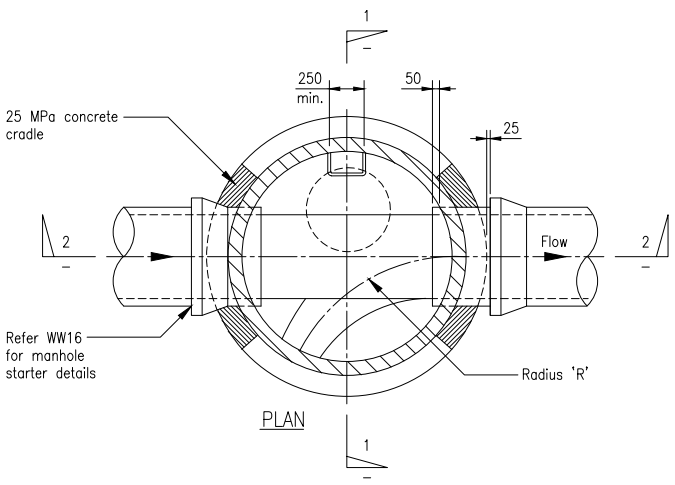
DATE	ORIGINAL SCALE	ORIGINAL SIZE
04/11/19	Not to scale	A3

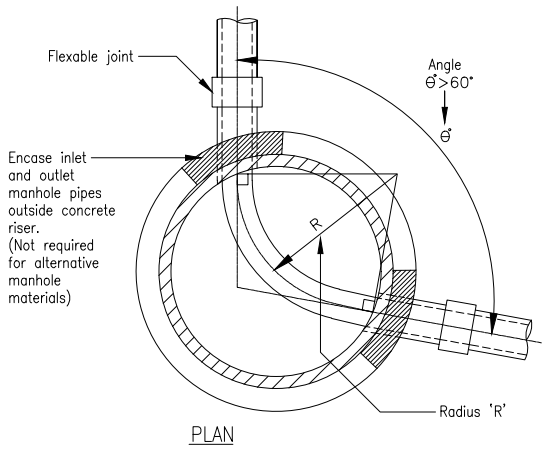
DRAWING NO.	REVISION
41351-DR-C-4500	B

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 1 of 6





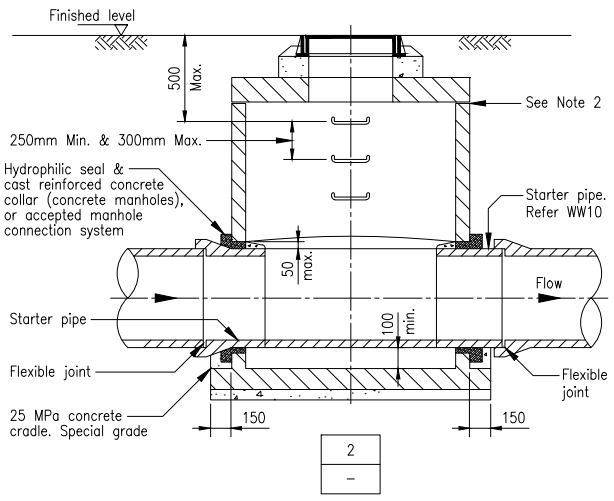
MANHOLE RISER DIAMETERS			
MAX. PIPE DIA.	NO. OF INCOMING PIPES **		
	1	2*	3***
⩽250	1050	1050	1050
300	1500	1500	1500
>300	Refer to transmission dwgs.		

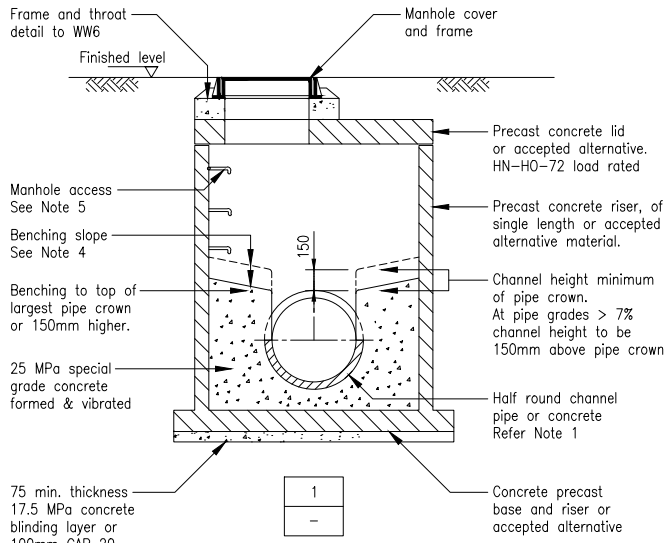
* Based on Max. 120 Deg deflection through manhole.

** To be determined with due regard for future potential connections.

*** Based on Min. 60 Deg between pipes & ⩽ 180 Deg between pipe 1 & pipe 3

[Outside these criteria requires specific design]





NOTES:

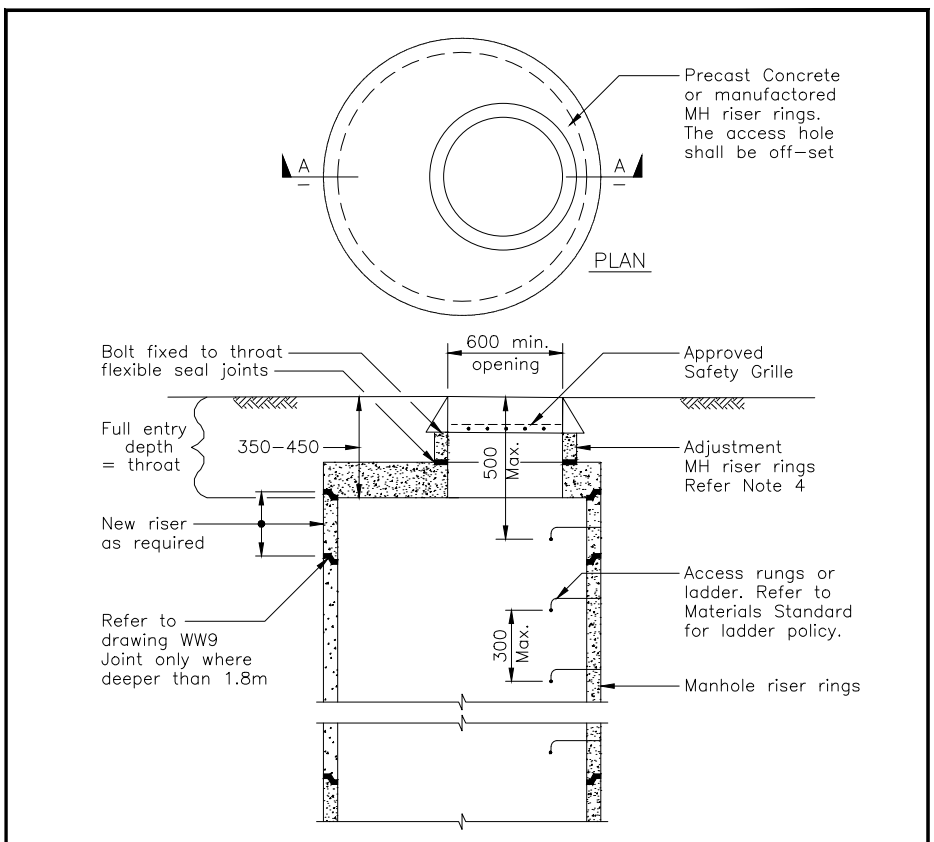
1. Half round channels shall be pre-formed from a corrosion, prehibitive material.
2. Joint seals shall be an acceptable flexible seal. The joint shall be closed with an epoxy mortar (if concrete) & externally wrapped with an acceptable wrapping system.
3. Refer WW6 for manhole throat and cover details.
4. Concrete benching shall have a minimum slope of 1 in 12, proprietary benching products with a smooth surface (such as Polyethylene) shall not be less than 1 in 20. Refer to Watercare material supply standard.
5. Refer to the material supply standard for step-rung and ladder policy.
6. For manholes deeper than 1.8m Refer to WW9
6. Abbreviations :
   Min. = Minimum
   I.D. = Internal diameter
   'R' = Min. Radius (3 x I.D.).

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.010D .DWG

Watercare

MANHOLE GENERAL DETAILS AND LAYOUT FOR MANHOLES UP TO 1.8m DEEP

SCALE:	N.T.S.
ISSUE DATE:	13-07-2018
DWG No.	2010070.010D
REFERENCE No.	WW 5



TYPICAL SECTION A-A THROUGH MANHOLE

NOTES:

1. Lid supplied to HN-HO-72 loading and compliance certified.
2. When the throat depth is greater than 450mm, a new manhole riser is required with a new adjustment ring.
3. Refer drawing WW9 for manholes deeper than 1.8m
4. Refer drawing WW7 for sloping ground.
5. Refer drawing WW5 for manhole details.
6. Approved Safety Grille below access manhole cover.
7. Manhole covers in the road shall be constructed so that the cover hinge is facing the oncoming traffic. (Refer Fig 1)
8. For all other covers the orientation should be so that the cover hinge is at 90 degrees from the ladder, Either side. (Refer Fig 2)

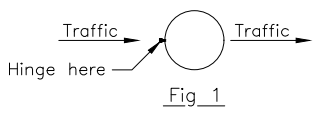


Fig 1

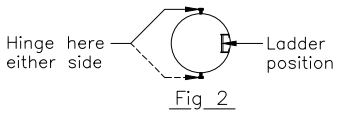


Fig 2

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.029C .DWG

Watercare

TYPICAL MANHOLE THROAT AND COVER DETAILS

SCALE:	N.T.S.
ISSUE DATE:	13-07-2018
DWG No.	2010070.029C
REFERENCE No.	WW 6

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Tender	AC	21/12/18
B	Subdivision layout changed	AC	04/11/19
SURVEYED			
DESIGNED		AC	04/11/19
DRAWN		AC	04/11/19

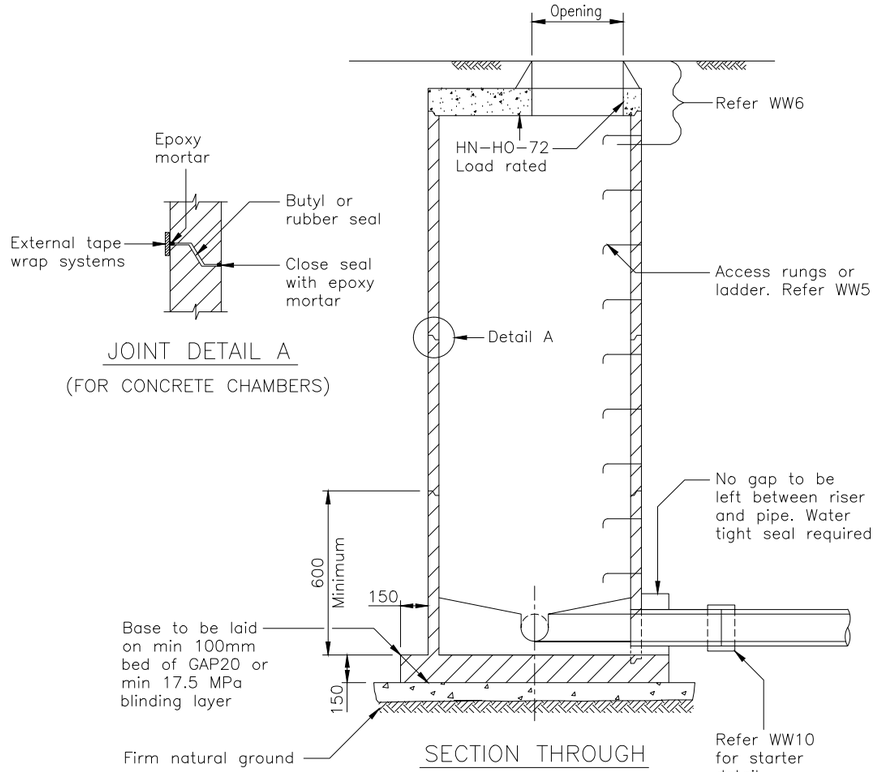
DATE	ORIGINAL SCALE	ORIGINAL SIZE
04/11/19	Not to scale	A3

DRAWING NO.	REVISION
41351-DR-C-4501	B

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 2 of 6



JOINT DETAIL A

(FOR CONCRETE CHAMBERS)

SECTION THROUGH MANHOLE

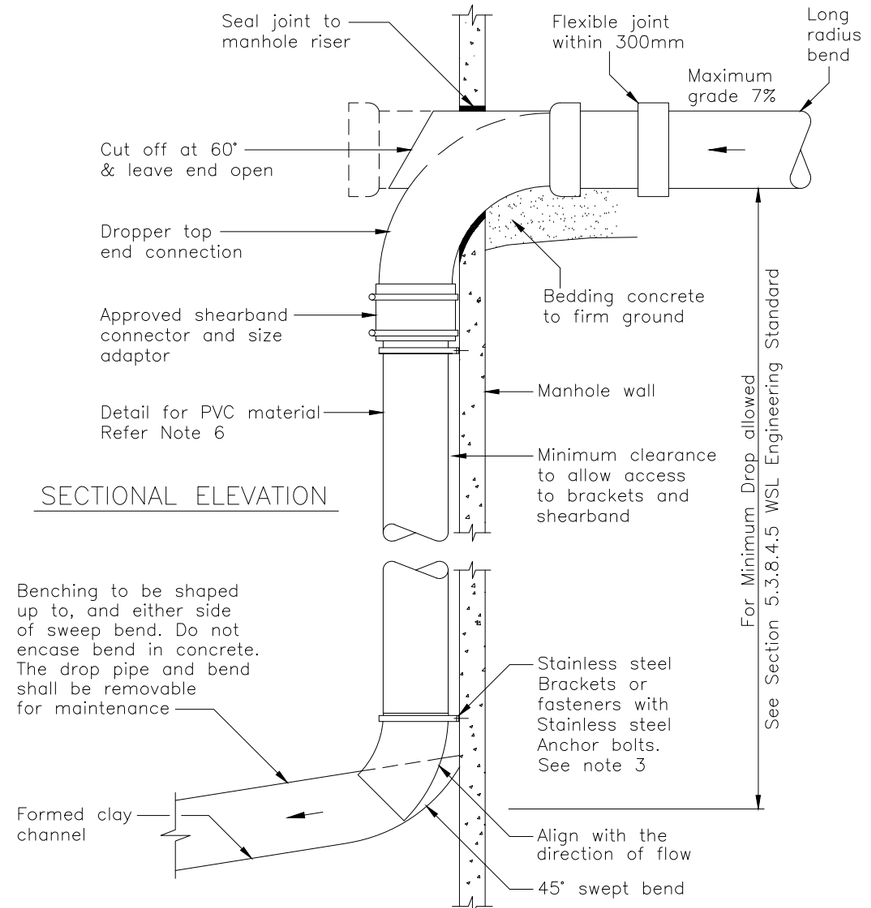
Notes:

1. Refer to WW5 for general details.
2. Channel through manhole to be lined.
3. All manhole openings must be cut.
4. For droppers refer to WW13
5. The manhole diameter shall be increased to minimum internal 1200mm for all manholes greater than 3.0 metres deep.
6. For manholes > 6.0 meters deep the minimum internal diameter shall be 1500mm.
7. Refer WW6 for manhole throat and cover details.
8. Manholes greater than 6m deep must be installed with landing platforms. Refer drawing in (Transmission drawing set)

Watercare

MANHOLES > 1.8m DEEP

SCALE:	N.T.S.
ISSUE DATE:	13–03–2017
DWG No.	2010070.012D
REFERENCE No.	WW 9



SECTIONAL ELEVATION

NOTES:

1. Specific approval is required from Watercare for all internal drop connections to existing manholes. Considerations include space available in the existing manhole and number of existing internal drop connections.
2. Internal drop shall be clear of Manhole rungs/ladders.
3. 100ø to 300ø PVC drop pipe held in place by Stainless steel brackets or fasteners with M10 Stainless steel anchor bolts every 600 mm.
4. Specific design is required where the incoming grade exceeds 7%, high velocity or where deep manholes make plunge–droppers unsuitable.
5. The minium clear diameter in the manhole shall be 1m. Vertical droppers are not allowed in manholes under 1200mm diameter.
6. This detail is suitable for GRP. For PE, joints shall be butt–welded. The PE top end connections shall be fabricated to fit over the incoming pipe with an O–ring seal.

Watercare

INTERNAL MANHOLE
PLUNGE–DROP PIPE

SCALE:	N.T.S.
ISSUE DATE:	06–03–2017
DWG No.	2010070.018C
REFERENCE No.	WW 13

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 3 of 6

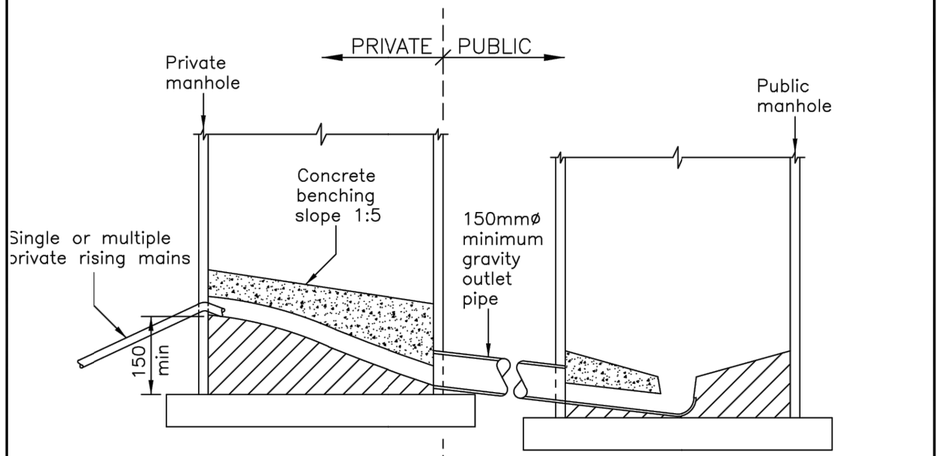
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Engineering Tender	AC	21/112/18
B	Subdivision layout changed	AC	04/11/19

FOR ENGINEERING APPROVAL

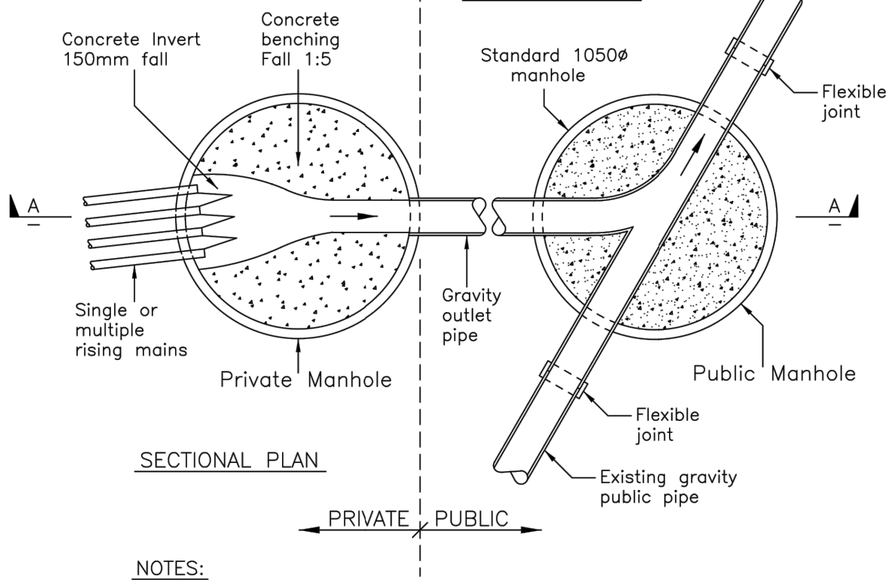
	NAME	DATE
SURVEYED		
DESIGNED	AC	04/11/19
DRAWN	PJT	05/11/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
21/10/2019	Not to scale	A3

DRAWING NO.	REVISION
41351-DR-C-4502	B



SECTIONAL A–A



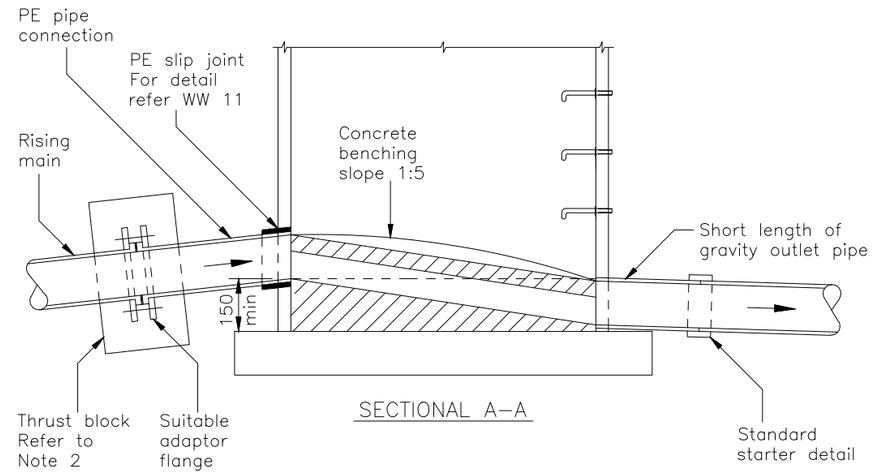
SECTIONAL PLAN

NOTES:

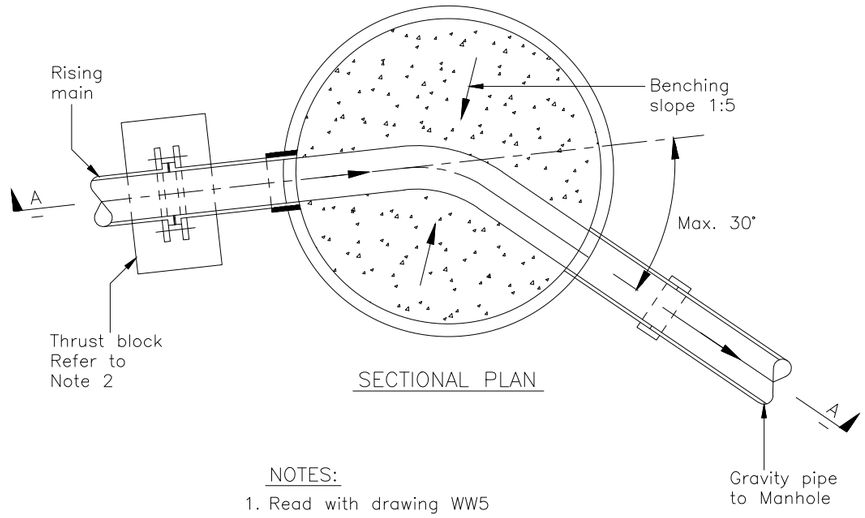
1. Read with WW5 and WW7
2. For pressure main outlet detail refer to drawing WW19
3. Private main connection to the public wastewater shall be made via a private shallow manhole with a public 150mm min. gravity pipe feed to public wastewater or manhole.

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.043A .DWG

PRIVATE RISING MAIN CONNECTION	
SCALE:	N.T.S.
ISSUE DATE:	06–03–2017
DWG No.	2010070.043A
REFERENCE No.	WW 18



SECTIONAL A–A



SECTIONAL PLAN

NOTES:

1. Read with drawing WW5
2. Thrust blocks to be constructed on rising main inlet and will be cast against firm ground. For thrust block details refer to drawing WW24
3. For private rising main connections refer to drawing WW18

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.041A .DWG

PRESSURE SEWER OUTLET TO GRAVITY PUBLIC	
SCALE:	N.T.S.
ISSUE DATE:	06–03–2017
DWG No.	2010070.041A
REFERENCE No.	WW 19

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 4 of 6

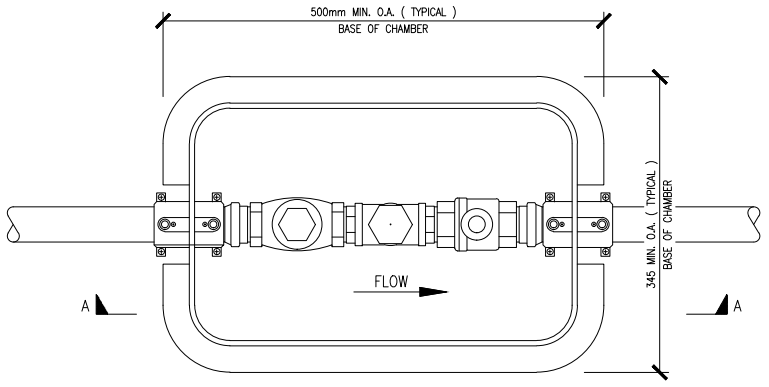
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Engineering Tender	AC	21/112/18
B	Subdivision layout changed	AC	04/11/19

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	AC	04/11/19
DRAWN	PJT	05/11/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
04/11/19	Not to scale	A3

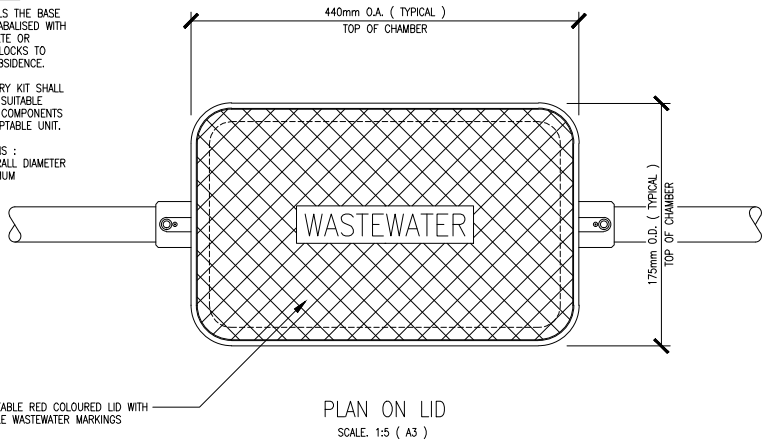
DRAWING NO. 41351-DR-C-4503
REVISION B



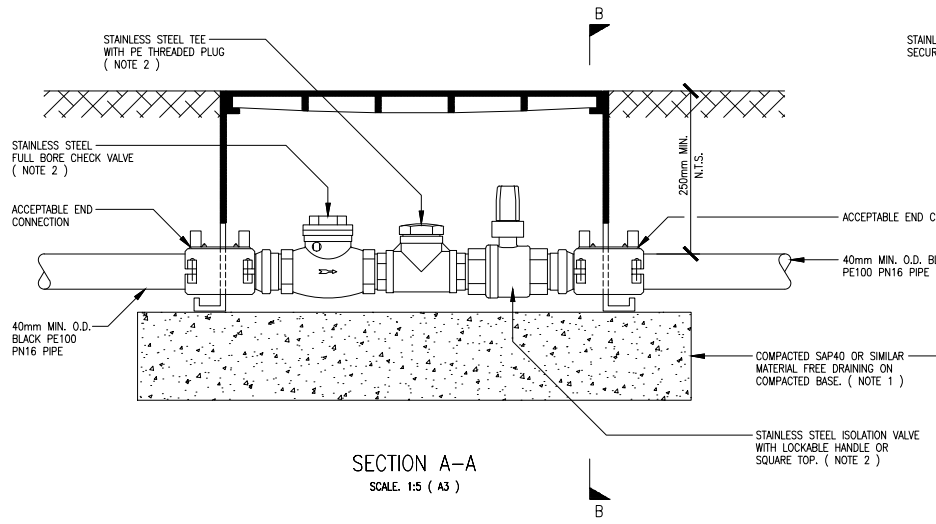
SECTIONAL PLAN
SCALE. 1:5 (A3)

NOTES

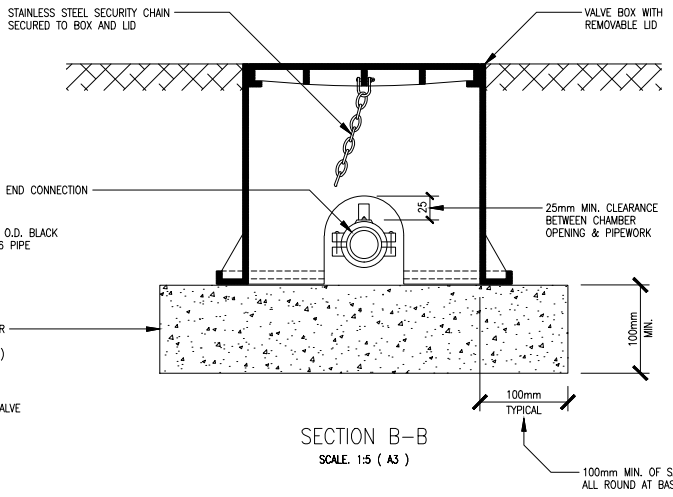
1. IN SOFT SOILS THE BASE MUST BE STABALISED WITH SITE CONCRETE OR CONCRETE BLOCKS TO PREVENT SUBSIDENCE.
2. THE BOUNDARY KIT SHALL CONSIST OF SUITABLE ACCEPTABLE COMPONENTS OR AN ACCEPTABLE UNIT.
3. ABBREVIATIONS :
   O.D. = OVERALL DIAMETER
   MIN. = MINIMUM



PLAN ON LID
SCALE. 1:5 (A3)



SECTION A–A
SCALE. 1:5 (A3)



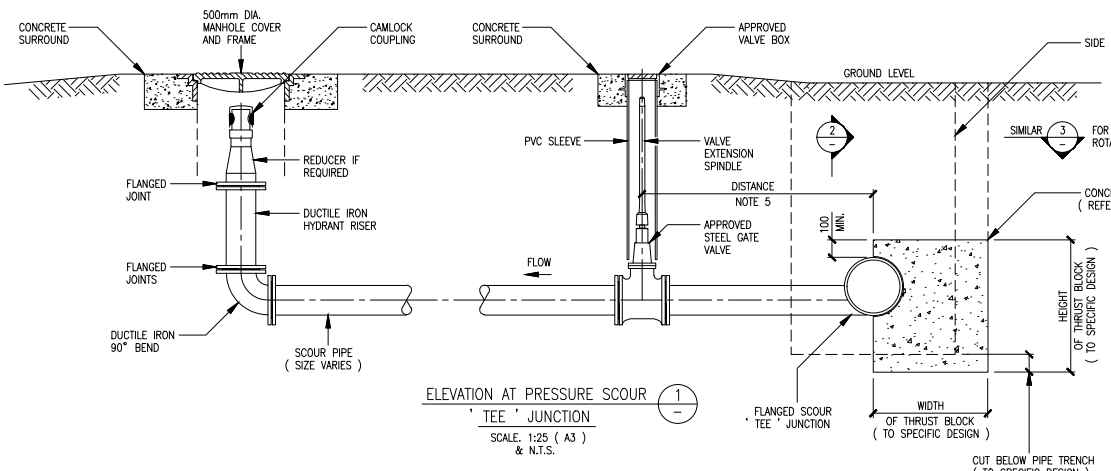
SECTION B–B
SCALE. 1:5 (A3)

O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.056 .DWG

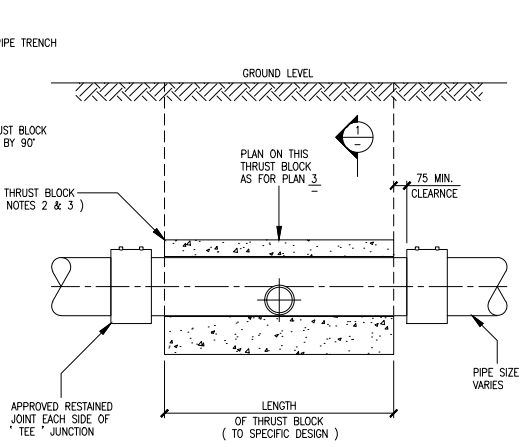
Watercare

BOUNDARY PRESSURE WASTEWATER CONNECTION

SCALE:	1:5 (A3)
ISSUE DATE:	23–01–2017
DWG No.	2010070.056
REFERENCE No.	WW 21

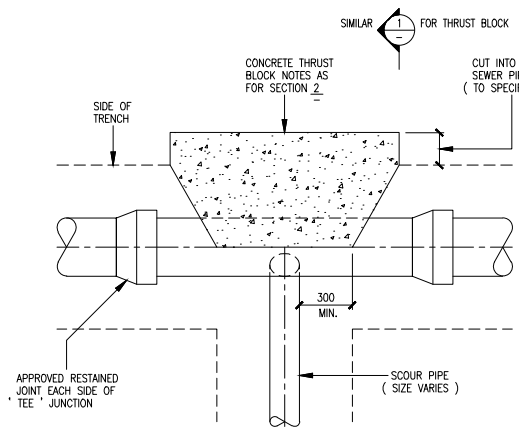


ELEVATION AT PRESSURE SCOUR ' TEE ' JUNCTION 1
SCALE. 1:25 (A3) & N.T.S.



SECTION AT PRESSURE SCOUR ' TEE ' JUNCTION 2
SCALE. 1:25 (A3) & N.T.S.

Anchor block size based on 100KPa. soil bearing stress			
PIPE DIA.	LENGTH	DEPTH	WIDTH
100mm	500	250	250
150mm	900	300	450
200mm	1100	450	550



PLAN AT GRAVITY SCOUR ' TEE ' JUNCTION 3
SCALE. 1:25 (A3) & N.T.S.

NOTES

1. DETAILS ON THIS DRAWING ARE DIAGRAMMATIC. PIPE SIZES AND PIPE DEPTHS VARY.
2. THRUST BLOCKS SHALL BE SIZED FOR THE SPECIFIC SOIL BEARING CAPACITY TAKING INTO ACCOUNT THE MAXIMUM PUMPING PRESSURE AND FLOW VELOCITY.
3. THRUST BLOCKS SHALL BE CAST AGAINST THE UNDISTURBED CUT FACE OF THE EXCAVATION.
4. WHERE THE PIPE COMES IN CONTACT WITH THE THRUST BLOCK THE PIPE SHALL BE WRAPPED IN A PROTECTIVE MEMBRANE TO PREVENT ABRASION BETWEEN THE CONCRETE AND THE PIPE.
5. DISTANCE TO ISOLATION VALVE TO BE AS SHORT AS POSSIBLE TO PREVENT SEPTICITY.

KEY

N.T.S. = NOT TO SCALE
MIN. = MINIMUM

O:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010070.055 .DWG

Watercare

PRESSURE WASTEWATER FLUSH–OUT / SCOUR

SCALE:	AS SHOWN
ISSUE DATE:	21–03–2017
DWG No.	2010070.055
REFERENCE No.	WW 20

FOR ENGINEERING APPROVAL

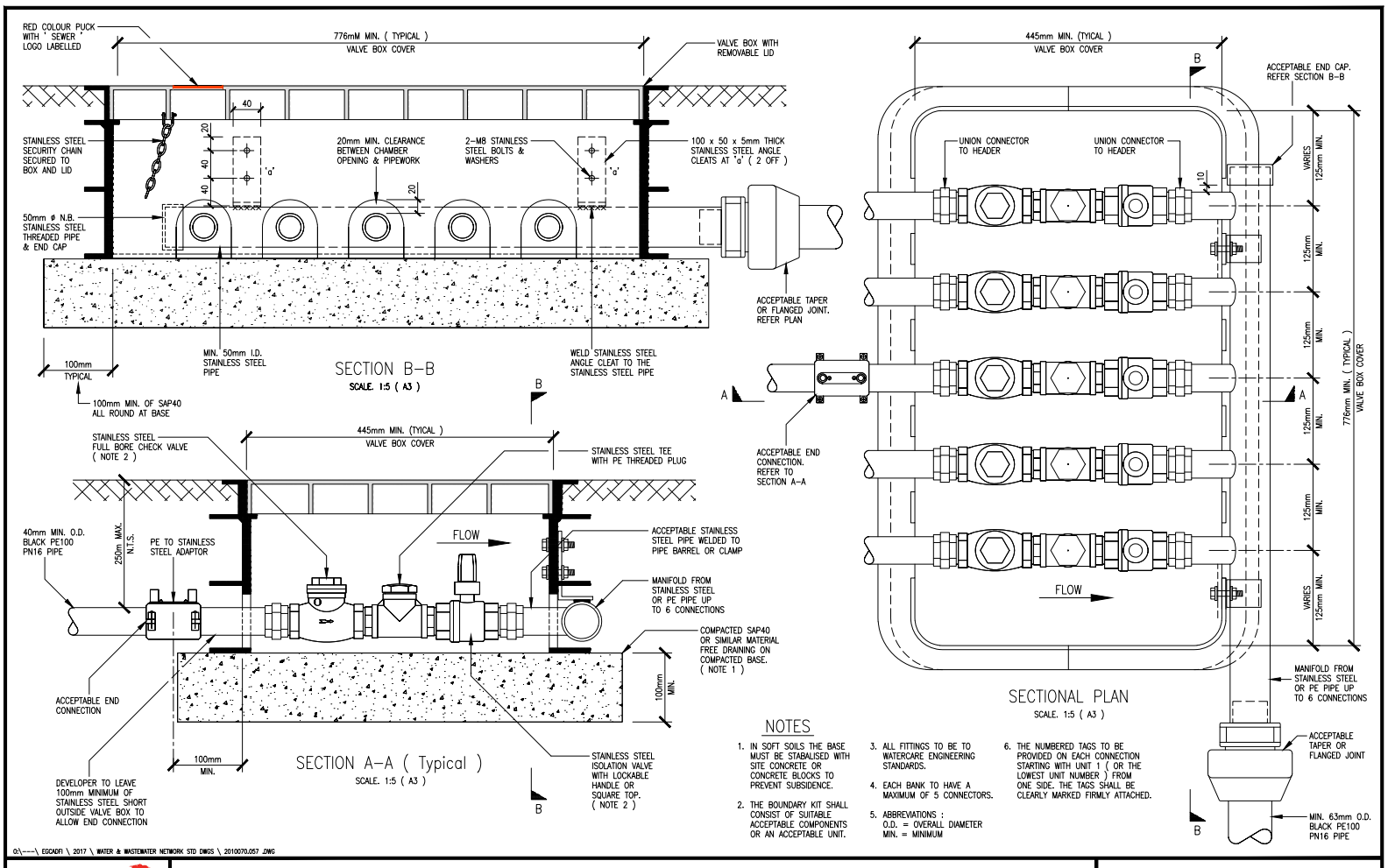
No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision layout changed - new sheet	AC	04/11/19

SURVEYED			
DESIGNED		AC	04/11/19
DRAWN		AC	04/11/19
DATE 04/11/19	ORIGINAL SCALE Not to scale	ORIGINAL SIZE A3	
DRAWING NO. 41351-DR-C-4504		REVISION B	

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 5 of 6



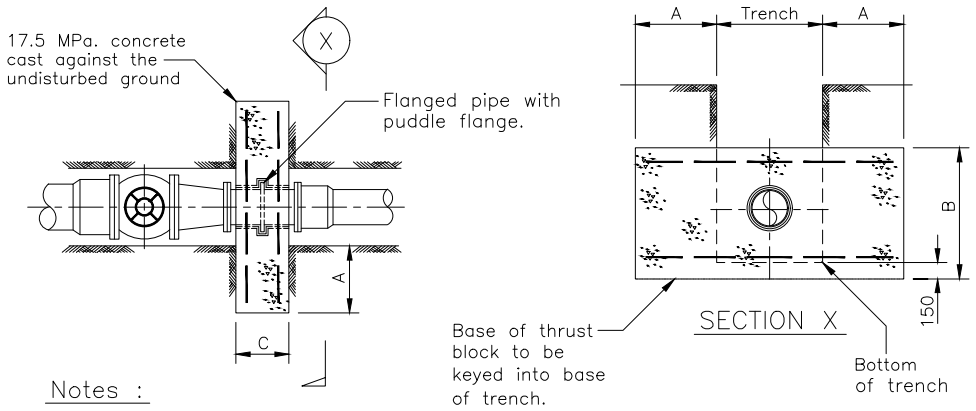
NOTES

1. IN SOFT SOILS THE BASE MUST BE STABALISED WITH SITE CONCRETE OR CONCRETE BLOCKS TO PREVENT SUBSIDENCE.
2. THE BOUNDARY KIT SHALL CONSIST OF SUITABLE ACCEPTABLE COMPONENTS OR AN ACCEPTABLE UNIT.
3. ALL FITTINGS TO BE TO WATERCARE ENGINEERING STANDARDS.
4. EACH BANK TO HAVE A MAXIMUM OF 5 CONNECTORS.
5. ABBREVIATIONS : O.D. = OVERALL DIAMETER MIN. = MINIMUM
6. THE NUMBERED TAGS TO BE PROVIDED ON EACH CONNECTION STARTING WITH UNIT 1 (OR THE LOWEST UNIT NUMBER) FROM ONE SIDE. THE TAGS SHALL BE CLEARLY MARKED FIRMLY ATTACHED.

Watercare

BOUNDARY MULTI-CONNECTION FOR PRESSURE WASTEWATER

SCALE:	1:5 & N.T.S. (A3)
ISSUE DATE:	13-07-2018
DWG No.	2010070.057A
REFERENCE No.	WW 22



Notes :

1. Concrete thrust block dimensions for firm soil conditions.
2. The dimensions to be increased or decreased for variation in soil conditions.
3. Allowable bearing stress used - 100kPa.
4. Internal pipe test pressure up to 1400kPa.
5. As built locations to be obtained prior to backfill.
6. Protective membrane (Polythene) between concrete and pipe.
7. 75mm clearance between fittings/flanges and concrete casting.
8. All fittings to be wrapped with a suitable wrapping system.

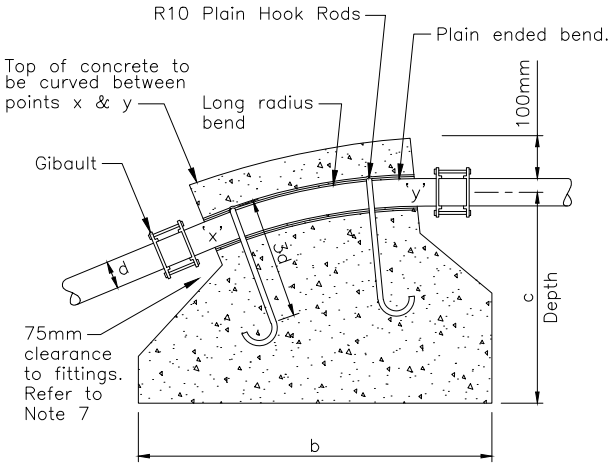
Reducer mm	Reducers		
	A	B	C
100-150	250	350	300
100-200	500	350	300
150-200	250	500	300
150-250	500	500	300
200-250	250	600	300
200-300	400	700	300
250-300	300	800	300

ANCHOR BLOCKS AT REDUCERS

Pipe Dia	Vertical Bends-45° a	b	c
100mm	600	800	700
150mm	800	1000	800
200mm	1000	1200	800
250mm	1000	1600	1000
300mm	1000	2000	1200

Pipe Dia	Vertical Bends-22.5° a	b	c
100mm	500	500	500
150mm	500	800	800
200mm	700	1000	800
250mm	800	1200	900
300mm	900	1500	1000

Pipe Dia	Vertical Bends-11.25° a	b	c
100mm	400	500	500
150mm	500	600	600
200mm	500	800	800
250mm	700	1000	800
300mm	800	1200	900



VERTICAL SECTION

ANCHOR BLOCKS AT BENDS IN VERTICAL PLANE

Watercare

ANCHOR BLOCK DETAILS REDUCERS AND VERTICAL BENDS FOR PRESSURE SYSTEMS

SCALE:	N.T.S.
ISSUE DATE:	06-03-2017
DWG No.	2010070.053B
REFERENCE No.	WW 24

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision layout changed - new sheet	AC	04/11/19
SURVEYED			
DESIGNED		AC	04/11/19
DRAWN		AC	04/11/19

DATE	ORIGINAL SCALE	ORIGINAL SIZE
04/11/19	Not to scale	A3

DRAWING NO.	REVISION
41351-DR-C-4505	B

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Wastewater
Standard Details
Sheet 6 of 6

NOTES

GENERAL

1. The Contractor shall be responsible for locating all existing services prior to commencement of works. The Contractor shall make good at their own expense any damage to existing services.
2. Levels are in terms of Auckland Vertical Datum 1946.
3. All works are to be installed as per
   - Auckland Transport's Code of Practice "ATCOP".
   - Auckland Council Code of Practice for Land Development and Subdivision - Chapter 4 Stormwater
   - Watercare Services Ltd's "Water and Wastewater Code of Practice for Land Development and Subdivision" and Accepted Materials List.
4. Standard Drawings available from their respective websites or the Engineer.
5. If discrepancies are found between the standards, confirmation shall be sought from the Engineer and supervising council field officer.

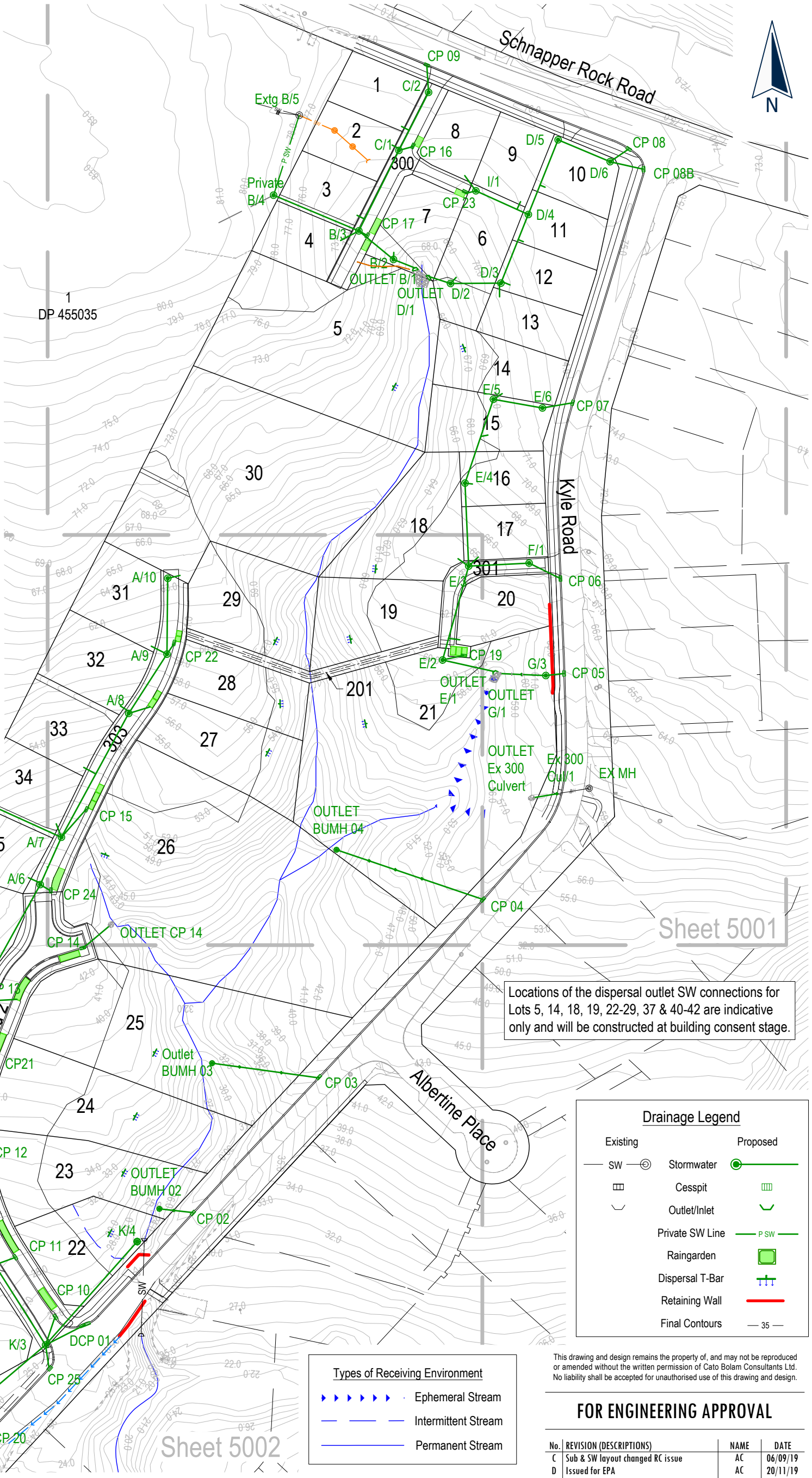
STORMWATER DRAINAGE

1. Pipes -
   - All pipes 200mm diameter or less are to be uPVC AS/NZSS 1260 Solid Wall SN16 otherwise shown.
   - All pipes 225mm diameter or greater are to be reinforced concrete rubber ring joint to NZS3107 - Depths :

     Class 2 < 2000mm cover,

     Class 3 < 2001mm - 3000mm cover,

     Class 4 > 3000mm cover or trafficable areas, unless otherwise shown.
2. All thrusted pipes are to be PE100 SDR17. All diameters shown are minimum inside diameters.
3. Bedding details as per SWCoP Standard Detail SW01 - SW03
4. Manholes and chambers in traffic areas are to be heavy duty.
5. All manholes up to 2.4m deep shall be constructed of a single riser to finished ground level.
6. Stormwater manhole throats are to be painted blue.
7. All service connections are to be ramped to within 1.2m of finished level. Connections shall terminate with a factory sealed stopper and marked with a 50mm x 50mm H4 Treated Stake painted blue.
8. Hardfill be placed where pipelines cross or where lines cross carriageways or trafficable areas.
9. Pipe Crossings - Hardfill Backfill. If clearance between pipes is less than 150mm, 55mm thick Polystyrene shall be placed against the underside of the pipe. Where clearance is less than 300mm the bell jointed pipes are used, there shall be no joints directly over the wastewater line.
10. All manholes 1050mmØ flanged base concrete riser unless otherwise shown.
11. Drop connections through Stormwater Manholes must not exceed 1m without approval from the Engineer. Benching through drop manholes must be finished with hard 40MPa Concrete.
12. Drainage Trenches to be backfilled with compacted clay or hardfill to Engineers requirements.



Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

Locations of the dispersal outlet SW connections for Lots 5, 14, 18, 19, 22-29, 37 & 40-42 are indicative only and will be constructed at building consent stage.

Drainage Legend

Existing		Proposed
SW	Stormwater	
	Cesspit	
	Outlet/Inlet	
	Private SW Line	P SW
	Raingarden	
	Dispersal T-Bar	
	Retaining Wall	
	Final Contours	35

Types of Receiving Environment

- Ephemeral Stream
- Intermittent Stream
- Permanent Stream

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
C	Sub & SW layout changed RC issue	AC	06/09/19
D	Issued for EPA	AC	20/11/19
E	Swales removed	AC	03/04/2020
F	SW alignment & CP outlet edits	AC	22/06/2020
SURVEYED			
DESIGNED		PJT	25/09/18
DRAWN		PJT	25/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
22/06/2020	1:1500	A3

DRAWING NO. 41351-DR-C-5000

REVISION F

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Layout
Overall Plan

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

N

Schnapper Rock Road

Kyle Road

Existing lines, MHs & outlet to be removed

Existing MH & line from pump station, surveyed location

Private line to be constructed under separate building consent

To be designed & constructed by others

CP 09 225ø 10.0m C/2

225Ø 23.8m

CP 16

C/1

225ø 8.2m CP 08

D/5 225Ø 20.6m D/6 225Ø 12.5m CP 08B

225Ø 29.3m

225ø 5.5m CP 23 3.3m 225Ø 225Ø 21.0m D/4

I/1

225Ø 32.8m

Extg B/5

Extg CP

Private B/4 525Ø 33.7m B/3 CP 17

225Ø 3.6m

525Ø 16.4m 600Ø 8.4m B/2 OUTLET B/1

OUTLET D/1 D/2 225Ø D/3 375Ø 18.4m 8.0m

225Ø 26.9m

Wingwall outlets as per AC SWCop SW19 & rock riprap protection

See Diagram A Sheet 5004

E/5 E/6 225Ø 18.2m 11.2m 225Ø CP 07

225Ø 32.3m

E/4 16

225Ø 30.3m

225Ø 22.1m F/1 225Ø 12.7m CP 06

E/3 301

300Ø 35.6m

CP 19 E/2 225Ø 1.5m 300Ø 19.3m DM G/2 G/3 CP 05

OUTLET E/1 200Ø 7.8m 200Ø 8.8m 225Ø 6.7m

OUTLET G/1

Wingwall outlets as per AC SWCop SW19 & rock riprap protection

See Diagram B Sheet 5004

OUTLET Ex 300 Culvert

Ex 300 Cul/1 EX MH

300Ø 8.4m 300Ø 12.0m

Extend existing line and provide riprap protection at outlet . 100ø rock 200mm deep on geotextile cloth underlay 2.2m long x 1.0m wide

A/10 225Ø 27.7m

A/9 225Ø 25.7m 225Ø 4.9m CP 22

A/8 225Ø 51.4m

Rain gardens (precast boxes)

Rain gardens (precast boxes)

CP 15

Bubble-up MH outlet see detail sheet 5800

OUTLET BUMH 04

DM CP 04/1 DM CP 04/2 DM CP 04/3

200Ø 12.7m 200Ø 10.1m 200Ø 10.3m 200Ø 23.5m

CP 04

Pipe laid overland through protected bush areas see sheet 5800 for detail

Rain garden (battered)

OUTLET CP 14

201 Pedestrian Accessway

Locations of the dispersal outlet SW connections for Lots 5, 14, 18, 19, 22-29, 37 & 40-42 are indicative only and will be constructed at building consent stage.

For standard notes see drawing 41351-DR-C-5000

Drainage Legend

Existing		Proposed
SW	Stormwater	
	Cesspit	
	Outlet/Inlet	
P SW	Private SW Line	
	Raingarden	
	Dispersal T-Bar	
	Retaining Wall	
35	Final Contours	

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision & SW layout changed	AC	20/08/19
C	Swales removed	AC	03/04/2020
D	SW alignment edits	AC	04/06/2020
E	CP & extg 300ø culvert outlet edits	AC	22/06/2020
SURVEYED			
DESIGNED		PJT	25/09/18
DRAWN		PJT	25/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
22/06/2020	1:1000	A3

DRAWING NO.	REVISION
41351-DR-C-5001	E

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Layout
Sheet 1 of 4

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

N

Rain gardens (precast boxes)

Rain gardens (precast boxes)

Rain gardens (battered)

Rain garden (battered)

Rain garden (precast box)

Rain gardens (battered)

Rain gardens (battered)

Rain gardens (battered)

Rain gardens (precast boxes)

Bubble-up MH outlet see detail sheet 5800

Bubble-up MH outlet see detail sheet 5800

Pipe laid overland through protected bush areas see sheet 5800 for detail

201 Pedestrian Accessway

Road 2

Kyle Road

Albertine Place

New table drain merge into existing

Existing culvert

Sheet 5003

Locations of the dispersal outlet SW connections for Lots 5, 14, 18, 19, 22-29, 37 & 40-42 are indicative only and will be constructed at building consent stage.

For standard notes see drawing 41351-DR-C-5000

Drainage Legend

Existing	Proposed
SW	Stormwater
	Cesspit
	Outlet/Inlet
	Private SW Line (P SW)
	Raingarden
	Dispersal T-Bar
	Retaining Wall
	Final Contours (35)

FOR ENGINEERING APPROVAL

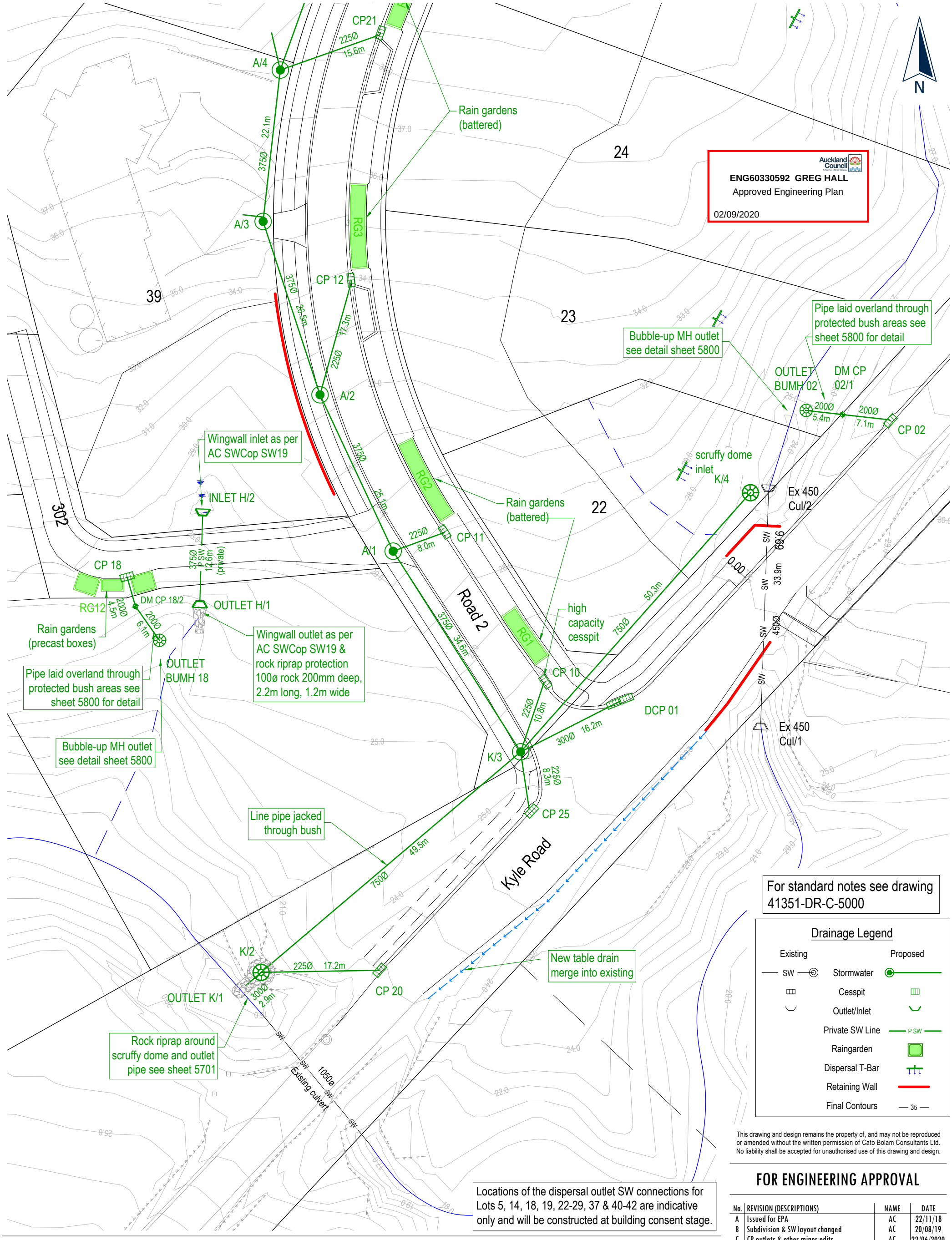
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision & SW layout changed	AC	20/08/19
C	CP outlets & other minor edits	AC	22/06/2020

SURVEYED			
DESIGNED		PJT	25/09/18
DRAWN		PJT	25/09/18
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
22/06/2020	1:1000	A3	
DRAWING NO.		REVISION	
41351-DR-C-5002		C	

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Layout
Sheet 2 of 3



FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision & SW layout changed	AC	20/08/19
C	CP outlets & other minor edits	AC	22/06/2020
SURVEYED			
DESIGNED		PJT	25/09/18
DRAWN		PJT	25/09/18

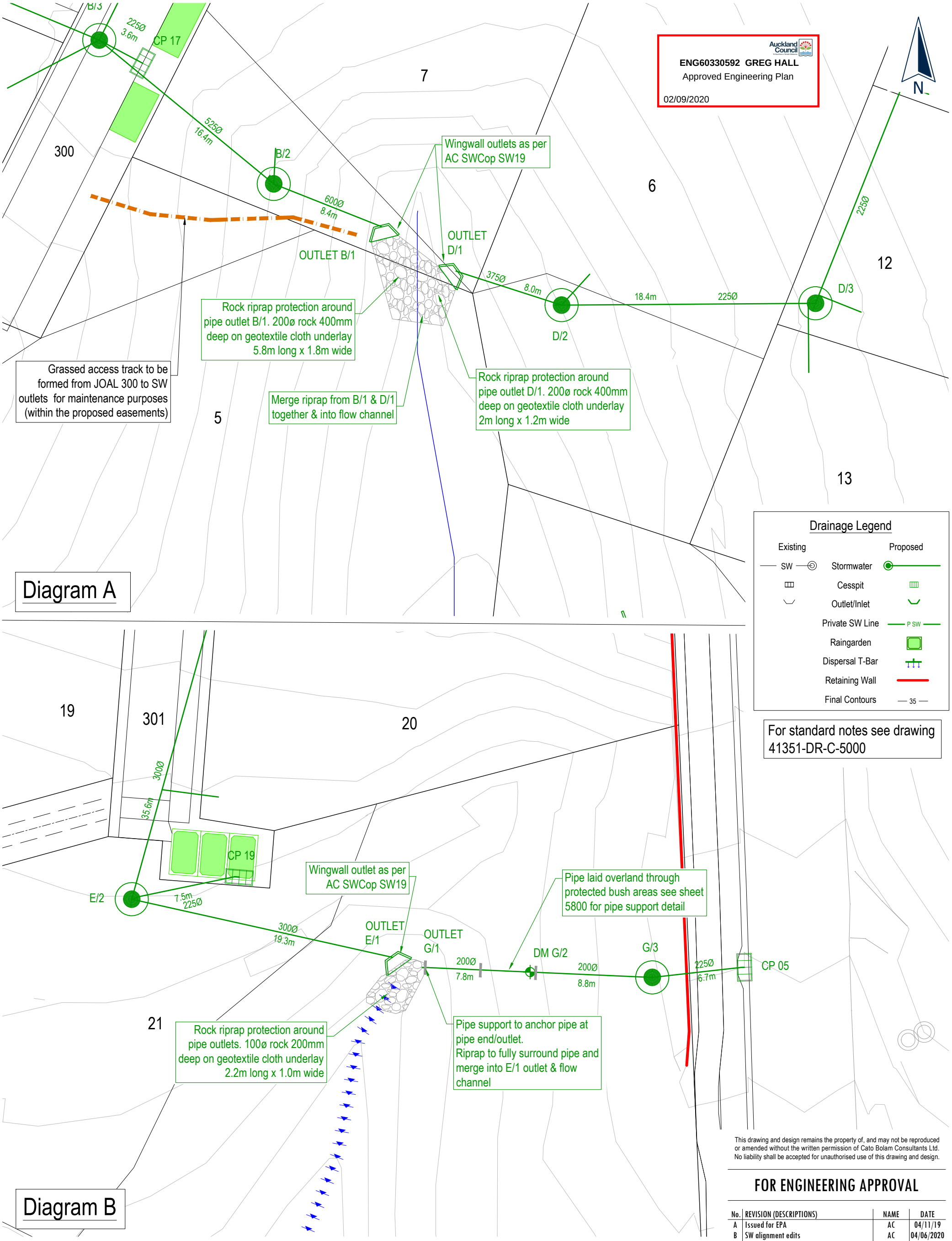
DATE	ORIGINAL SCALE	ORIGINAL SIZE
22/06/2020	1:500	A3

DRAWING NO. 41351-DR-C-5003 REVISION C

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Layout
Sheet 3 of 4



Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

N

Drainage Legend

Existing		Proposed
SW	Stormwater	
	Cesspit	
	Outlet/Inlet	
	Private SW Line	P SW
	Raingarden	
	Dispersal T-Bar	
	Retaining Wall	
	Final Contours	35

For standard notes see drawing 41351-DR-C-5000

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	04/11/19
B	SW alignment edits	AC	04/06/2020
C	Drive 2 RG's moved	AC	22/06/2020
SURVEYED			
DESIGNED		PJT	25/09/18
DRAWN		PJT	25/09/18

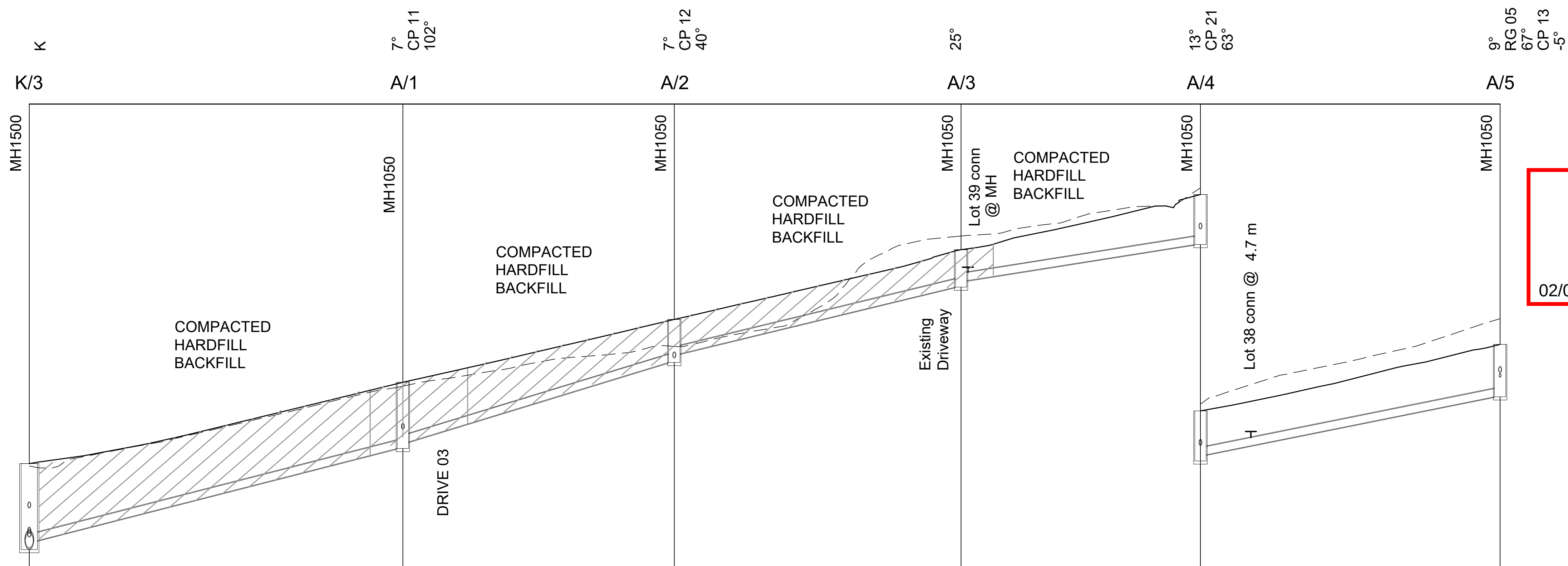
DATE	ORIGINAL SCALE	ORIGINAL SIZE
22/06/2020	1:250	A3

DRAWING NO. 41351-DR-C-5004 REVISION C

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Layout
Sheet 4 of 4



ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

	K/3 – A/1	A/1 – A/2	A/2 – A/3	A/3 – A/4	A/4 – A/5
GRADE %	12.32%	14.63%	11.62%	7.54%	9.66%
DESIGN FLOW	574l/s	557l/s	540l/s	514l/s	488l/s
FLOW CAPACITY	706l/s	769l/s	686l/s	553l/s	625l/s
PIPE SIZE (mm)	375	375	375	375	375
PIPE TYPE	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 2 RCRRJ
BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE
DATUM	5.000				15.000

	K/3		A/1		A/2		A/3		A/4		A/5
DEPTH TO INVERT	3.97 3.56		3.06 2.76		1.99 1.59		1.73 1.43		2.31 2.03		2.42
INVERT LEVEL	21.66 22.07		26.33 26.63		30.31 30.71		33.79 34.09		35.76 36.04		38.72
DESIGN SURFACE LEVEL	25.63		29.39		32.29		35.52		38.07		41.14
DISTANCE	0	34.55	34.55	25.1	59.65	26.52	86.18	22.14	108.32	27.71	136.03

STORMWATER LINE A

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 1 of 12

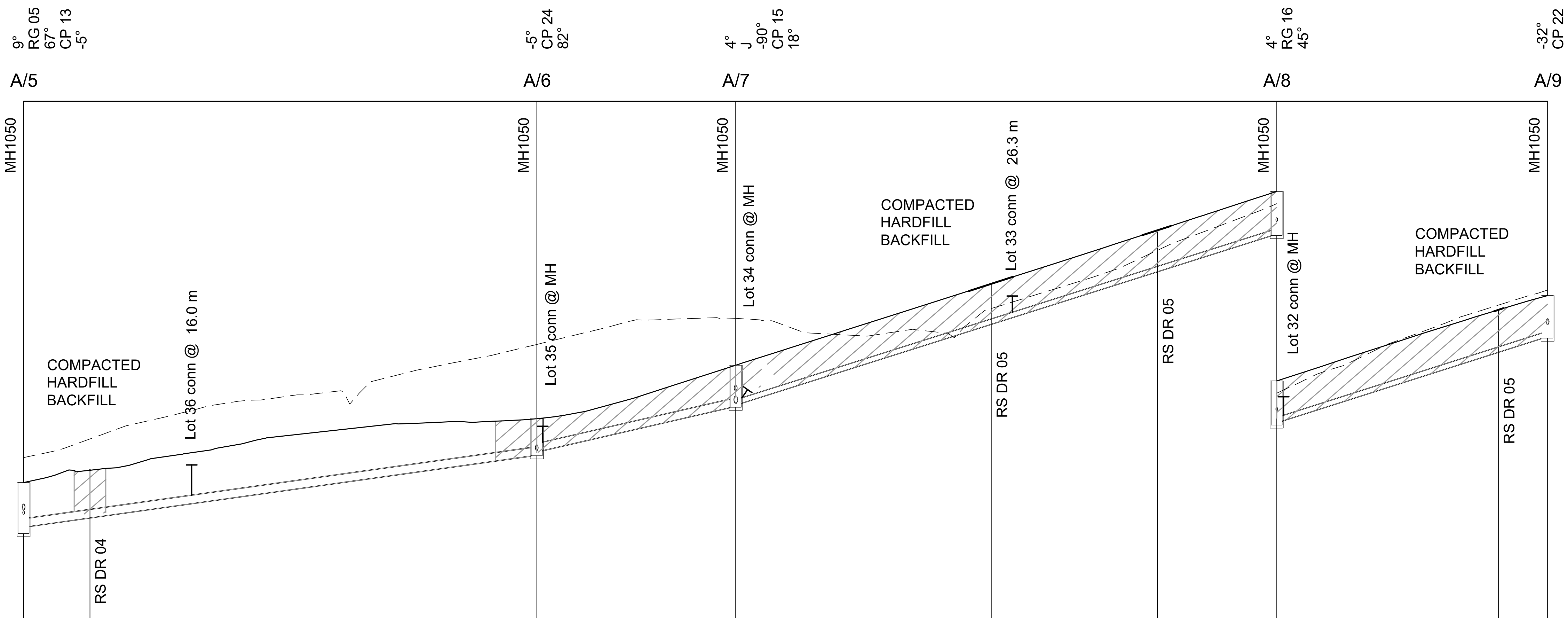
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO.	REVISION
41351-DR-C-5100	C



	A/5 – A/6	A/6 – A/7	A/7 – A/8	A/8 – A/9
GRADE %	6.86%	10.85%	15.48%	15.25%
DESIGN FLOW	473l/s	427l/s	78l/s	39l/s
FLOW CAPACITY	527l/s	663l/s	206l/s	205l/s
PIPE SIZE (mm)	375	375	225	225
PIPE TYPE	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-23 7MPa LOW STRENGTH CONCRETE
DISTANCE	48.77	18.91	51.41	25.74

DATUM 22.000 (A/5 – A/8); 31.000 (A/8 – A/9)

Point	DEPTH TO INVERT	INVERT LEVEL	DESIGN SURFACE LEVEL	DISTANCE
A/5	2.42 / 2.07	38.72 / 39.07	41.14	136.03
RS DR 04		39.47		6.3
A/6	1.76 / 1.51	42.41 / 42.66	44.17	184.8
A/7	2.00 / 1.80	44.72 / 44.92	46.72	203.7
RS DR 05		48.67		24.1
RS DR 05		51.17		40.1
A/8	2.09 / 1.89	52.87 / 53.07	54.97	255.12
RS DR 05		56.34		21.1
A/9	2.02	57.00	59.02	280.86

STORMWATER LINE A

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 2 of 12

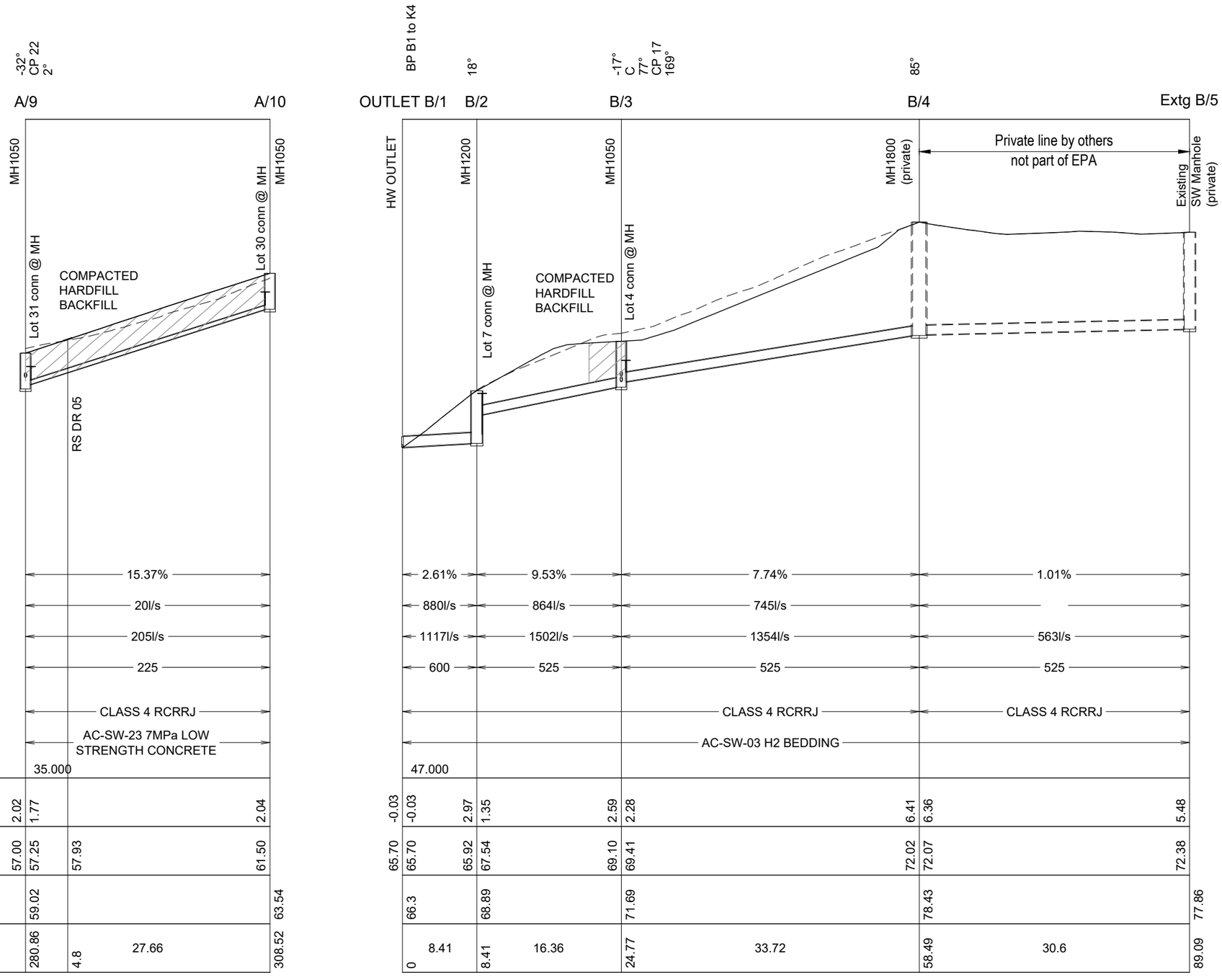
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE 17/06/2020 | ORIGINAL SCALE H 1:500 V 1:250 | ORIGINAL SIZE A3

DRAWING NO. 41351-DR-C-5101 | REVISION C



STORMWATER LINE A

STORMWATER LINE B

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

Cato Bolam

creating great places

PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 3 of 12

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Line B extended to existing MH	AC	17/02/2020
D	Line B4 - B5 labeled as outside EPA	AC	01/05/2020
E	MH B4 edit size & made private	AC	04/06/2020
F	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5102

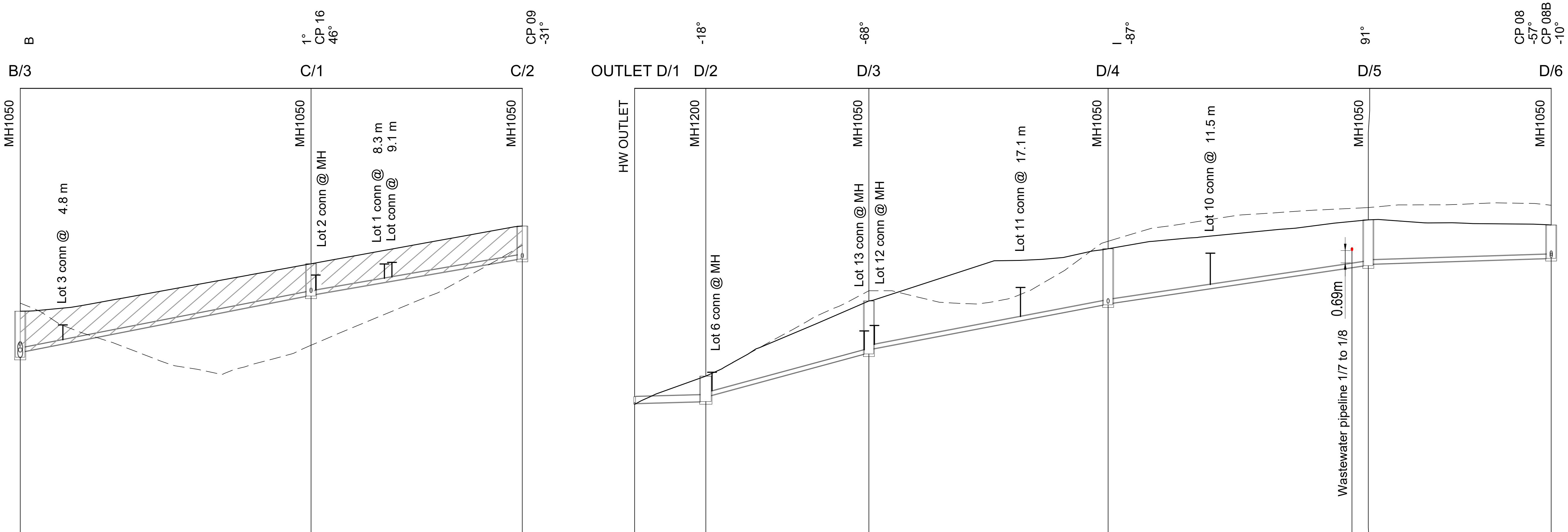
REVISION F

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020



STORMWATER LINE C

	B/3 – C/1	C/1 – C/2
GRADE %	9.51%	8.29%
DESIGN FLOW	84l/s	56l/s
FLOW CAPACITY	162l/s	151l/s
PIPE SIZE (mm)	225	225
PIPE TYPE	CLASS 4 RCRRJ	CLASS 4 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING

DATUM 47.000

	B/3		C/1		C/2
DEPTH TO INVERT	2.59 / 2.26		1.82 / 1.72		1.87
INVERT LEVEL	69.10 / 69.43		72.55 / 72.65		74.62
DESIGN SURFACE LEVEL	71.69		74.37		76.49
DISTANCE	0	32.77	32.77	23.8	56.57

STORMWATER LINE D

	D/1 – D/2	D/2 – D/3	D/3 – D/4	D/4 – D/5	D/5 – D/6
GRADE %	1.25%	12.71%	9.16%	7.17%	1.52%
DESIGN FLOW	122l/s	102l/s	79l/s	40l/s	30l/s
FLOW CAPACITY	225l/s	187l/s	159l/s	140l/s	65l/s
PIPE SIZE (mm)	375	225	225	225	225
PIPE TYPE	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 2 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING

DATUM 46.000

	D/1		D/2		D/3		D/4			D/5		D/6
DEPTH TO INVERT	-0.02 / -0.06		1.44 / 1.09		2.98 / 2.68		3.16 / 3.06		2.59	2.49		1.88
INVERT LEVEL	65.46 / 65.50		65.60 / 65.95		68.29 / 68.59		71.05 / 71.15		73.26	73.36		73.67
DESIGN SURFACE LEVEL	65.88		67.04		71.27		74.21			75.84		75.55
DISTANCE	-11.11	8.02	-3.09	18.38	15.29	26.95	42.24	29.32	27.5	71.56	20.6	92.17

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 4 of 12

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	All of line C now on this sheet	AC	01/05/2020
D	Drainage alignment edits	AC	04/06/2020
C	Minor edits for EPA	AC	17/06/2020

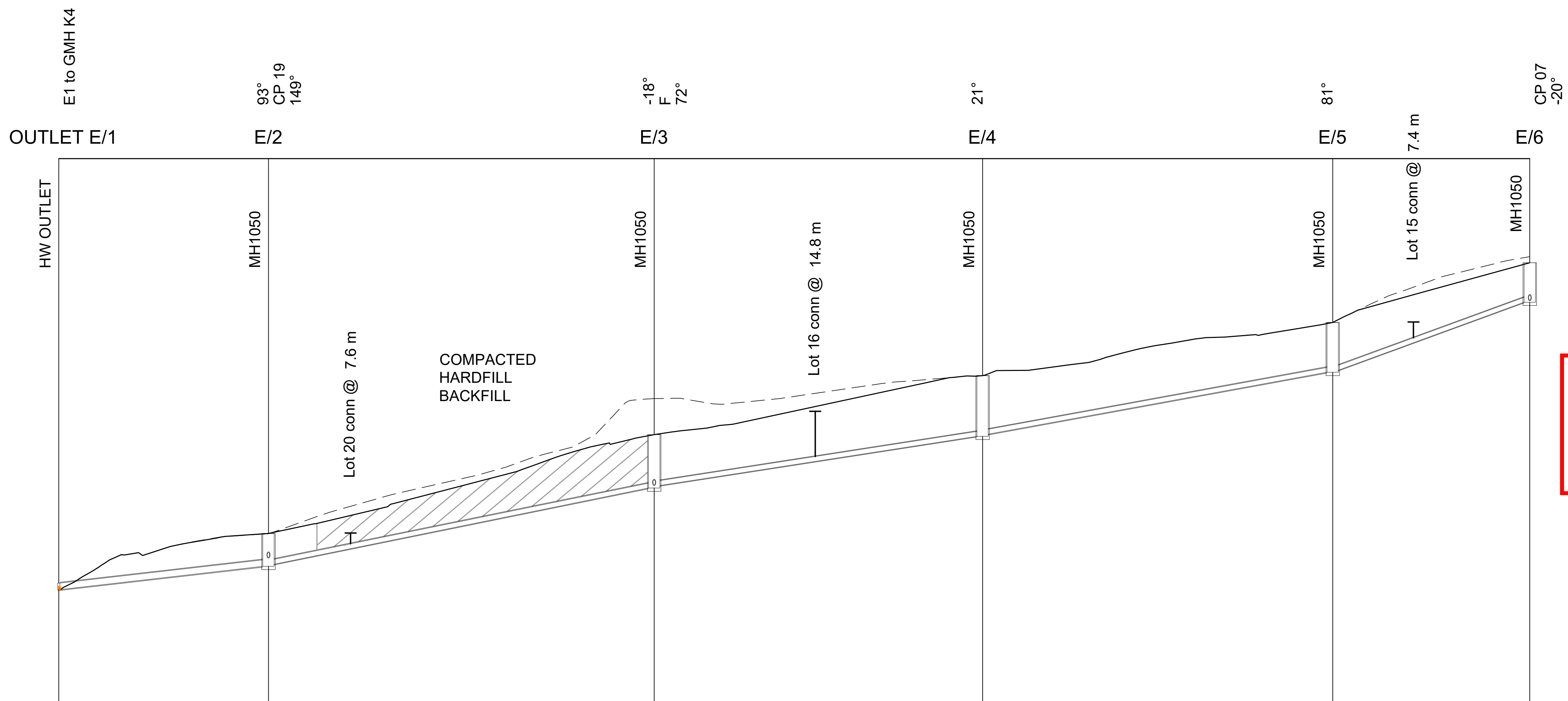
FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5103

REVISION E



	E/1 – E/2	E/2 – E/3	E/3 – E/4	E/4 – E/5	E/5 – E/6
GRADE %	5.53%	9.87%	7.48%	8.83%	17.23%
DESIGN FLOW	163l/s	134l/s	84l/s	73l/s	51l/s
FLOW CAPACITY	263l/s	351l/s	143l/s	156l/s	218l/s
PIPE SIZE (mm)	300	300	225	225	225
PIPE TYPE	CLASS 2 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 3 RCRRJ	CLASS 4 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE
DISTANCE (segment)	19.33	35.56	30.27	32.28	18.17

DATUM 40.000

	E/1	E/2	E/3	E/4	E/5	E/6
DEPTH TO INVERT	-0.06 / -0.06	1.51 / 1.41	2.46 / 2.34	2.80 / 2.70	2.30 / 2.20	1.82
INVERT LEVEL	57.39 / 57.39	58.46 / 58.56	62.07 / 62.19	64.45 / 64.55	67.40 / 67.50	70.63
DESIGN SURFACE LEVEL	57.69	59.97	64.53	67.25	69.7	72.45
DISTANCE	0	19.33	54.89	85.17	117.44	135.61

STORMWATER LINE E

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 5 of 12

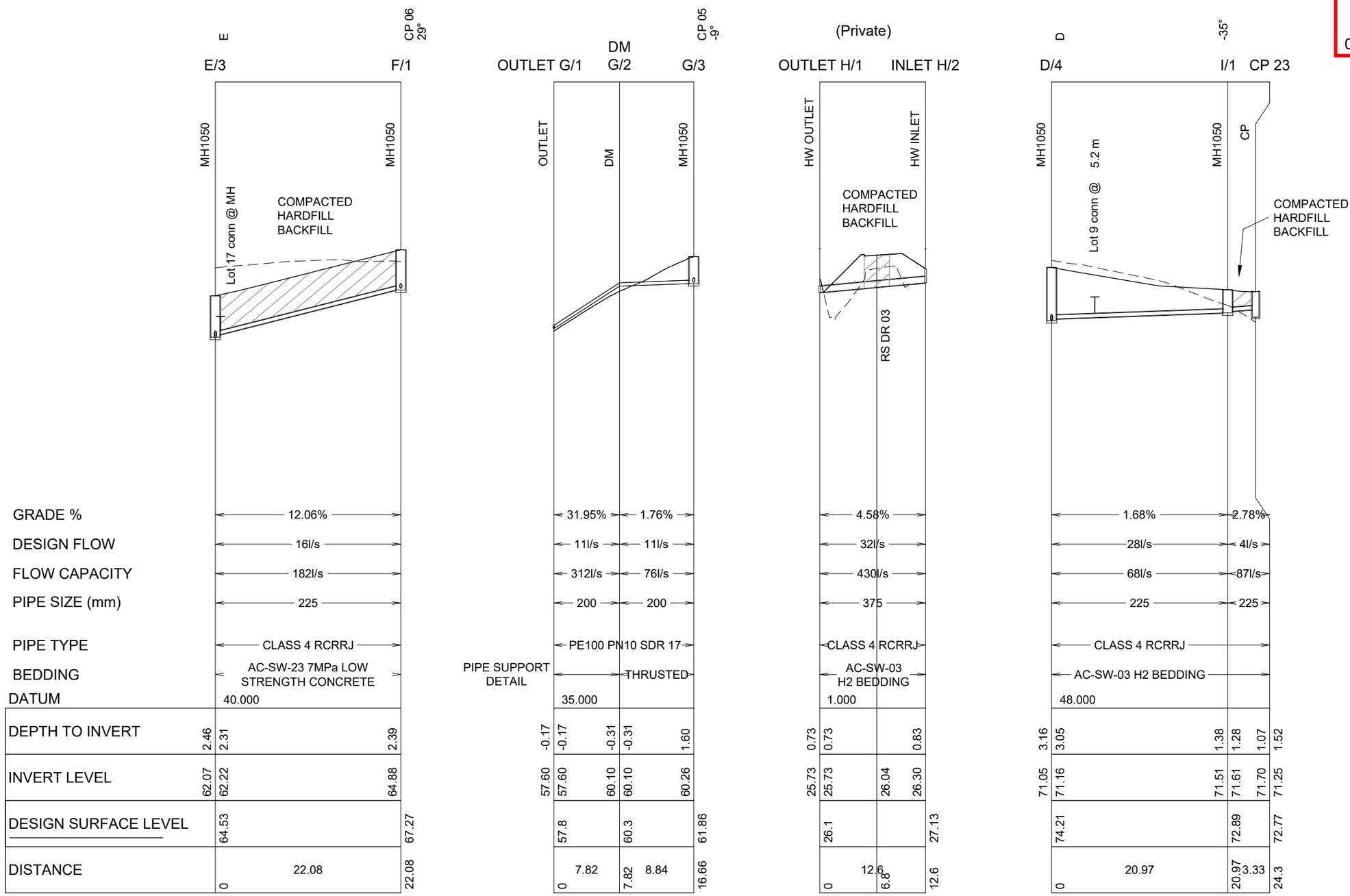
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Drainage alignment edits	AC	04/06/2020
D	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO.	REVISION
41351-DR-C-5104	D



STORMWATER LINE F

STORMWATER LINE G

STORMWATER LINE H

STORMWATER LINE I

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 6 of 12

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Drainage alignment edits	AC	04/06/2020
D	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

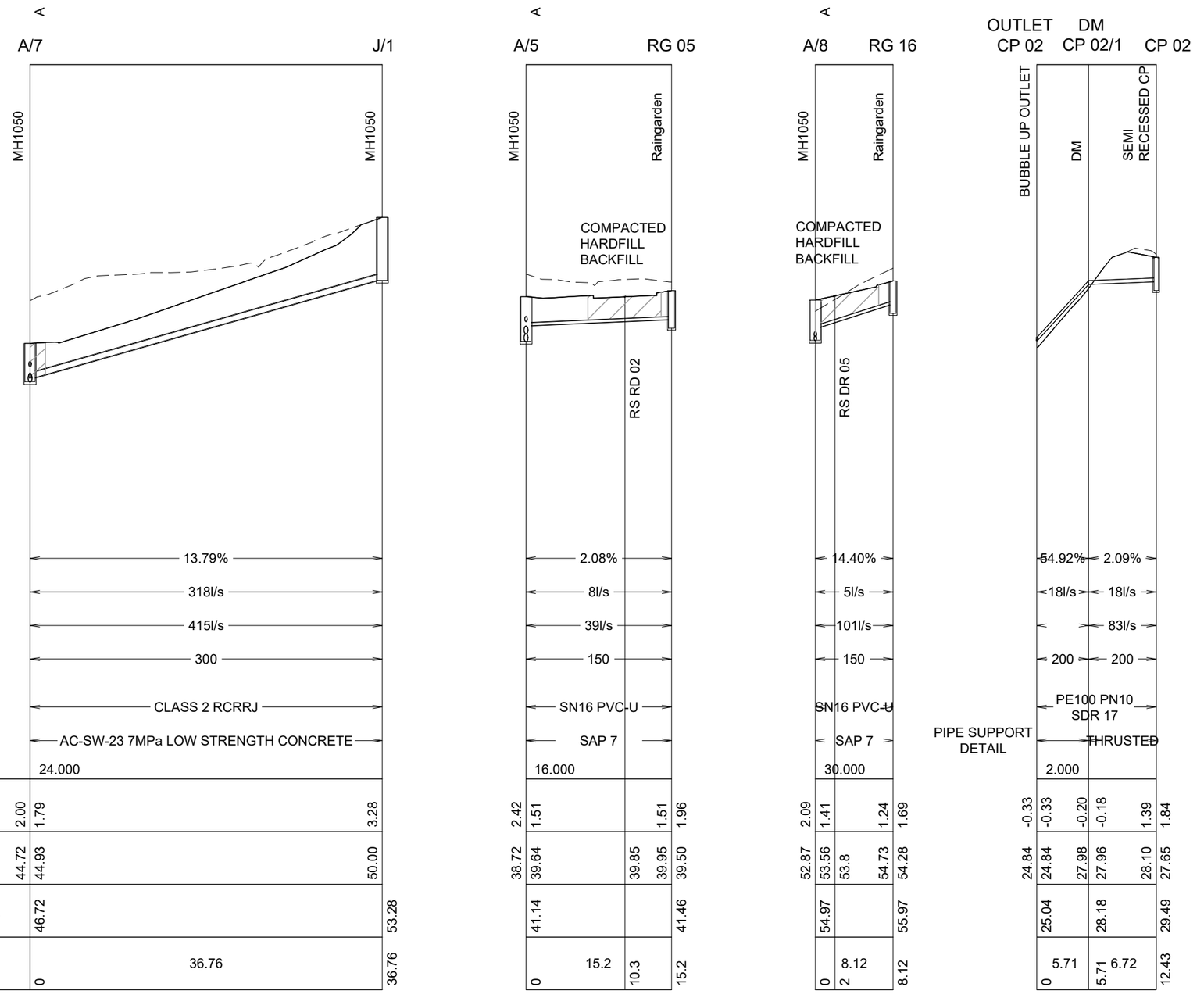
	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
04/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5105

REVISION D

For line K longsection
see plan 5700



GRADE %
DESIGN FLOW
FLOW CAPACITY
PIPE SIZE (mm)
PIPE TYPE
BEDDING
DATUM
DEPTH TO INVERT
INVERT LEVEL
DESIGN SURFACE LEVEL
DISTANCE

STORMWATER LINE J | STORMWATER LINE RG 05 | STORMWATER LINE RG 16 | STORMWATER LINE CP 02

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 7 of 12

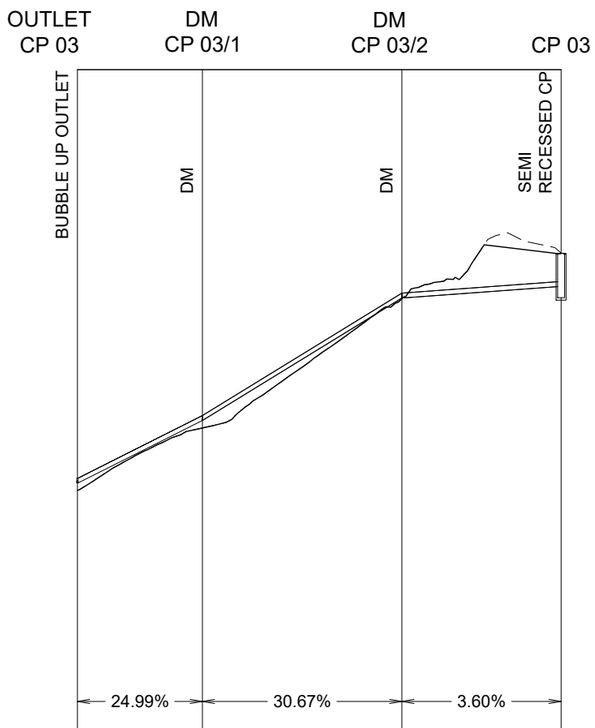
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

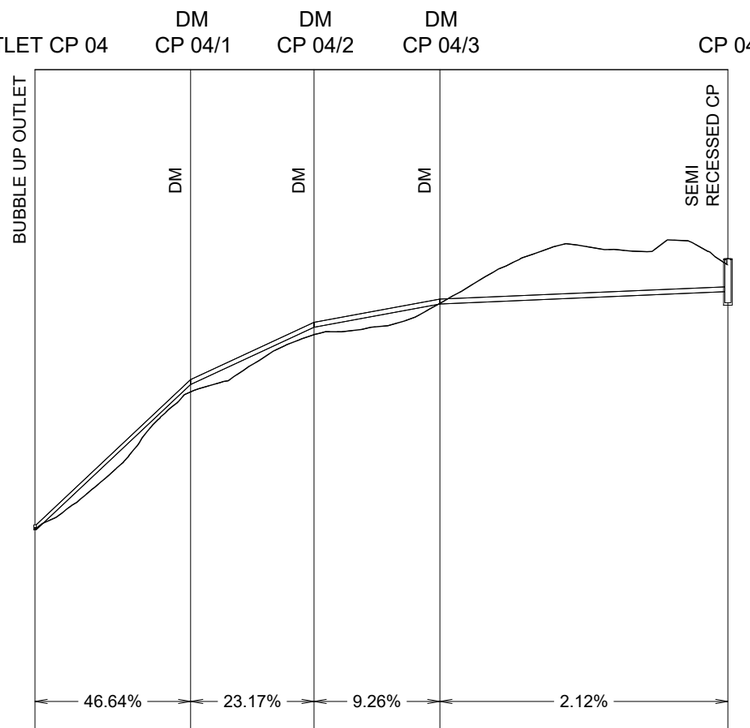
DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5106
REVISION C



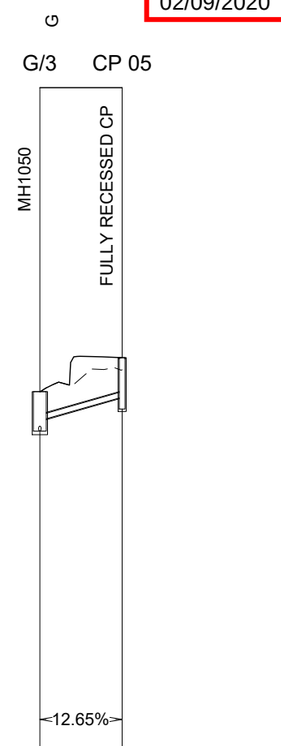
GRADE %		24.99%			30.67%			3.60%		
DESIGN FLOW		23l/s			23l/s			23l/s		
FLOW CAPACITY								108l/s		
PIPE SIZE (mm)		200			200			200		
PIPE TYPE		PE100 PN10 SDR 17			PE100 PN10 SDR 17			PE100 PN10 SDR 17		
BEDDING		PIPE SUPPORT DETAIL			PIPE SUPPORT DETAIL			THRUSTED		
DATUM		10.000								
DEPTH TO INVERT	-0.30	-0.30		-0.31	-0.31		-0.02	-0.02		1.35	1.80
INVERT LEVEL	30.40	30.40		32.95	32.95		37.94	37.94		38.41	37.96
DESIGN SURFACE LEVEL		30.6			33.15			38.14			39.76
DISTANCE	0	10.19			10.19	16.27		26.45	12.98		39.44

STORMWATER LINE CP 03



GRADE %		46.64%			23.17%			9.26%		2.12%
DESIGN FLOW		23l/s			23l/s			23l/s		23l/s
FLOW CAPACITY										84l/s
PIPE SIZE (mm)		200			200			200		200
PIPE TYPE		PE100 PN10 SDR 17								
BEDDING		PIPE SUPPORT DETAIL								THRUSTED
DATUM		24.000								
DEPTH TO INVERT	0.02	0.02		-0.30	-0.30		-0.30	-0.30		0.02	1.35	1.80
INVERT LEVEL	42.50	42.50		48.42	48.42		50.75	50.75		51.70	51.75	52.20
DESIGN SURFACE LEVEL		42.7			48.62			50.95		51.9		53.54
DISTANCE	0	12.69			12.69	10.06		22.75	10.26		33.01	23.49	56.5

STORMWATER LINE CP 04



GRADE %		12.65%		
DESIGN FLOW		11l/s		
FLOW CAPACITY		186l/s		
PIPE SIZE (mm)		225		
PIPE TYPE		CLASS 4 RCRRJ		
BEDDING		AC-SW-23 7MPa LOW STRENGTH CONCRETE		
DATUM		37.000		
DEPTH TO INVERT	1.60	1.10	1.65	2.10
INVERT LEVEL	60.26	60.76	61.60	61.15
DESIGN SURFACE LEVEL		61.86		63.25
DISTANCE	0	6.71		6.71

STORMWATER LINE CP 05

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 8 of 12

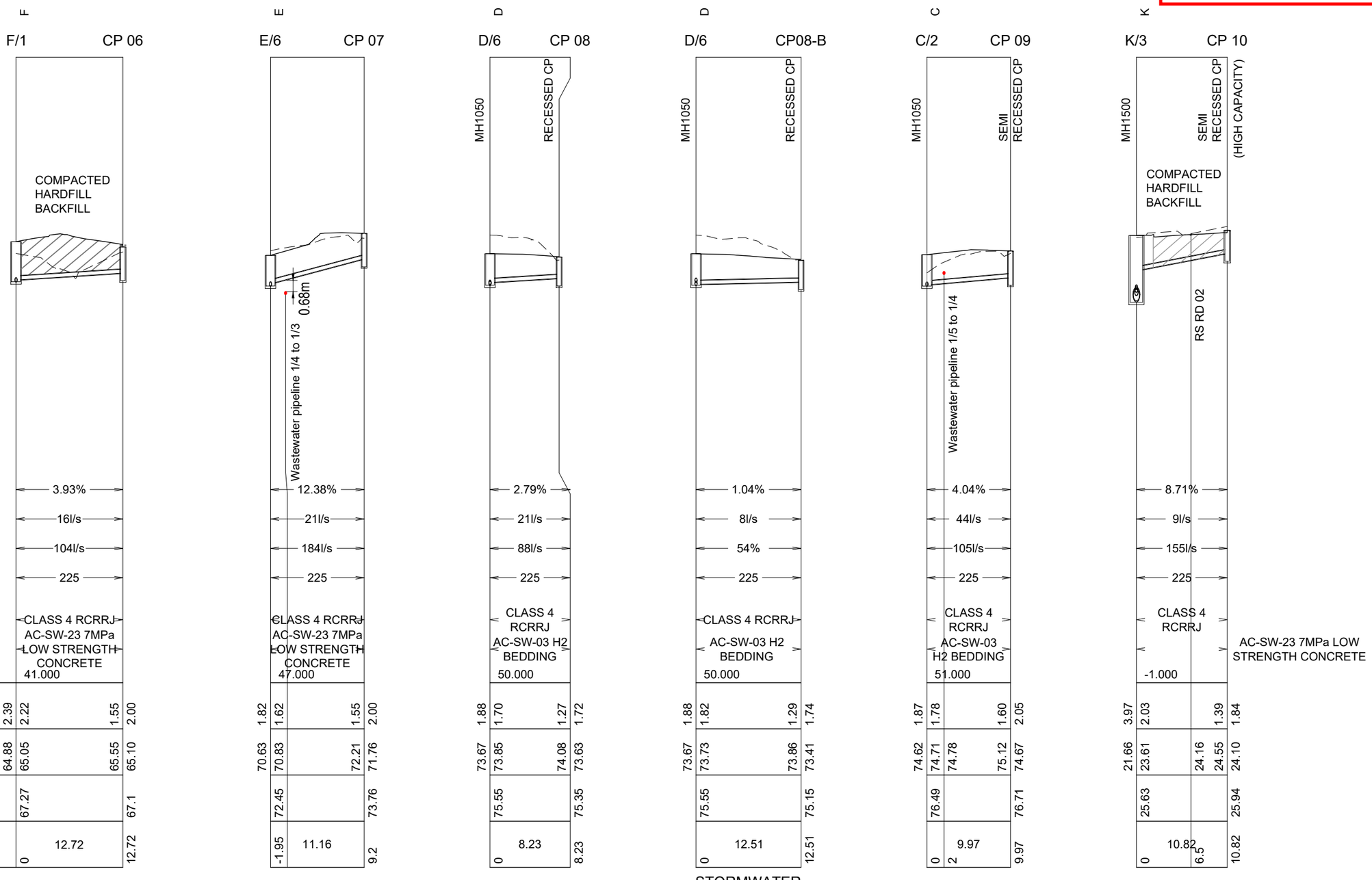
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5107
REVISION C



STORMWATER LINE CP 06 | STORMWATER LINE CP 07 | STORMWATER LINE CP 08 | STORMWATER LINE CP 08B | STORMWATER LINE CP 09 | STORMWATER LINE CP 10

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 9 of 12

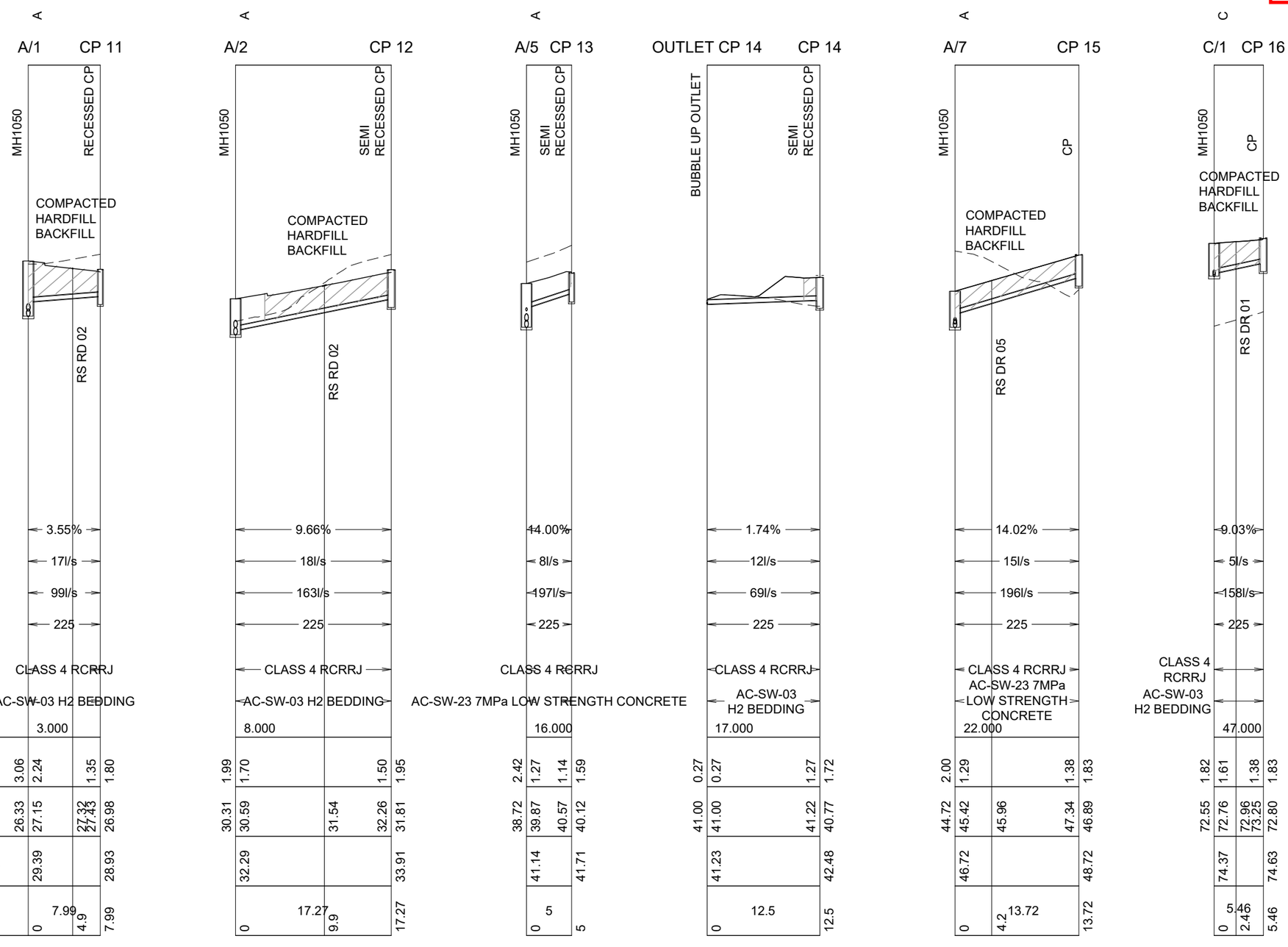
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Swales removed CPs 7, 8, 9 edits	AC	01/05/2020
D	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5108
REVISION D



	CP 11	CP 12	CP 13	CP 14	CP 15	CP 16
GRADE %	3.55%	9.66%	14.00%	1.74%	14.02%	9.03%
DESIGN FLOW	17l/s	18l/s	8l/s	12l/s	15l/s	5l/s
FLOW CAPACITY	99l/s	163l/s	197l/s	69l/s	196l/s	158l/s
PIPE SIZE (mm)	225	225	225	225	225	225
PIPE TYPE	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ	CLASS 4 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-03 H2 BEDDING	AC-SW-23 7MPa LOW STRENGTH CONCRETE	AC-SW-03 H2 BEDDING
DATUM	3.000	8.000	16.000	17.000	22.000	47.000
DEPTH TO INVERT	3.06 / 2.24 / 1.35 / 1.80	1.99 / 1.70 / 1.50 / 1.95	2.42 / 1.27 / 1.14 / 1.59	0.27 / 0.27 / 1.27 / 1.72	2.00 / 1.29 / 1.38 / 1.83	1.82 / 1.61 / 1.38 / 1.83
INVERT LEVEL	26.33 / 27.15 / 27.32 / 27.43 / 26.98	30.31 / 30.59 / 31.54 / 32.26 / 31.81	38.72 / 39.87 / 40.57 / 40.12	41.00 / 41.00 / 41.22 / 40.77	44.72 / 45.42 / 45.96 / 47.34 / 46.89	72.55 / 72.76 / 72.96 / 73.25 / 72.80
DESIGN SURFACE LEVEL	29.39 / 28.93	32.29 / 33.91	41.14 / 41.71	41.23 / 42.48	46.72 / 48.72	74.37 / 74.63
DISTANCE	0 / 7.99 / 4.9 / 7.99	0 / 17.27 / 9.9 / 17.27	0 / 5 / 5	0 / 12.5 / 12.5	0 / 4.2 / 13.72 / 13.72	0 / 5.46 / 2.46 / 5.46
	STORMWATER LINE CP 11	STORMWATER LINE CP 12	STORMWATER LINE CP 13	STORMWATER LINE CP 14	STORMWATER LINE CP 15	STORMWATER LINE CP 16

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 10 of 12

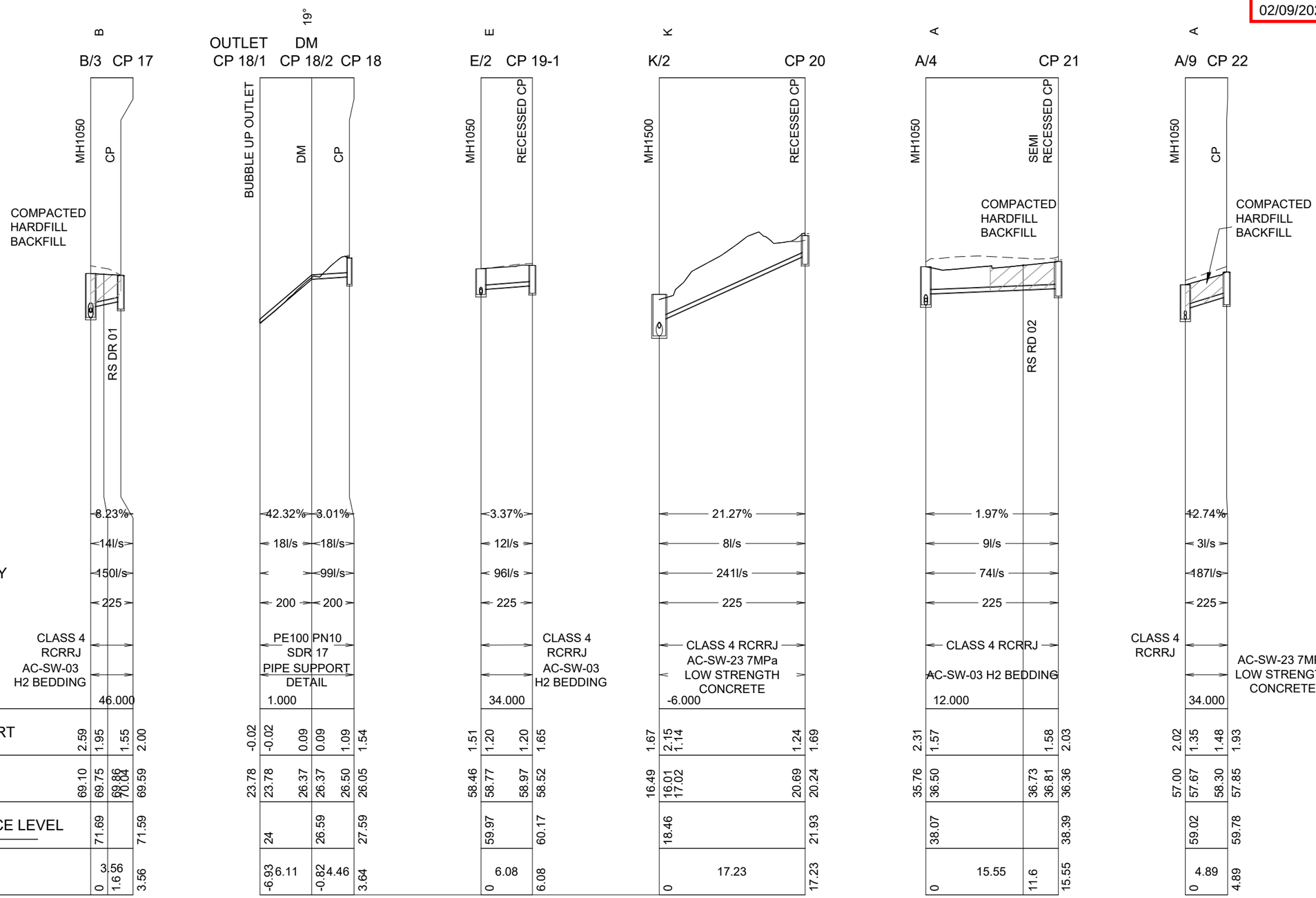
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO.	REVISION
41351-DR-C-5109	C



STORMWATER LINE CP 17 STORMWATER LINE CP 18 STORMWATER LINE CP 19 STORMWATER LINE CP 20 STORMWATER LINE CP 21 STORMWATER LINE CP 22

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 11 of 12

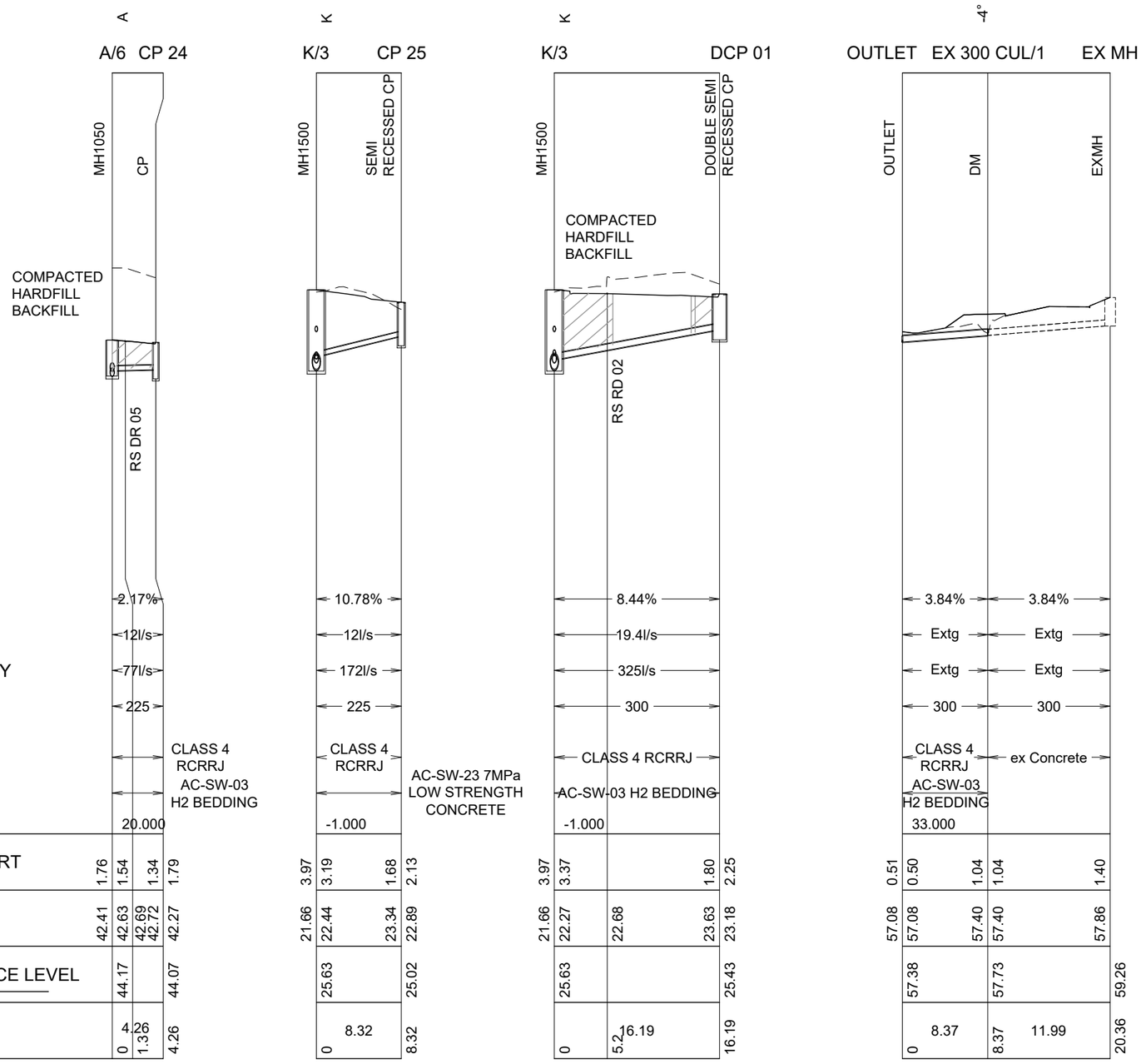
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	TM	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	07/09/18
DRAWN	PJT	07/09/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

DRAWING NO. 41351-DR-C-5110
REVISION C



STORMWATER LINE CP 24 STORMWATER LINE CP 25 STORMWATER LINE DCP 01 STORMWATER LINE Ex 300 Culvert

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Longsections
Sheet 12 of 12

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	23/09/19
B	New sheet	AC	04/11/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

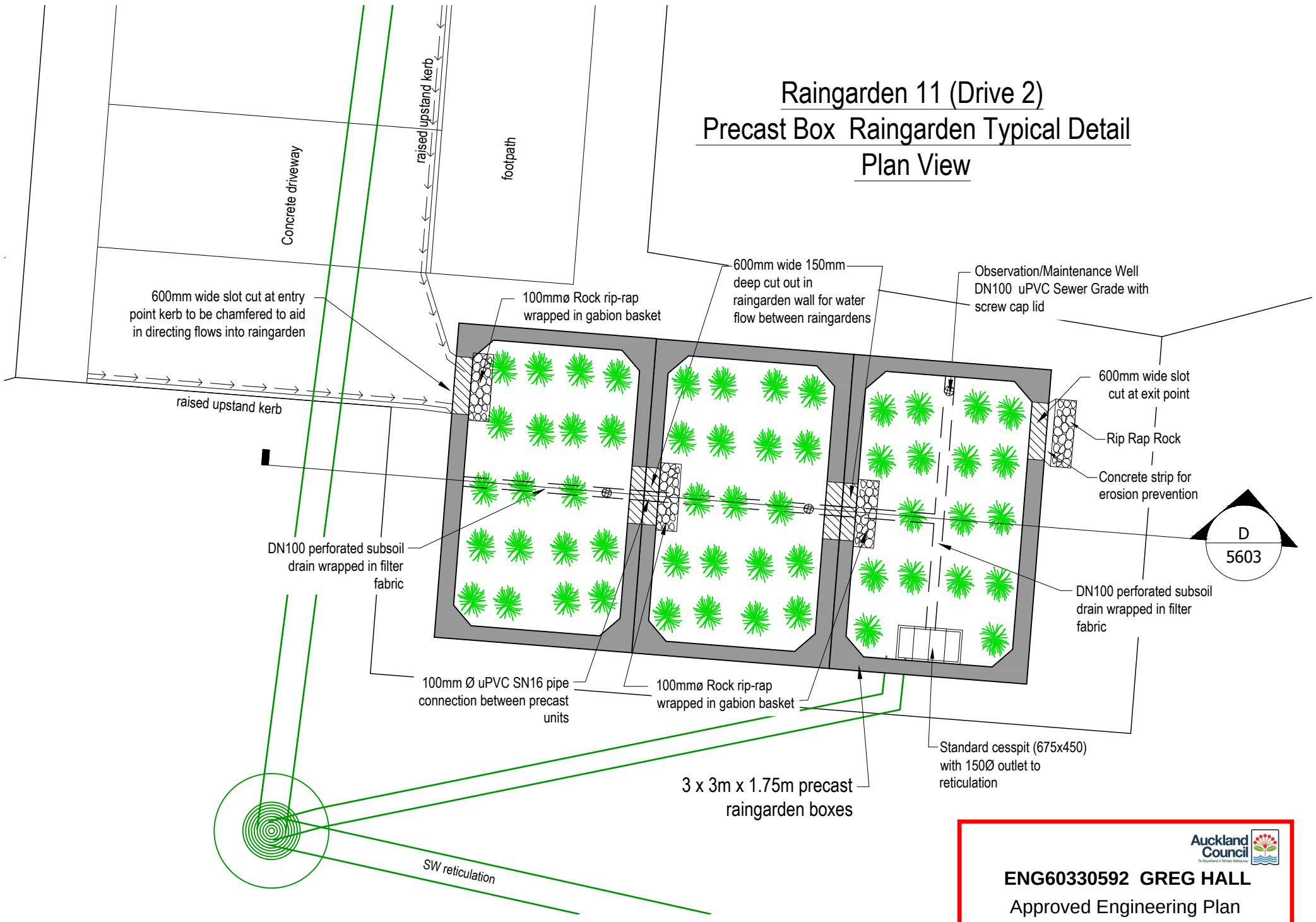
	NAME	DATE
SURVEYED		
DESIGNED	PJT	18/09/19
DRAWN	PJT	18/09/19

DATE	ORIGINAL SCALE	ORIGINAL SIZE
17/06/2020	H 1:500 V 1:250	A3

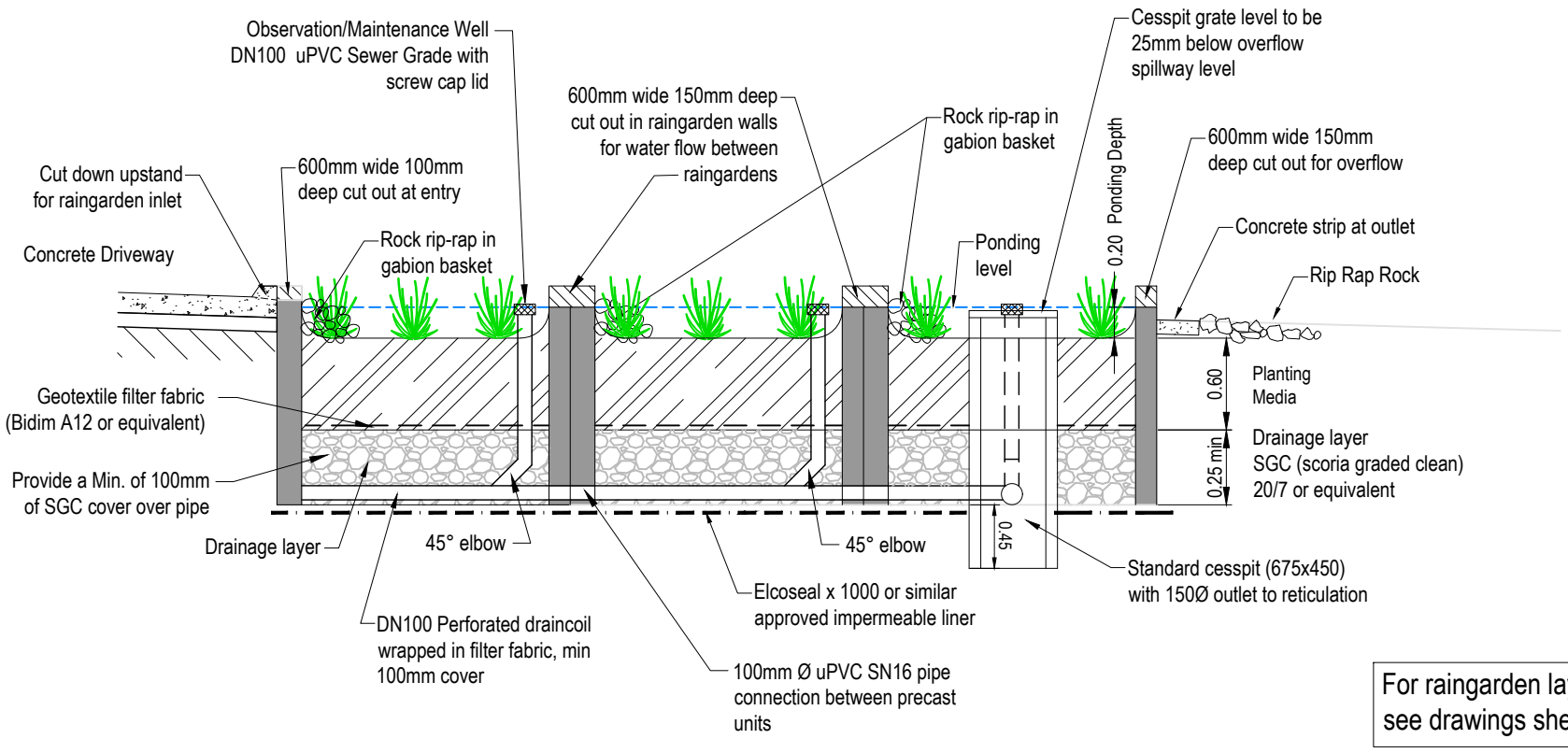
DRAWING NO. 41351-DR-C-5111

REVISION C

Raingarden 11 (Drive 2)
Precast Box Raingarden Typical Detail
Plan View



ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020



For raingarden layout and sizing see drawings sheets 5010 & 5011

Raingarden 11 - Precast Box Raingarden Typical Detail
Section D-D

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	18/11/19
B	RG entry edits	AC	22/06/2020
SURVEYED			
DESIGNED		AC	06/09/19
DRAWN		AC	18/11/19

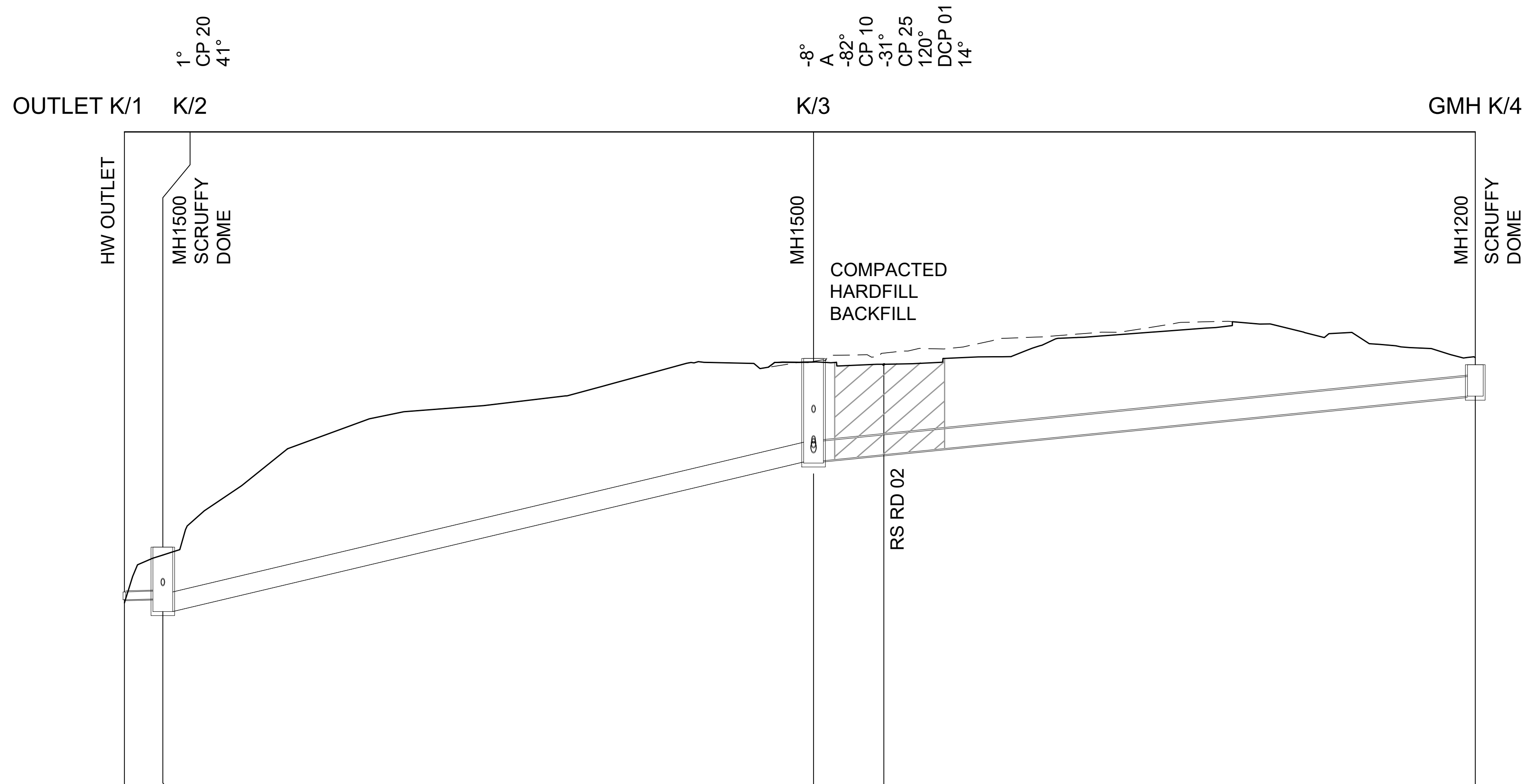
DATE	ORIGINAL SCALE	ORIGINAL SIZE
22/06/2020	1:50	A3

DRAWING NO.	REVISION
41351-DR-C-5603	B

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Rain Garden Typical Details
Raingarden 11 - Drive 2

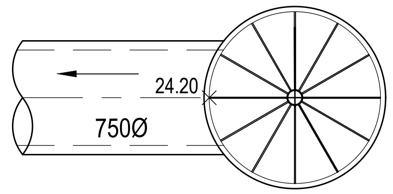


	K/1 – K/2	K/2 – K/3	K/3 – K/4
GRADE %	1.00%	11.42%	4.87%
DESIGN FLOW	1871l/s	1871l/s	1256l/s
FLOW CAPACITY	115l/s	4187l/s	2737l/s
PIPE SIZE (mm)	300	750	750
PIPE TYPE	CLASS 4 RCRRJ	RCFJ	CLASS 4 RCRRJ
BEDDING	AC-SW-03 H2 BEDDING	PIPE JACKED	AC-SW-03 H2 BEDDING

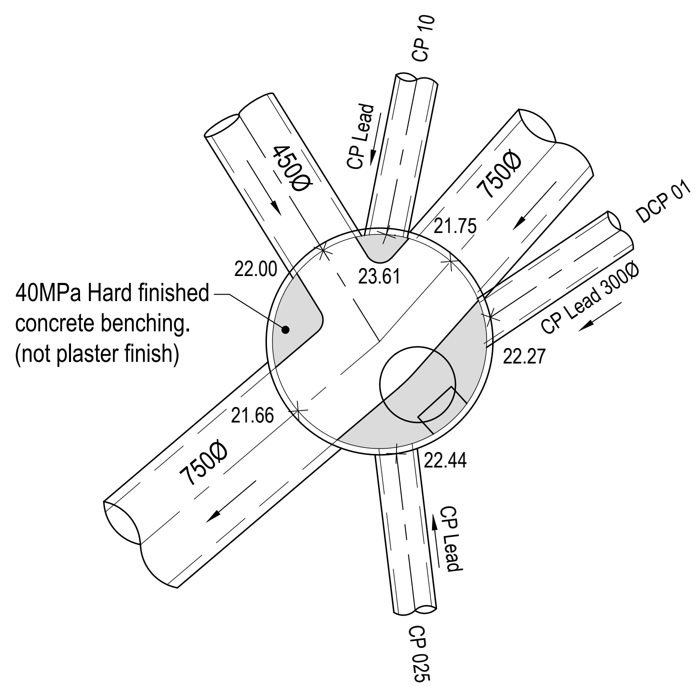
DATUM -3.000

DEPTH TO INVERT	-0.12	-0.12	1.67	2.15 / 2.15	3.97	3.88		1.47	
INVERT LEVEL	16.46	16.46	16.49	16.01 / 16.01	21.66	21.75	21.98	24.20	
DESIGN SURFACE LEVEL		16.76		18.46		25.63			25.4
DISTANCE		0	2.92	2.92	49.49	52.42	5.3	50.33	102.75

STORMWATER LINE K



Scruffy Dome Detail
K/4 1200Ø
Scale 1:50



Manhole Detail
K/3 1500Ø
Scale 1:50

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Bypass Detail
(Line K - longsection)
& Manhole Details

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	MF	09/07/19
C	Minor edits for EPA	AC	17/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	PJT	03/10/18
DRAWN	PJT	03/10/18

DATE: 17/06/2020 | ORIGINAL SCALE: H 1:500 V 1:250 | ORIGINAL SIZE: A3

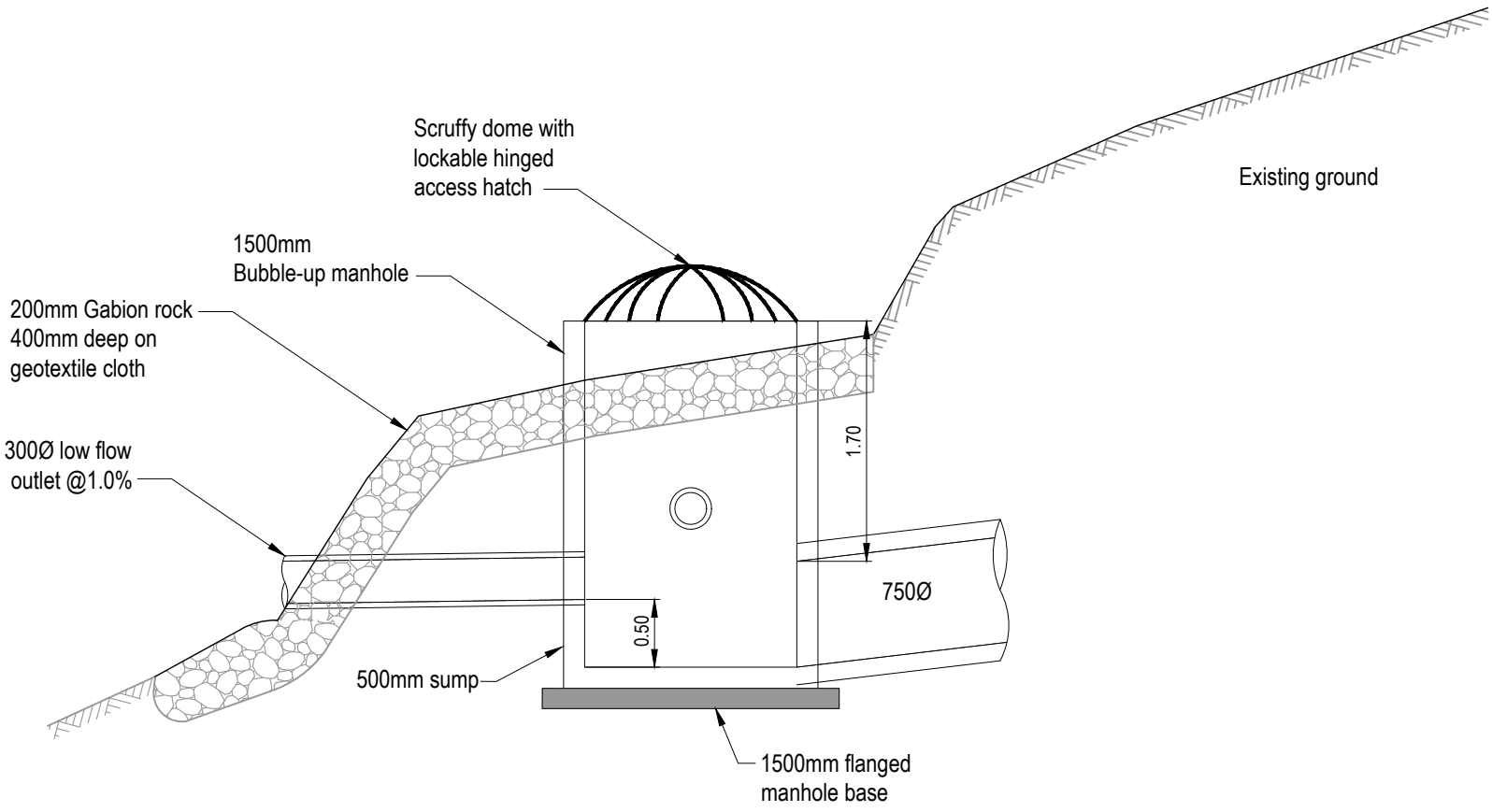
DRAWING NO. 41351-DR-C-5700 | REVISION C

Auckland Council

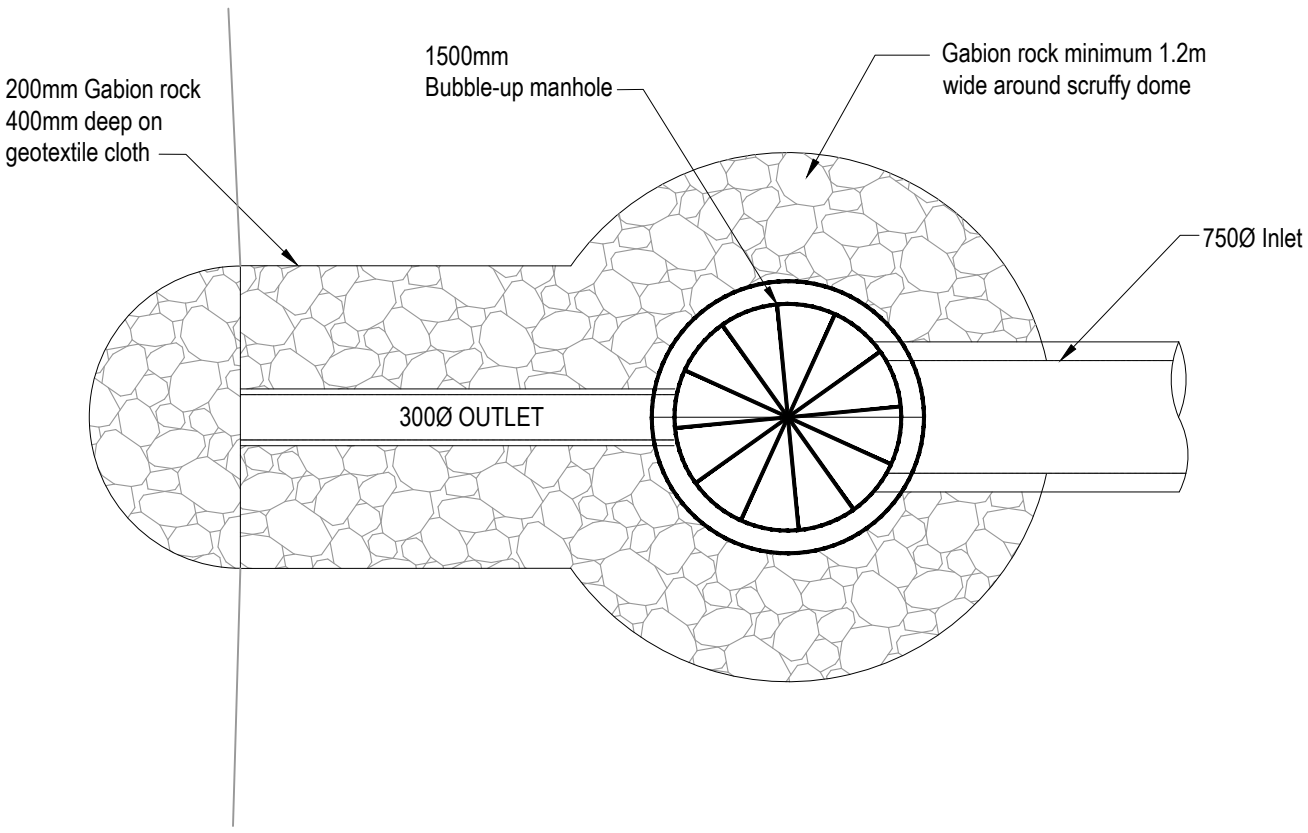
ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020



Stream Outlet Section
Scruffy Dome K/2



Stream Outlet Plan
Scruffy Dome K/2

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	MF	09/07/19
C	Hinged lid on scruffy dome	AC	19/06/2020
SURVEYED			
DESIGNED		AC	10/08/18
DRAWN		PJT	03/10/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
19/06/2020	1:50	A3

DRAWING NO.	REVISION
41351-DR-C-5701	C

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

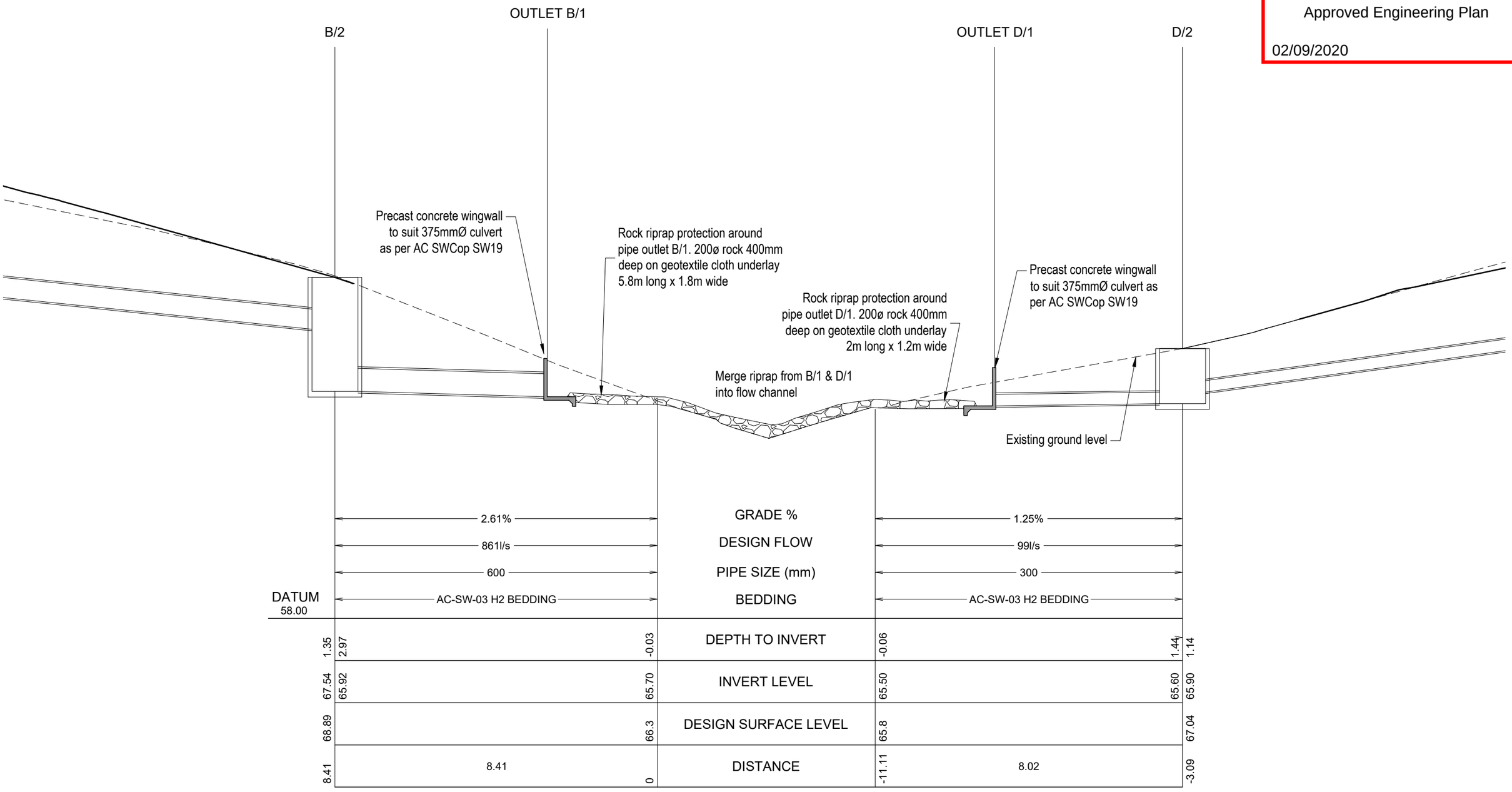
Stream Stormwater
Outlet Details

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020



Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Outlet Detail
Lines B & D

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Engineering approval	AC	14/11/19
B	D/1 outlet rock chnaged	AC	19/06/2020

FOR ENGINEERING APPROVAL

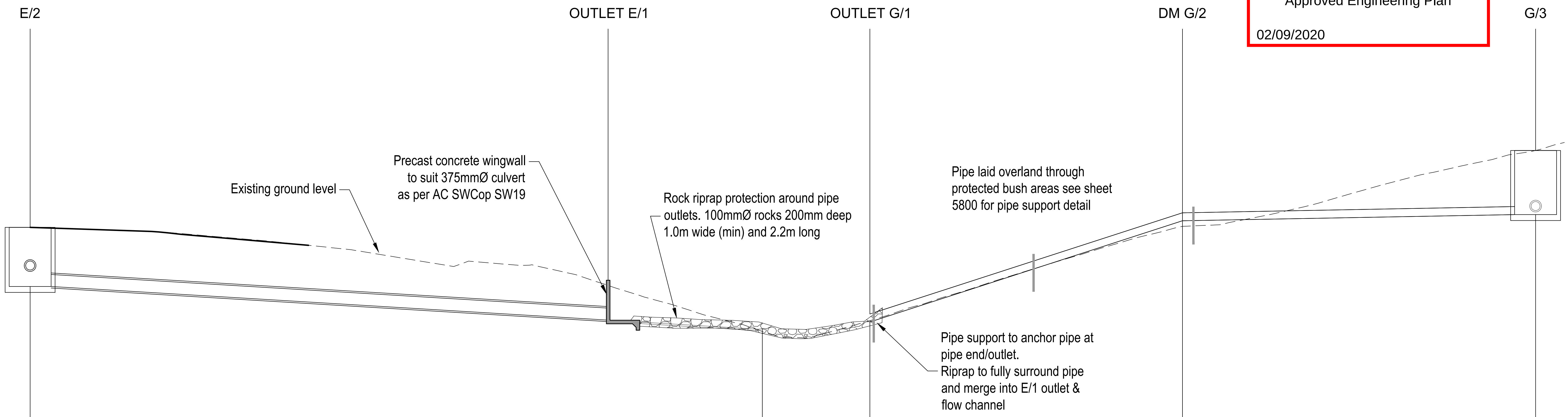
	NAME	DATE
SURVEYED		
DESIGNED	AC	04/11/19
DRAWN	AC	04/11/19

DATE	ORIGINAL SCALE	ORIGINAL SIZE
19/06/2020	H 1:100 V 1:100	A3

DRAWING NO. 41351-DR-C-5702

REVISION B

ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020



	STORMWATER LINE E (E/2 – OUTLET E/1)	STORMWATER LINE G (OUTLET G/1 – DM G/2)	STORMWATER LINE G (DM G/2 – G/3)
GRADE %	5.83%	31.95%	1.76%
DESIGN FLOW	96l/s	14l/s	14l/s
PIPE SIZE (mm)	300	200	200
PIPE TYPE	CLASS 2 RCRRJ	PE100 PN10 SDR 17	PE100 PN10 SDR 17
BEDDING	AC-SW-03 H2 BEDDING	PIPE SUPPORT DETAIL	THRUSTED
DATUM	50.00	50.00	

	E/2	OUTLET E/1		OUTLET G/1		DM G/2		G/3
DEPTH TO INVERT	1.48	-0.06	-0.06	-0.17	-0.17	-0.31	-0.31	1.60
INVERT LEVEL	58.46	57.39	57.39	57.60	57.60	60.10	60.10	60.26
DESIGN SURFACE LEVEL	59.94	57.69			57.8		60.3	61.86
DISTANCE	18.33	0			0		7.82	16.66

Segment distances: Line E 18.33; Line G 7.82, 8.84

STORMWATER LINE E

STORMWATER LINE G

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Outlet Detail
Lines E & G

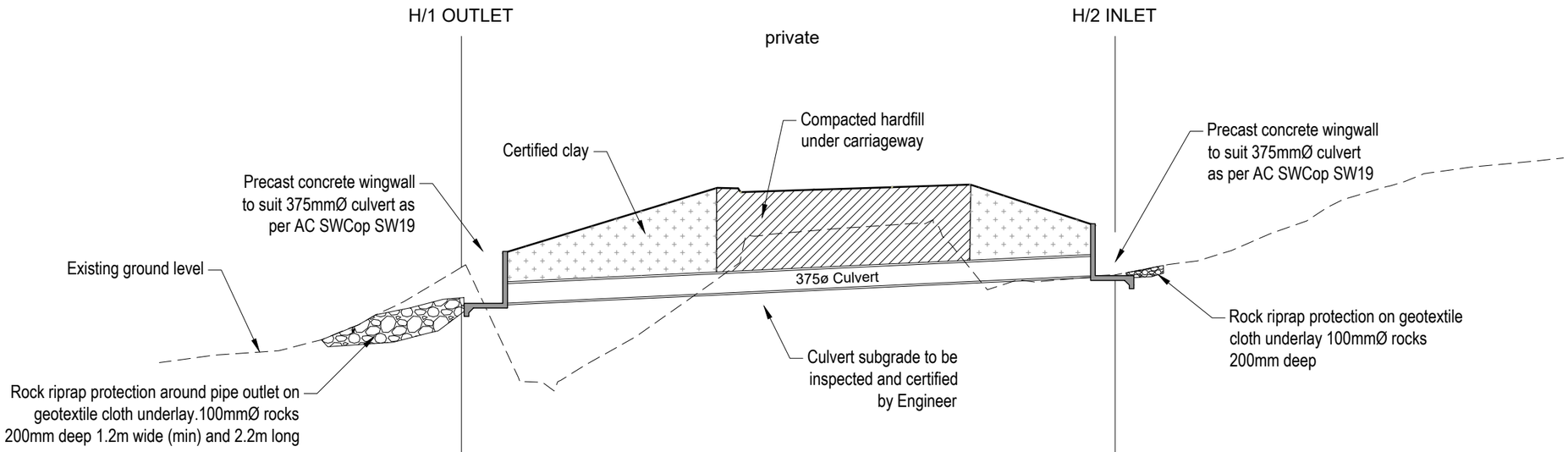
No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Engineering approval	AC	14/11/19
B	G/1 outlet edited	AC	19/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	AC	04/11/19
DRAWN	AC	04/11/19

DATE: 19/06/2020 | ORIGINAL SCALE: H 1:100 V 1:100 | ORIGINAL SIZE: A3

DRAWING NO.: 41351-DR-C-5703 | REVISION: B



GRADE %	4.58%	
DESIGN FLOW	32l/s	
PIPE SIZE (mm)	375	
PIPE TYPE	CLASS 4 RCRRJ	
BEDDING	AC-SW-03 H2 BEDDING	
DATUM R.L. 16.0m		
DEPTH TO INVERT	0.73	0.83
INVERT LEVEL	25.73	26.30
DESIGN SURFACE LEVEL	26.1	27.13
DISTANCE	0	12.6

STORMWATER LINE H

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater Outlet Detail
Line H (Private)

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for Engineering approval	AC	14/11/19
B	Line H labeled as private	AC	19/06/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	AC	04/11/19
DRAWN	AC	04/11/19

DATE	ORIGINAL SCALE	ORIGINAL SIZE
14/11/19	H 1:100 V 1:100	A3

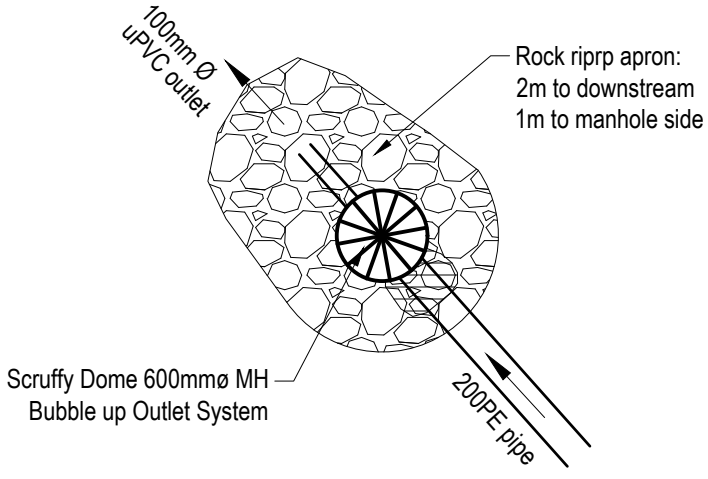
DRAWING NO. 41351-DR-C-5704
REVISION B

Auckland Council

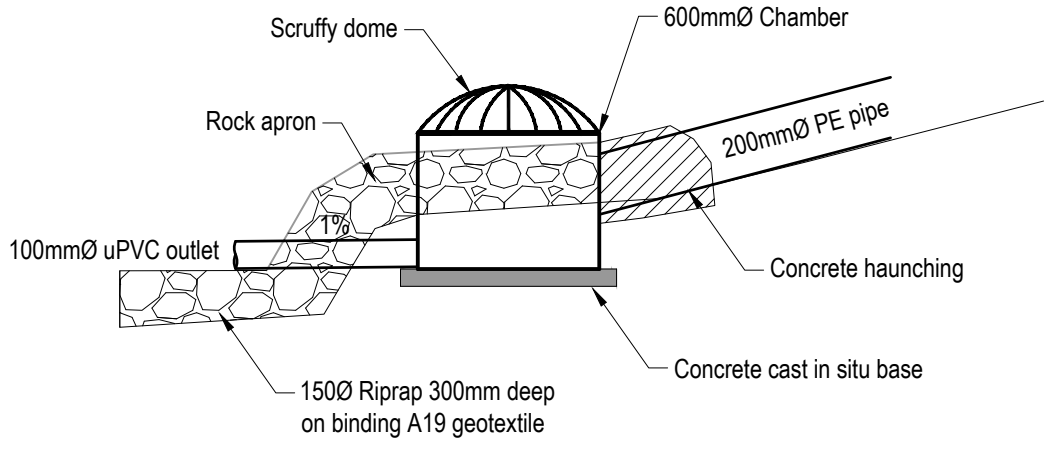
ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020



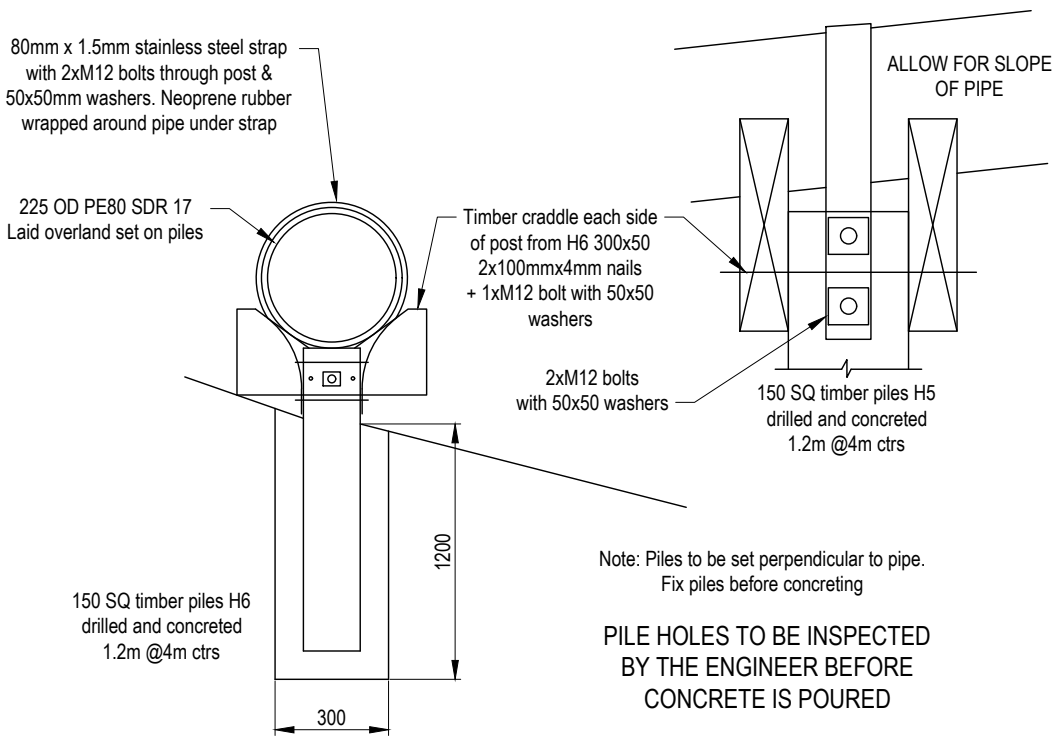
Plan View



Section View

Catchpit Bubble-Up Outlet Detail

Not to Scale



PILE SUPPORT FOR PE
PIPE LAID OVERLAND

Not to Scale

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Issued for EPA	AC	22/11/18
B	Subdivision layout changed	MF	09/07/19
C	Catchpit outlets changed to bubble ups	AC	22/06/2020

SURVEYED			
DESIGNED		AC	13/11/18
DRAWN		AC	13/11/18
DATE 22/06/2020	ORIGINAL SCALE As shown	ORIGINAL SIZE A3	
DRAWING NO. 41351-DR-C-5800		REVISION C	

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Stormwater
Pipe Support & Dispersal T-Bar
Details

WATER RETICULATION

1. All watermains or ridermains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for water reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All principal mains - PE100 SDR13.6
4. All ridermains 63OD - PE80B SDR 11
5. Bedding Details as per Standard Detail WS2
6. Fittings
   - All joints, bends, tees, crosses, tapers, risers, connection, blank caps and other fittings shall be manufactured, designed and constructed to withstand PN16 working pressure.
   - Denso tape must be applied to all stainless steel items associated with new water reticulation, including bolts and nuts associated with flanged connections and backing ring associated with a PE flange adaptor.
   - The Contractor must liaise with the Engineer, Council's Engineer and Watercare Services Ltd supervisors regarding inspection of the reticulation prior to backfilling.
7. Metallic Detector Tape shall be provided 200-400mm above all watermains and ridermains.

Water Reticulation Legend

Existing		Proposed
125	Watermain (Ø)	125
WSL	Trunk Watermain	
H	Fire Hydrant	H
△	Peet Valve	▲
⧖	Sluice Valve	⧗
⊣	Blank Cap	⊣
W	House Connection	W
M	Water Meter	M

Watercare
An Auckland Council Organisation
Network Extension Peer Review
Application Number: EPA-6712
Approved By: Amir Karimi
Date: 30/07/2020
This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

1
DP 455035

Existing 810Ø & 700Ø trunk watermains

Schnapper Rock Road

Kyle Road

Albertine Place

Drive 1

Drive 1A

Drive 2

Drive 3

Drive 4

Drive 5

Road 2

Road 2A

300

301

302

303

200

201 Pedestrian Accessway

40mmø PE (Private)

125ø main & hydrant (Private)

Existing 810Ø trunk watermain

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Subdivision layout changed	AC	09/08/19
C	Issued for EPA	AC	14/11/19
D	EPA Design Revisions	AC	07/04/2020
E	EPA edits 125 alignment Kyle Rd & Drive 5	AC	03/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/07/2020	1:1500	A3

DRAWING NO. 41351-DR-C-6000
REVISION E

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Water Reticulation
Overall Layout

Auckland Council

ENG60330592 GREG HALL

Approved Engineering Plan

02/09/2020

N

Watercare
An Auckland Council Organisation

Network Extension Peer Review

Application Number: EPA-6712

Approved By: Amir Karimi

Date: 30/07/2020

This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

Schnapper Rock Road

Kyle Road

Drive 1

Drive 1A

Drive 2

SV 7

SV 8

SV 9

SV 10

SV 11

FH 4

FH 5

Extg SV on 180 PE
(GIS ID 1625682)

Manifold meter bank
6 x lot connections
(lots 2 - 7)
Watercare SD WS22

6 x 25mm individual lot
connections (Private)

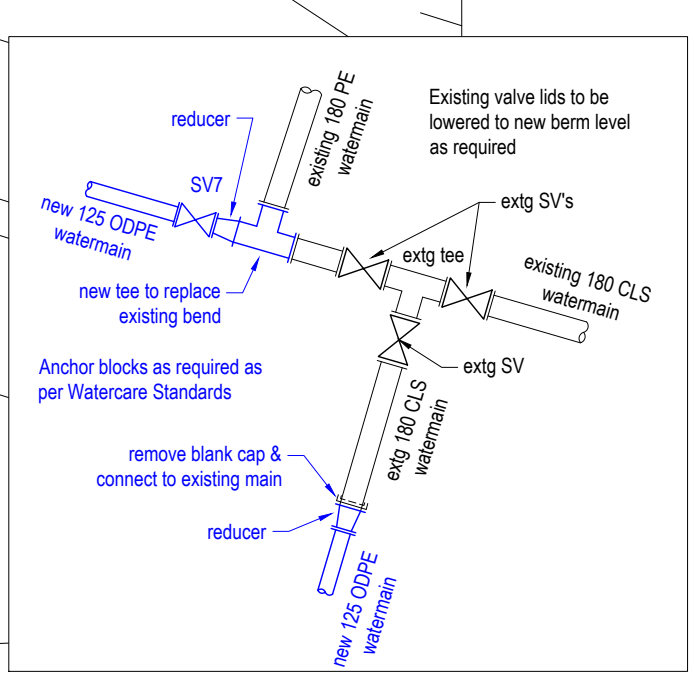
Manifold meter bank
3 x lot connections
(lots 18 - 21)
Watercare SD WS22

3x 25mm individual lot
connections (Private)

25mm individual lot
connections (Private)

201
Pedestrian
Accessway

1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 18 19 20 21 29 30 301



WATER RETICULATION

1. All watermains or ridermains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for water reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All principal mains - PE100 SDR13.6
4. All ridermains 63OD - PE80B SDR 11
5. Bedding Details as per Standard Detail WS2
6. Fittings
   - All joints, bends, tees, crosses, tapers, risers, connection, blank caps and other fittings shall be manufactured, designed and constructed to withstand PN16 working pressure.
   - Denso tape must be applied to all stainless steel items associated with new water reticulation, including bolts and nuts associated with flanged connections and backing ring associated with a PE flange adaptor.
   - The Contractor must liaise with the Engineer, Council's Engineer and Watercare Services Ltd supervisors regarding inspection of the reticulation prior to backfilling.
7. Metallic Detector Tape shall be provided 200-400mm above all watermains and ridermains.

Water Reticulation Legend

Existing		Proposed
125	Watermain (Ø)	125
WSL	Trunk Watermain	
H	Fire Hydrant	H
△	Peet Valve	▲
⧖	Sluice Valve	⧖
⊣	Blank Cap	⊣
W	House Connection	W
M	Water Meter	M

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Preliminary isued for tender	AC	21/12/18
B	Subdivision layout changed	AC	09/08/19
C	EPA Design Revisions	AC	07/04/2020
D	EPA edits	AC	03/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/07/2020	1:1000	A3

DRAWING NO. 41351-DR-C-6001

REVISION D

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Water Reticulation
Sheet 1

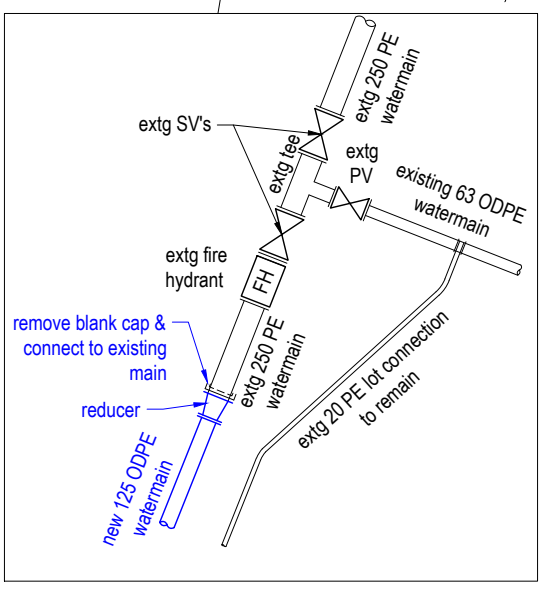
WATER RETICULATION

1. All watermains or ridermains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for water reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All principal mains - PE100 SDR13.6
4. All ridermains 63OD - PE80B SDR 11
5. Bedding Details as per Standard Detail WS2
6. Fittings
   - All joints, bends, tees, crosses, tapers, risers, connection, blank caps and other fittings shall be manufactured, designed and constructed to withstand PN16 working pressure.
   - Denso tape must be applied to all stainless steel items associated with new water reticulation, including bolts and nuts associated with flanged connections and backing ring associated with a PE flange adaptor.
   - The Contractor must liaise with the Engineer, Council's Engineer and Watercare Services Ltd supervisors regarding inspection of the reticulation prior to backfilling.
7. Metallic Detector Tape shall be provided 200-400mm above all watermains and ridermains.

Watercare
An Auckland Council Organisation
Network Extension Peer Review
Application Number: EPA-6712
Approved By: Amir Karimi
Date: 30/07/2020
This is only a review for water and/or wastewater network extension. EPA must be secured from Auckland Council.

Auckland Council
ENG60330592 GREG HALL
Approved Engineering Plan
02/09/2020

blank cap
3x 25mm individual lot – connections (Private)
25mm individual lot connections (Private)
40mmø PE (Private)
25mm individual lot connections (Private)
reducer
FH 3
125ø main & hydrant (Private)
Combined fire suppression supply and water meter (lots 26-35) Watercare SD WS25
PV 3
SV 5
SV 6
PV 2
FH 2
3x 40mm individual lot connections (Private)
Drive 3
FH 1
Manifold meter bank 3x lot connections (lots 40 - 42) Watercare SD WS22
SV 3
SV 1
SV 2
PV 1
SV 4
Drive 4
Road 2
Kyle Road
Albertine Place
Diagram B Sheet 6003
Diagram A Sheet 6003
N
29
19
32
28
33
201 Pedestrian Accessway
21
34
303
26
36
200
44
38
37
25
24
40
39
23
41
22
42
302



Water Reticulation Legend

Existing		Proposed
125	Watermain (Ø)	125
WSL	Trunk Watermain	
H	Fire Hydrant	H
△	Peet Valve	▲
⧖	Sluice Valve	⧖
⚑	Blank Cap	⚑
W	House Connection	W
M	Water Meter	M

FOR ENGINEERING APROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	Preliminary isued for tender	AC	21/12/18
B	Subdivision layout changed	AC	09/08/19
C	EPA Design Revisions	AC	07/04/2020
D	EPA edits 125 alignment Kyle Rd & Drive 5	AC	03/07/2020
SURVEYED			
DESIGNED		AC	10/08/14
DRAWN		TM	10/08/18

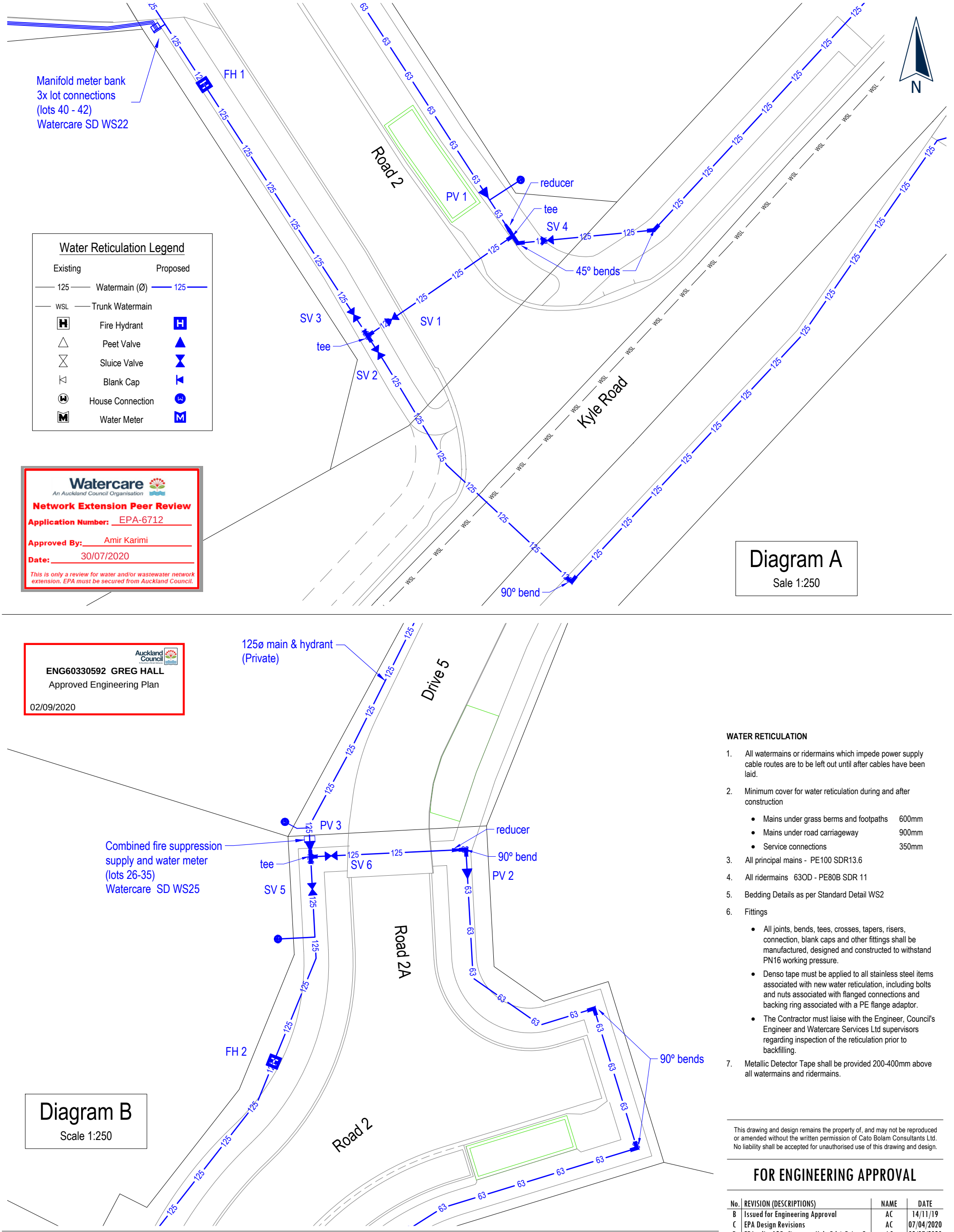
DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/07/2020	1:1000	A3

DRAWING NO.	REVISION
41351-DR-C-6002	D

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Water Reticulation
Sheet 2



WATER RETICULATION

1. All watermains or ridermains which impede power supply cable routes are to be left out until after cables have been laid.
2. Minimum cover for water reticulation during and after construction
   - Mains under grass berms and footpaths 600mm
   - Mains under road carriageway 900mm
   - Service connections 350mm
3. All principal mains - PE100 SDR13.6
4. All ridermains 63OD - PE80B SDR 11
5. Bedding Details as per Standard Detail WS2
6. Fittings
   - All joints, bends, tees, crosses, tapers, risers, connection, blank caps and other fittings shall be manufactured, designed and constructed to withstand PN16 working pressure.
   - Denso tape must be applied to all stainless steel items associated with new water reticulation, including bolts and nuts associated with flanged connections and backing ring associated with a PE flange adaptor.
   - The Contractor must liaise with the Engineer, Council's Engineer and Watercare Services Ltd supervisors regarding inspection of the reticulation prior to backfilling.
7. Metallic Detector Tape shall be provided 200-400mm above all watermains and ridermains.

FOR ENGINEERING APPROVAL

No.	REVISION (DESCRIPTIONS)	NAME	DATE
B	Issued for Engineering Approval	AC	14/11/19
C	EPA Design Revisions	AC	07/04/2020
D	EPA edits 125 alignment Kyle Rd & Drive 5	AC	03/07/2020

SURVEYED			
DESIGNED		AC	09/18/19
DRAWN		AC	14/11/19
DATE 03/07/2020	ORIGINAL SCALE As Shown	ORIGINAL SIZE A3	
DRAWING NO. 41351-DR-C-6003		REVISION D	

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Water Reticulation
Sheet 3

GENERAL CONSTRUCTION NOTES

STANDARDS RELATING TO WORKS

Works shall to be carried out to the requirements of the Health & Safety at work in Employment Act 2015

Works shall be completed to Watercare Construction Standards.

MANUFACTURERS SPECIFICATIONS

Materials shall be installed to the Manufacturers requirements unless otherwise specified.

WELDING & FIXINGS

All steelwork shall be be workshop fabricated.

Steelwork and fixings shall be hot-dip galvanised to AS/NZS 4680 unless otherwise stated.

A Nickel anti-seize free of copper , lead , sulphides , chlorides & carbons (graphite) shall be used on bolts.

REINFORCING STEEL

Reinforcing shall be centrally placed with the specified minimum cover.

Bends shall be cold formed.

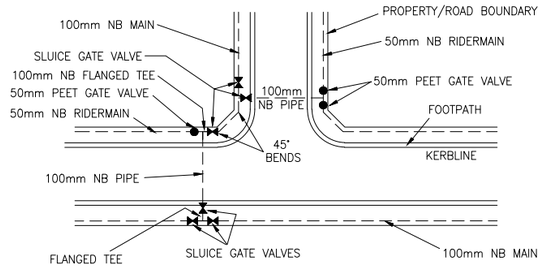
JOINT SEALS

Couplings & Flanges : Per WSL Material Standard.

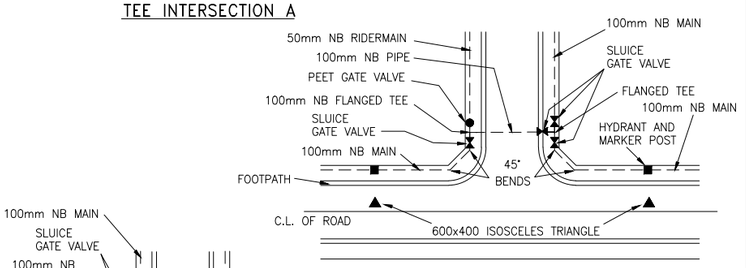
Concrete joints around pipe penetrations through chambers shall be made with a suitable hydrophilic sealant to the manufacturer's requirements. Concrete repair shall be reinforced and box-cast to prevent cracking from sealant forces.

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010069.002D .DWG

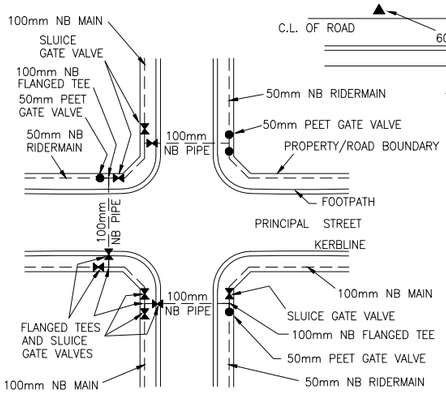
GENERAL CONSTRUCTION NOTES		
	SCALE:	N.T.S.
	ISSUE DATE:	13-07-2018
	DWG No.	2010069.002D
	REFERENCE No.	WS 1



TEE INTERSECTION A



TEE INTERSECTION B



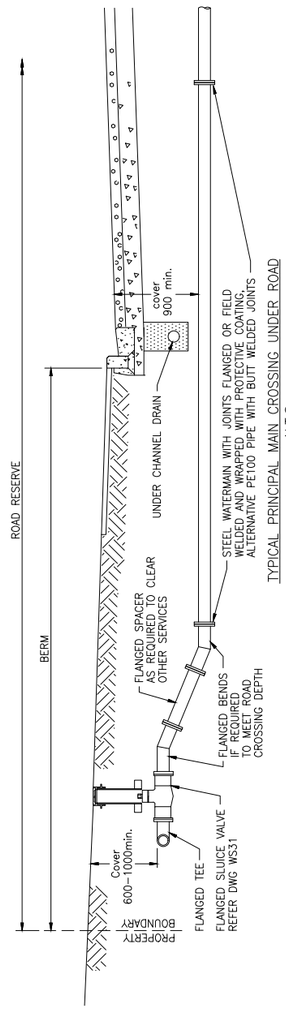
CROSS INTERSECTION

NOTES

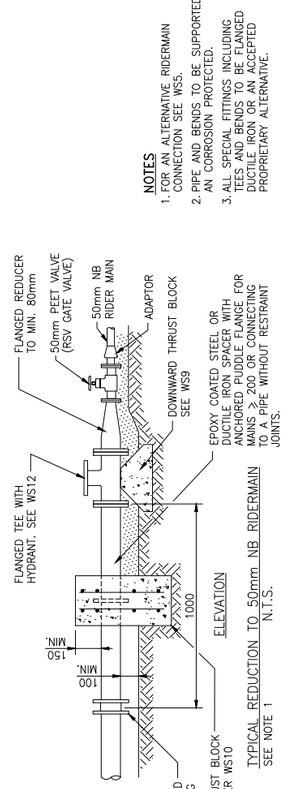
1. PIPES SHALL BE LAID PARALLEL WITH THE BOUNDARY.
2. ALL PRINCIPAL MAIN ROAD CROSSINGS SHALL BE 100mm DIA. (OR LARGER) DI, STEEL OR PE100, PIPES EXTENDING FROM MAIN TO MAIN.
3. BENDS SHALL BE LONG RADIUS BENDS.
4. ALL JOINTS UNDER ROADS SHALL BE FIELD WELDED OR FLANGED JOINTS (WRAPPED IN APPROVED WRAPPING SYSTEM
5. THESE DETAILS APPLY TO 100mm NB AND 150mm NB PRINCIPAL MAINS. LARGER DIAMETER MAINS SHALL GENERALLY PASS STRAIGHT THROUGH INTERSECTIONS.
6. REFER TO WS4 FOR CROSSING DETAILS.

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010069.003B .DWG

TYPICAL WATERMAIN INTERSECTION LAYOUT		
	SCALE:	N.T.S.
	ISSUE DATE:	13-03-2017
	DWG No.	2010069.003B
	REFERENCE No.	WS 3



TYPICAL PRINCIPAL MAIN CROSSING UNDER ROAD
N.T.S.



ELEVATION

TYPICAL REDUCTION TO 50mm NB RIDERMAIN
N.T.S.
SEE NOTE 1

NOTES

1. FOR AN ALTERNATIVE RIDERMAIN CONNECTION SEE WS5.
2. PIPE AND BENDS TO BE SUPPORTED AN CORROSION PROTECTED.
3. ALL SPECIAL FITTINGS INCLUDING TEES AND BENDS TO BE FLANGED DUCTILE IRON OR AN ACCEPTED PROPRIETARY ALTERNATIVE.

ROAD CROSSING DETAILS AND PRINCIPAL MAIN TO RIDER MAIN CONNECTIONS

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010069.004C .DWG

SCALE:	N.T.S.	
ISSUE DATE:	13-07-2018	
DWG No.	2010069.004C	
REFERENCE No.	WS 4	

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

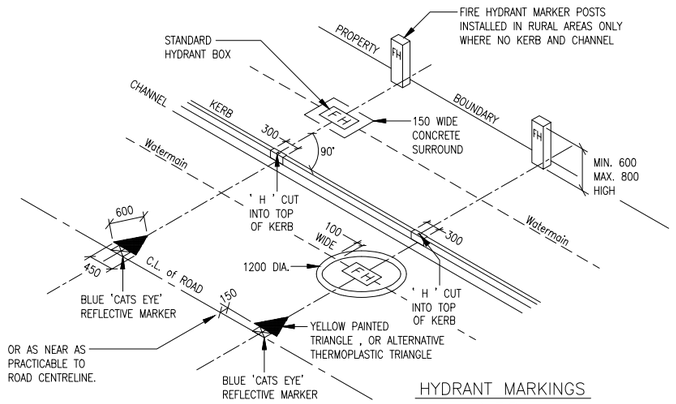
HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Water
Standard Details
Sheet 1 of 4

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Tender	AC	21/12/18
B	Subdivision layout changed	AC	09/07/19

FOR ENGINEERING APPROVAL

		NAME	DATE
SURVEYED			
DESIGNED		AC	21/12/18
DRAWN		PJT	05/11/18
DATE	ORIGINAL SCALE	ORIGINAL SIZE	
05/11/2018	NTS	A3	
DRAWING NO.		REVISION	
41351-DR-C-6200		B	



HYDRANT MARKINGS

N.T.S.

NOTE: ALIGN LONGITUDINAL AXIS OF HYDRANT BOX WITH WATERMAIN

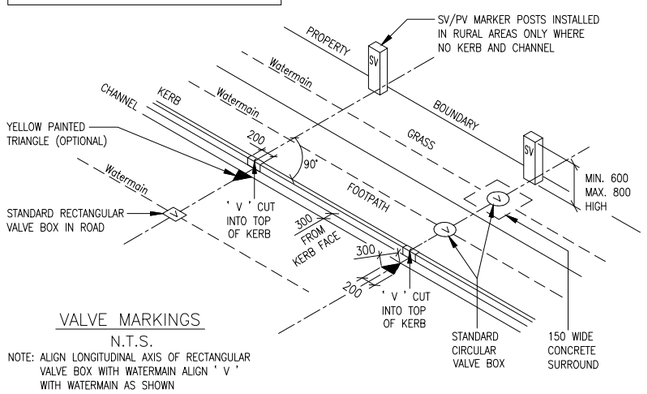
NOTES

PAINT USED FOR ALL MARKINGS AND CI/DI LIDS SHALL BE TRANSIT "ROAD MARKING PAINT" AS FOLLOWS:-

HYDRANTS - YELLOW
PROTECTIVE PAINTS LTD.- IJAY CODE: 880-403
OR - RESENE M7-W ;
(ALTERNATIVE OPTION THERMOPLASTIC TRIANGLE)

VALVES (PV, SV, AV"s) - WHITE

SPECIAL CONTROL VALVES (SHUT) - RED
RESENE RED OXIDE - VINYL ETCH
ADHESION PRIMER



VALVE MARKINGS

N.T.S.

NOTE: ALIGN LONGITUDINAL AXIS OF RECTANGULAR VALVE BOX WITH WATERMAIN ALIGN ' V ' WITH WATERMAIN AS SHOWN

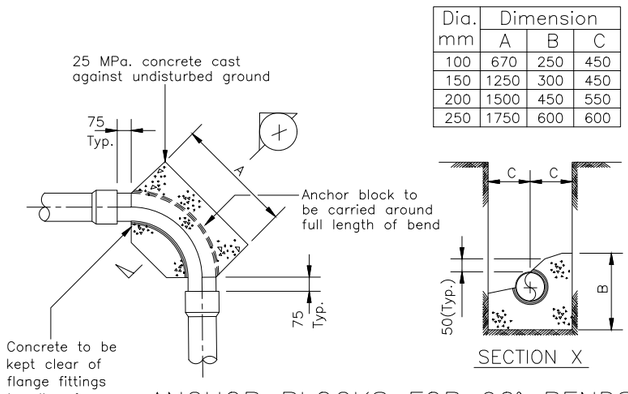
Watercare

VALVE AND HYDRANT MARKINGS

SCALE:	N.T.S.
ISSUE DATE:	10-02-2017
DWG No.	2010069.006B
REFERENCE No.	WS 7

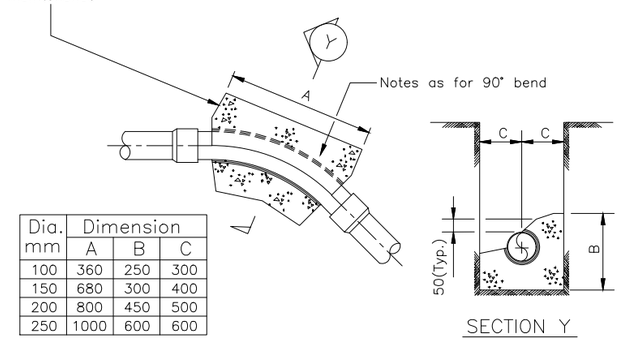
Notes :

1. Thrust block dimensions are based on firm soil conditions.
2. The dimensions to be increased or decreased for variation in soil conditions.
3. Allowable bearing stress used - 100KPa.
4. As built locations to be obtained prior to backfill.
5. Protective membrane (Polythene) between concrete & pipe.
6. 75mm clearance between fittings/flanges and concrete casting.
7. All fittings to be wrapped with a suitable wrapping system.



Dia. mm	Dimension A	B	C
100	670	250	450
150	1250	300	450
200	1500	450	550
250	1750	600	600

ANCHOR BLOCKS FOR 90° BENDS



Dia. mm	Dimension A	B	C
100	360	250	300
150	680	300	400
200	800	450	500
250	1000	600	600

ANCHOR BLOCKS FOR 45° BENDS

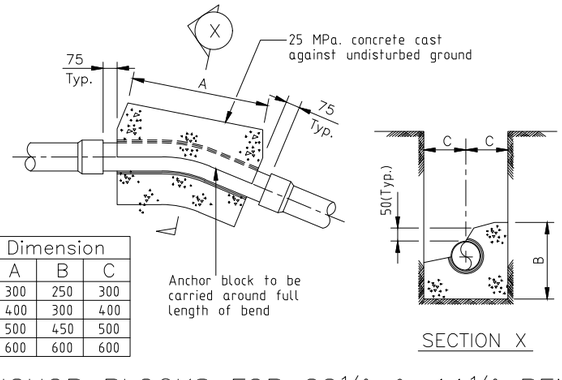
Watercare

ANCHOR BLOCK DETAILS FOR 90° & 45° BENDS

SCALE:	N.T.S.
ISSUE DATE:	10-02-2017
DWG No.	2010069.013B
REFERENCE No.	WS 8

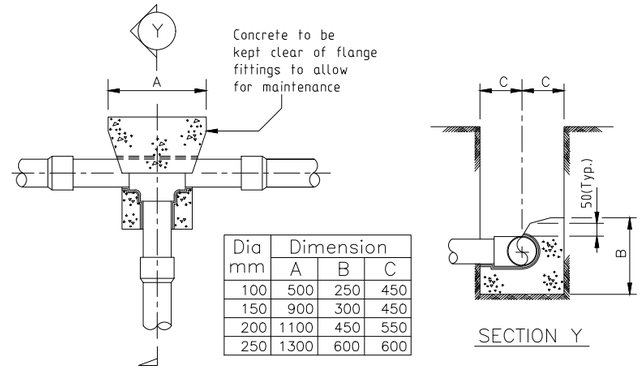
Notes :

1. Thrust block dimensions are based on firm soil conditions.
2. The dimensions to be increased or decreased for variation in soil conditions.
3. Allowable bearing stress used - 100KPa.
4. As built locations to be obtained prior to backfill.
5. Protective membrane (Polythene) between concrete & pipe.
6. 75mm clearance between fittings/flanges and concrete casting.
7. All fittings to be wrapped with a suitable wrapping system.



Dia mm	Dimension A	B	C
100	300	250	300
150	400	300	400
200	500	450	500
250	600	600	600

ANCHOR BLOCKS FOR 22½° & 11¼° BENDS



Dia mm	Dimension A	B	C
100	500	250	450
150	900	300	450
200	1100	450	550
250	1300	600	600

ANCHOR BLOCKS TEE JUNCTION & END CAPS

Watercare

ANCHOR BLOCK DETAILS FOR 22½° & 11¼° BENDS AND TEE JUNCTION

SCALE:	N.T.S.
ISSUE DATE:	10-02-2017
DWG No.	2010069.014B
REFERENCE No.	WS 9

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Water Standard Details
Sheet 2 of 4

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Tender	AC	21/12/18
B	Subdivision layout changed	AC	09/07/19

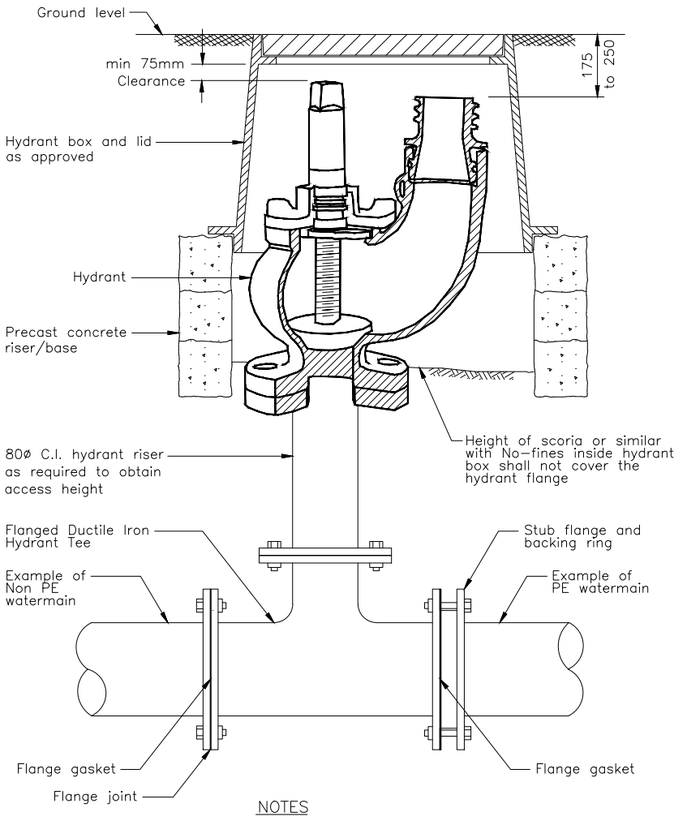
FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	AC	21/12/18
DRAWN	PJT	05/11/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
05/11/2018	NTS	A3

DRAWING NO. 41351-DR-C-6201

REVISION B



NOTES

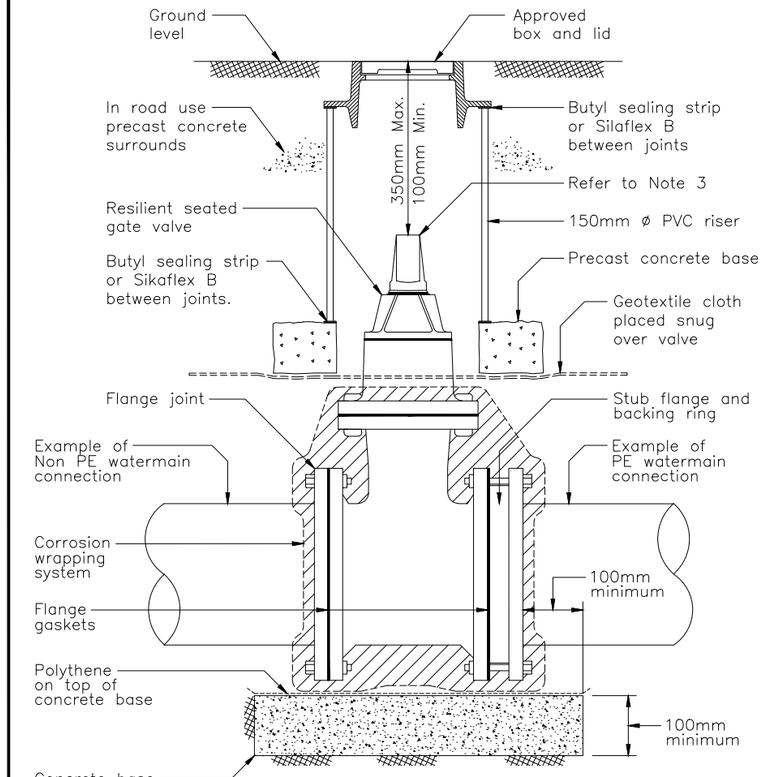
1. The hydrant box shall be spaced to provide clear access to the valve spindle and outlet.
2. All flanges and fittings shall be wrapped with suitable corrosion protection wrapping to the manufacturers requirements. Refer WS11
3. Concrete support to be provided under hydrant Tee. Refer WS9. (The concrete overbear can be ignored)

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 20100069.027A .DWG

Watercare

HYDRANT DETAIL

SCALE:	N.T.S.
ISSUE DATE:	06-03-2017
DWG No.	2010069.027A
REFERENCE No.	WS 12



NOTES

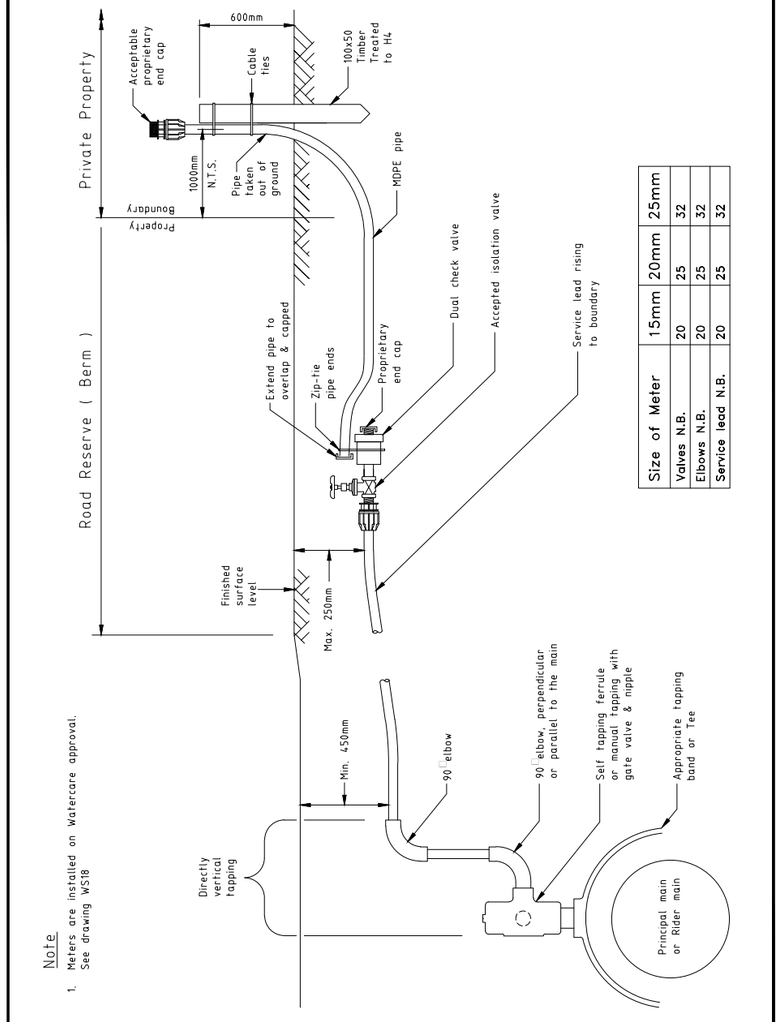
1. The valve, including flanges shall be completely wrapped in approved corrosion protected wrapping system to the wrapping manufacturers requirements.
2. Refer WS11 for typical notes on flange bolting .
3. An extension spindle shall be incorperated as required to ensure the top of the spindle is no more than 350mm below the finished surface level.
4. For valves 150mm and greater the valve shall be supported on a in-situ cast concrete base of suitable dimension to prevent any loads transfered to the pipe.

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010069.029B .DWG

Watercare

FLANGED SLUICE VALVE DETAIL

SCALE:	N.T.S.
ISSUE DATE:	26-05-2017
DWG No.	2010069.029B
REFERENCE No.	WS 13



Size of Meter	15mm	20mm	25mm
Valves N.B.	20	25	32
Elbows N.B.	20	25	32
Service lead N.B.	20	25	32

Note

1. Meters are installed on Watercare approval. See drawing WS18

0:\---\ EGCADFI \ 2017 \ WATER & WASTEWATER NETWORK STD DWGS \ 2010069.046 .DWG

Watercare

PROPERTY (LOT) SERVICE LEAD CONNECTION IN BERM/SOFT SURFACES

SCALE:	N.T.S.
ISSUE DATE:	13-07-2018
DWG No.	2010069.046
REFERENCE No.	WS 17

Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd & Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Water Standard Details
Sheet 3 of 4

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Tender	AC	21/12/18
B	Subdivision layout changed	AC	09/07/19

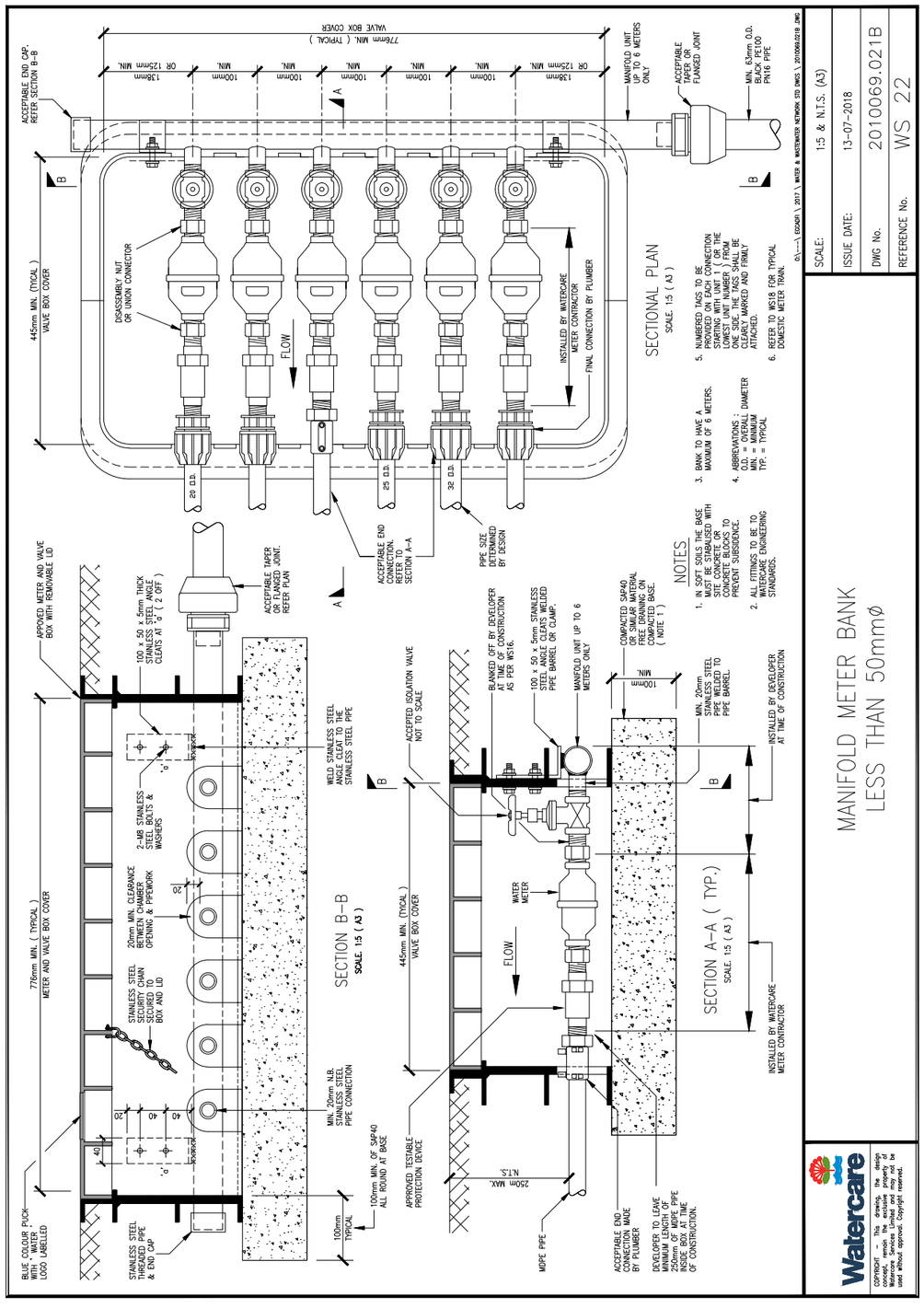
FOR ENGINEERING APPROVAL

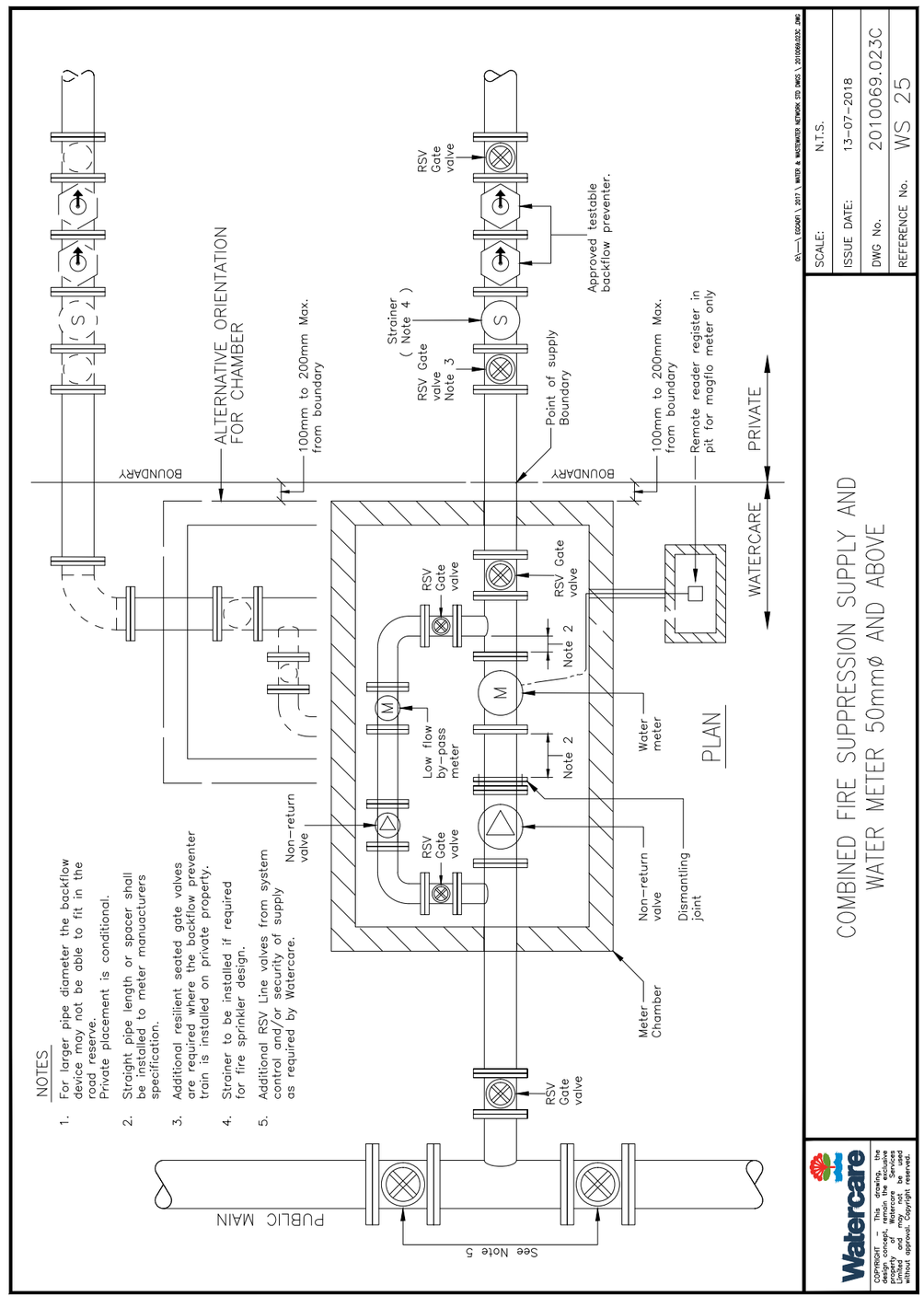
	NAME	DATE
SURVEYED		
DESIGNED	AC	21/12/18
DRAWN	PJT	05/11/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
05/11/2018	NTS	A3

DRAWING NO. 41351-DR-C-6202

REVISION B





Cato Bolam
creating great places
PLANNERS | SURVEYORS | ENGINEERS
ARCHITECTS | ENVIRONMENTAL

HL Developments Albany Ltd &
Golden Horse Land Development Ltd
55 Schnapper Rock Rd & 52 Kyle Rd
Albany

Watercare Water
Standard Details
Sheet 4 of 4

No.	REVISION (DESCRIPTIONS)	NAME	DATE
A	For Tender	AC	21/12/18
B	Subdivision layout changed	AC	09/07/19
C	WS 25 added	AC	03/07/2020

FOR ENGINEERING APPROVAL

	NAME	DATE
SURVEYED		
DESIGNED	AC	21/12/18
DRAWN	PJT	05/11/18

DATE	ORIGINAL SCALE	ORIGINAL SIZE
03/07/2020	NTS	A3

DRAWING NO. 41351-DR-C-6203
REVISION B

Watercare
An Auckland Council Organisation

Watercare Services Limited
Private Bag 94010
Auckland 2241
www.watercare.co.nz
Customer service line
Mon to Fri 7.30 to 6pm
09 442 2222
info@water.co.nz

Fault line
24 hours
09 442 2222
Free text 3130
faults@water.co.nz

30 July 2020

Greg Hall
Council Development Engineer
Auckland Council
Private Bag 92300
Victoria Street West, Auckland

Dear Greg,

Council App number ENG60330592 –EPA
55 Schnapper Rock RD Schnapper Rock 0632
Watercare application number – EPA-6712

Section 1 - Purpose

Watercare has reviewed the application, including details of proposed water and wastewater infrastructure to vest in Auckland Council (and then in Watercare) on completion, for compliance with the Auckland Water Supply and Wastewater Network Bylaw 2015 (**Bylaw**).

Watercare confirms that, subject to the conditions below, the application complies with the Bylaw and Watercare's Water and Wastewater Code of Practice for Land Development and Subdivision (**Code of Practice**). On that basis, it recommends that Auckland Council grant engineering plan approval, subject to the conditions below.

Section 2 – General conditions

1. A bulk point installation shall be used with individual private boundary kits located inside the property. All the pipes and boundary kits after bulk point remains private. A body corporate (or similar legal instrument) arrangement required.
2. Watercare's recommendation in this letter is based on the application for Engineering Plan Approval number ENG60330592 as of today's date, in particular

Drawing No.	41351-DR-C-4000	41351-DR-C-4001	41351-DR-C-4002	41351-DR-C-4003	41351-DR-C-4004	41351-DR-C-4100	41351-DR-C-4101	41351-DR-C-6000	41351-DR-C-6001	41351-DR-C-6002	41351-DR-C-6003
Rev	G	F	E	E	D	C	C	E	D	D	D

Any amendment to the proposals set out in those documents will require further review by Watercare, and is not covered by this letter.

3. This recommendation is valid for two years from the date of this letter.

4. The construction of water and wastewater infrastructure to vest in Auckland Council (and then in Watercare) on completion (**public water supply and wastewater works**) must comply with the requirements of the current Code of Practice, as well as Watercare's standards for material supply, construction and asset data capture.

5. The public water supply and wastewater works must comply with Watercare's requirements in accordance with Watercare's Compliance Statement Policy, Part 1 for Land Development and Subdivision Works.

6. All connections/disconnections to Watercare water/wastewater networks must be made in accordance with Watercare's connection processes, and must comply with the current Code of Practice.

7. Under the Bylaw Watercare may refuse to accept the vesting of any infrastructure not completed in accordance with general conditions 2 to 5 above.

Section 3 – Local conditions

1. The public water supply and wastewater works detailed on the accompanying reviewed Cato Bolam drawings

Drawing No.	4135 1-DR-C-4000	4135 1-DR-C-4001	4135 1-DR-C-4002	4135 1-DR-C-4003	4135 1-DR-C-4004	4135 1-DR-C-4100	4135 1-DR-C-4101	4135 1-DR-C-6000	4135 1-DR-C-6001	4135 1-DR-C-6002	4135 1-DR-C-6003
Rev	G	F	E	E	D	C	C	E	D	D	D

as amended shall be constructed at no cost to Watercare.

2. The submitted proposed plans must be based on actual site verification of the existing public wastewater drains and watermains.

3. All works on existing public wastewater drains and watermains (including connections and disconnections) shall be carried out only by a Watercare approved contractor at the applicant's expense.

4. All works in close proximity to existing public wastewater drains and watermains will require a "works over" approval from Watercare.

5. Watercare approval is required before any individual building / lot is connected to the public water and/or wastewater network. An application for new connection shall be submitted to Watercare in conjunction with the application to Council for building consent.

6. Watercare infrastructure growth charges will apply to this development. Details of the charge are available on the website, watercare.co.nz.

Wastewater drainage

- Adequate provision shall be made for the disposal of wastewater from each building site / unit tenancy / allotment.

- A minimum 1.2 metres is required from the soffit level of the public wastewater drain to the lowest floor level.

- All wastewater stubs for service connections must be constructed with new public wastewater reticulation main extensions and provided with end cap and marker post within each lot boundary. Watercare approval is required before any service connection is made on the wastewater stub.

Water supply

- An adequate water supply reticulation system must be installed to provide a suitably located water service to each allotment / building.

- Adequate provision must be made for the protection of public watermain from any proposed network utility service. This will include locating all watermain, hydrants, valves and tees before work begins.

- All water supply leads for service connections must be constructed with the new public water supply reticulation main extensions as per Watercare standard drawing number WS13 or WS14 as appropriate. The meter installation must be carried out by a Watercare approved contractor.

- Mixed-used development shall have two (2) separate bulk water meters, one (1) to service the residential units and one (1) to service the commercial units.

- The granting of this application does not constitute a guarantee from Watercare Services Limited to provide a fire fighting capability in accordance with Fire and Emergency New Zealand Code of Practice.

- Water pressure could change in the future. To comply with FW2 fire risk classification, the installation of a sprinkler system and/or booster pump may be required for commercial, industrial high-rise and mixed-use buildings.

Next step

To proceed with construction the contractor nominated by the designer will be required to request a pre-construction meeting with Watercare. Please email preinspection@water.co.nz together with a copy of the completed construction environment management plan (CEMP) and the latest evaluation of the Construction Monitoring level. Contractor must ensure that these documents are concurred and/or approved by the designer.

Yours faithfully,

Amir Karimi
Development Engineer, Developer Service
Watercare Services Limited

29 April 2021

Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

Dear Sir/Madam,

The following is our formal response to your S92 letter. This letter is intended to be read in conjunction with the updated Stormwater Management Plan (Rev B), and Infrastructure Report (Rev B).

Requested information:

Healthy Waters

HW1

It is understood that mana whenua consultation has been undertaken. It will be important to get an understanding of mana whenua's views on stormwater management proposed on the site.

Refer to revised Section 3.1 for summary of mana whenua consultation.

HW2

*Please incorporate Auckland Transport's feedback on stormwater treatment devices in the Stormwater Management Plan (**SMP**).*

The AEE states:

Feedback from Auckland Transport states that AT isn't opposed to raingardens. However, numerous small raingardens can create issues for AT in terms of maintenance. The design of the SW treatment devices can be worked through with the applicant as they progress with their proposal.

This feedback needs to be incorporated into the SMP and the proposed stormwater management should reflect this.

Refer to updated section 6.2.2

Localised stormwater device such as specific designed rain garden or stormwater tree pits, is deemed to be the best practical option (BPO) in terms of providing treatment at-source for the future public roads. As much as practical, these stormwater treatment devices will be situated in concentrated areas by installing in long runs within the public road berm.

HW3

Please revise and clarify section 6.1.2 of the SMP which states that the SMP "complies with the guidelines set out in conditions 3-9 of the regional NDC".

*It is unclear what this refers to as conditions 3-9 of the regionwide network discharge consent (**NDC**) do not relate to development*.

Refer to revised Section 6.1.2.

Updated statement to refer to Schedule 4 (greenfield site) and relevant chapters of AUP-OP.

HW4

Please clarify what areas are proposed to have water quality treatment under this SMP and provide a more in-depth justification for the best practicable option.

There are inconsistencies within the SMP about which areas are proposed to have water quality treatment. Given the concept layout, it is not likely that any high contaminant generating roads or carparks will be part of the future development. It is also likely that there will be a combination of private and public roads. This should be accounted for when discussing the appropriate options for stormwater management.
The SMP needs to be clear about what it is proposing with regards to requirements for water quality treatment and to discuss the feasible options for achieving this.

Refer to HW2 response.

HW5

Please clarify if raingardens are proposed for driveways as well as roads, and whether they include private roads. Please also clarify how this will affect the possible options for water quality and hydrology mitigation for public roads.

The SMP uses GDO1 table 16 to decide that raingardens for trafficable surfaces (only) is the best option. It is unclear if that includes driveways or just roads, and if it includes public or private roads. During pre-lodgement, Auckland Transport have clearly expressed preference to not have small box raingardens vested to them due to ongoing maintenance costs. Clarity is sought on how this will affect the possible options for water quality (and hydrology mitigation) for public roads.

Refer to updated section 6.2.2

Due to the sites steep contours, it is anticipated that the future development will be restricted in space to allow for a large, centralised treatment device (wetland) to provide treatment for the entire catchment of the new public roads. In addition, a centralised treatment device becomes unfeasible to be constructed as it requires a moderately flat terrain.

Public Roads shall be treated through specific designed raingardens.

Commonly owned private driveways will be treated through either raingardens or stormwater filters (proprietary)

HW6

Please comment on how groundwater levels would affect the use of raingardens and underground infiltration tanks.

The Geotechnical Feasibility Report states 7 of the 8 boreholes show groundwater levels at shallow depths (0.2 to 0.8m). The SMP proposes raingardens and underground infiltration tanks for trafficable areas. There is no further discussion of underground infiltration tanks in the SMP and whether it is feasible on this site given the high groundwater levels.

Refer to updated section 6.2.3

Groundwater will be controlled through provisions of subsoil drainage to allow for the public and private road construction. Groundwater levels and infiltration rates shall be confirmed when detailed design and final location of the devices are finalised. An alternative option such as, permeable pavement for the common accessway can be utilised.

HW7

Please clarify if rainwater tanks will be plumbed for non-potable reuse for all houses.

Further information is requested on the nature of proposed reuse – whether it is for all non-potable uses (in which case non-potable plumbing is required in all houses), or for external uses (watering of lawn and plants, and car wash) only.

Refer to updated section 6.2.3

Rainwater tanks will be utilised for outdoor use only (watering lawns, plants and car washing).

HW8

Please explain where runoff from catchment 4 in Image 9 of the SMP will be discharged to.

It will be helpful to understand if this catchment will discharge to a network in the area or directly to the stream/gully via private discharge points.

Refer to updated 6.2.3 – Proposed Public Network

Areas for catchment 4 is now included within catchment 3. The combined catchment areas will discharge into the 300Ø future pipe located within the southern corner of the site via public network extension.

HW9

The 525mm pipe connection to the neighbouring lot is located roughly at the mid-point of the Watercare's site. Although this is only a concept layout, a public accessway or easement to this point should be shown.
Downstream 525mm pipe and the 300-375mm pipe may not have sufficient capacity to convey the 10-year ARI MPD CC flow if all sub-catchments are taken into consideration including the Watercare site and Catchment 4. Provide details as to maximum capacity available.

What is the alternative plan? Detention for flows more than downstream pipe capacity or construct new pipe through neighbouring lot to the stream?

Refer to the infrastructure report – section 1.4.3

The 525Ø pipe located within the midpoint of the Watercare Site will be vested as public as per ENG60330592. The stormwater network extension from the 525mmØ line will include a new stormwater line along the eastern boundary towards the development. An easement or accessway is not required as it will be vested as public. It is noted that neighbour's approval (Watercare Site) will be required prior to construction of the stormwater extension.

A capacity assessment has been undertaken on the future downstream network which can be found in **Appendix D**. The catchment has been delineated to not cause flooding of the stormwater network for the 10-year ARI.

HW10

The timing of construction of the downstream pipes is a possible risk and a dependency. If the development next door is stalled for any reason, discharge from this site will not be able to occur. While this is low risk, as construction has started, but it should be acknowledged. Or are the downstream works already completed?

A potential delay on the adjacent subdivision is considered a risk to the development as it has allowed provisions for infrastructure that provide connectivity for the site. Consultation with the adjacent development will be undertaken prior to lodgement of resource consent to identify key milestones for the project.

Refer to updated Section 6.8.

HW11

The SMP is not clear which devices are proposed to be public/which to be private. Although the exact layout will not be determined until the resource consent, the plan change needs to provide some indication.
AT are unlikely to accept precast raingardens or proprietary devices. Alternatives need to be explored.
Both devices are also a big burden on private owners – likelihood of maintenance not being undertaken is high.

- Public Roads shall be treated through specific designed raingarden or stormwater tree pits.
- Commonly owned private driveways will be treated through either raingardens or stormwater filters.

There are site constraints that makes a centralised stormwater device unfeasible to treat the public road. At source has been considered the BPO for providing quality treatment and stormwater mitigation.

Refer to the updated section 6.4 for clarity on asset ownership.

HW12

Please delete all references to TP10 as this has been superseded by GD01.

References to TP10 has been removed for consistency, as requested.

HW13

Please provide reasoning for mitigating 10-year peak flows to pre-development levels.

It is noted that there isn't any flooding issue downstream except for the flooding at Kyle Road which will be reduced by the neighbouring development with the construction of the 750mm by-pass culvert. Further information is sought to better understand the reasoning for proposing to mitigate 10-year peak flows to pre-development levels.

10-year peak flow mitigation has been removed in section 8.1 for the determined catchment 1 discharging into the western gully. The catchment contributes to Te Wharau Creek past the Kyle Road stormwater bypass.

HW14

Please complete the table on page 6 of the Healthy Waters review (Attachment 4 to the letter).
The table will assist with the SMP approval process under the NDC.

Refer to the table attached within this letter.

HW15

Please complete the table on page 6 of the Healthy Waters review (Attachment 4 to the letter).

Section 1.4.2 of the Infrastructure Report states that the Auckland Unitary Plan only requires water quality for high-use roads and high contaminant generating car parks. While this is correct, the Healthy Waters network discharge consent requires water quality treatment for all impervious surfaces. The SMP appears to be proposing water quality treatment for some of the roads. Further information is sought for clarity.

Advice note: Schedule 4 of the NDC requires water quality treatment for all impervious areas. A proposal for reduced water quality treatment is unlikely to be approved under the NDC and must be accompanied by thorough justification.

Refer to the infrastructure report – section 1.4.2

As part of the AUP(OP) requirements, development of a new or redevelopment of an existing high use road greater than 1000m^2 shall require treatment prior to discharging to the public stormwater reticulation system. The site is further subject to the treatment requirements of the new regionwide NDC which requires a higher

level of baseline treatment. Treatment will be provided for the new public roads and common private driveways at source prior to discharging into the receiving environment.

HW16

Please clarify if public reticulation is proposed for all impervious areas.

Section 1.4.3 of the Infrastructure Report proposes public reticulation for all impervious areas. However, section 1.4 of the report mentions that sites will have level spreaders. Further information is sought for clarity.

Refer to revised section 1.4.3.

Majority of the site will be serviced through a public reticulated network. Catchments 2 and 3 will be serviced through the new extended stormwater network. Catchment 1 will be provided with a new stormwater network to discharge into the western gully. This new network will discharge stormwater into the western gully. For residential lots which have direct access to the western gully, a private outlet structure can be utilised when a connection cannot be provided to the new stormwater network. For example, the lot on located on the western side of the stream.

Watercare

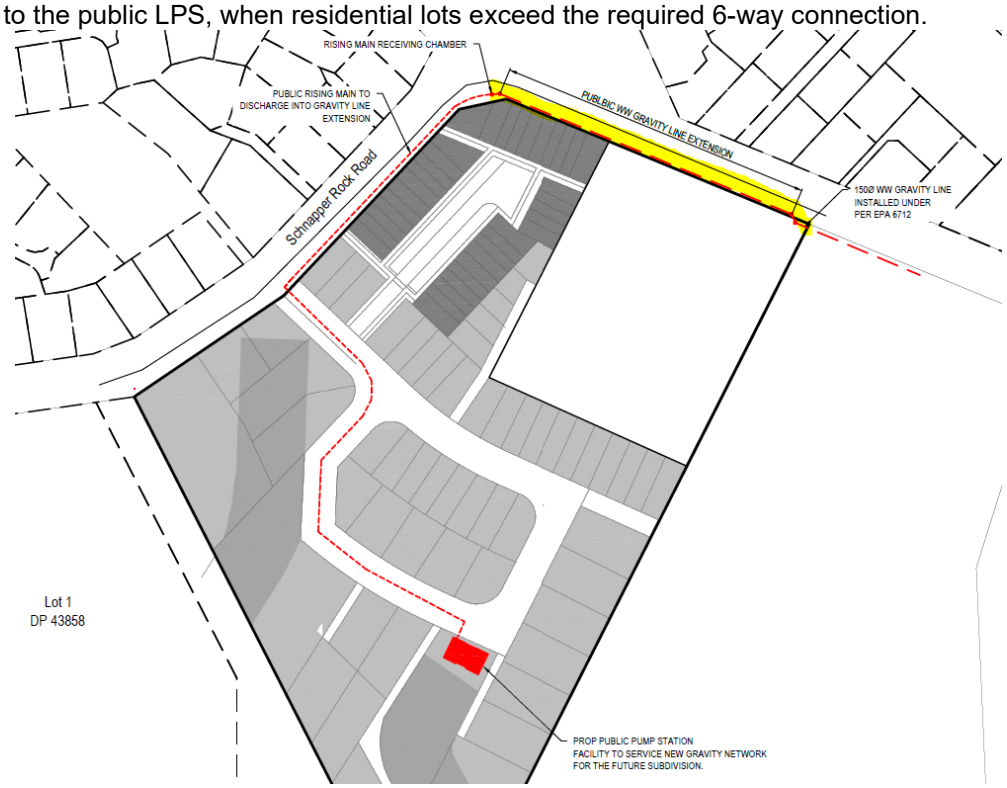
W1

Please provide more information on how Option 1 as identified in the Infrastructure Report would work.

Watercare does not favour low pressure sewer systems. It is acknowledged in the infrastructure report that Watercare does not allow public pressurised pipes on private property. It is unclear how this option would work. More information is required to assess this option.

To enable the LPS (option 1) and pump station (option 3), a gravity extension from the point of supply provided by the adjacent development is required, as highlighted in yellow below.

Any proposed public pressurised systems need to be located within a public road reserve. For the residential lots located within private ways (without public road frontage), a 6-way meter bank shall be provided or a bulk supply point to the public LPS, when residential lots exceed the required 6-way connection.



5.3.12.3.2 System layout

(h) Multiple private connections to dwellings on a single property, or where a subdivision does not provide a dwelling with direct public road frontage, shall be supplied through a bulk boundary kit arrangement or with a multi-kit box arrangement associated with the property. Private connections are made from the bulk point or multi-kit box.

(i) A multi-kit box shall not house more than six individual boundary kits. Where more than six individual boundary kits are required for dwellings not fronted by a public road, a bulk point installation shall be used with individual private boundary kits located inside the property.

W2

Please clarify what is meant by "it is noted that this option has been highly considered by Watercare and approval is required for any proposed pressure pipe sections located within Watercare Owned land" in section 1.3 of the Infrastructure Report.

It is unclear what this part of the report means. Please clarify.

Refer to revised Section 1.3

A third option is proposed via new pump station within the development. From preliminary consultation with Watercare, it is understood that an LPS (option 1) is not supported. Both option 2 and 3 are under review with the main preference being option 2 pending the capacity assessment.

Yours faithfully,

John Duran
ENGINEER

57 & 57a Schnapper Rock Road
Maven Associates Ltd – 175006

28 May 2021

Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

Dear Sir/Madam,

The following is our response to the Healthy Water's queries received on the 17th May 2021. This letter is intended to be read in conjunction with the updated Stormwater Management Plan (Rev C), and Infrastructure Report (Rev B).

Requested information:

Healthy Waters

HW4 - Water Quality

The revised SMP now clarifies that water quality mitigation will be provided for public roads and for "commonly owned accessways".

- *Please clarify further if this includes any private roads, or single house driveways and if not how water quality mitigation will be provided for these?* Common accessways are private roads utilised by more than more than one property (as highlighted in blue dashed line within the master plan) and subject to higher yielding contaminants. For single house driveways, these will be generally less than 30m² to be mostly used as parking spaces therefore treatment is not proposed due to the minimal contaminants produced. In is in our opinion that treatment device such as GPT is adequate to treat these areas.

- *Please also confirm that all devices will be designed in accordance with GD01. This is implied but not explicitly stated.* All devices will be designed in accordance with GD01, and proprietary devices approved by Auckland Council.

HW7 – Rainwater Harvesting

Rainwater harvesting for outdoor use does not provide sufficient water demand to meet the hydrology mitigation (SMAF/E10 & NDC) requirement for retention. Tanks must be plumbed for at least toilet flushing to be meet the provision of retention. Additionally, this provides a water quality benefit for the roof runoff as the first flush of runoff is diverted away from the receiving environment.

Please amend the SMP to either provide for internal non-potable reuse or to state explicitly that the proposed reuse will not function as the retention component of the mitigation required by E10. That component will then need to be provide for by another mechanism, the detail of which can be assessed as part of the resource consent application.

Refer to SMP 6.2.3 - Rainwater harvesting tanks to capture stormwater run-off for re-use for indoor and outdoor purposes such as watering lawn, plants and car washing. The re-use tanks shall be plumbed for at least one toilet or indoor washing.

HW14 –

The revised table was not attached. Please revise as needed to reflect any changes from above and attach.

Refer to Appendix E for the updated table.

Additional questions:

The table identifies that the flows for catchments 2 and 3 were calculated incorporating a climate change allowance.

- *Please confirm that the calculations for catchment 1 also include climate change?*
  Calculations are based on adjustments as per SWCOP. 10 year rainfall depth of **158.5mm** and a 100 year rainfall depth of **245.3mm**

It is proposed to discharge catchment 1 to the existing gully, much of which is an SEA. The increase in impervious area will increase the flows to this stream. Due to the steep topography, erosion both at the outfall and through the length of the stream is a significant risk. This does not appear to have been considered beyond that the site is already subject to the SMAF overlay. Outfall design will need to respond to the topography, the use of green outfalls should be considered. The details of this can be addressed at the resource consent stage at which time the actual likely increase in impervious area and flows to this catchment will be more accurately known. The design and extent of mitigation should be discussed with Healthy Waters.

- *Please clarify if there is any erosion in the stream currently?* The stream located west of the development has a significant vegetated riparian and a defined stream formation. No signs of erosions currently downstream was identified.

- *If there is existing erosion additional mitigation beyond that provided by SMAF will need to be investigated.* The outfall for catchment 1 shall be appropriately located to not cause erosion and shall be designed using green infrastructure principles, during detailed design of the stormwater network.

- *The SMP should be updated to reflect the above and identify additional information that will need to be addressed as part of the resource consent.*
  Section 6.2.3 has been updated to include erosion protection measure above.

Auckland Transport

The table in this section still states "On-site treatment of high contaminant yielding impervious areas through use of raingardens or proprietary devices that treat equivalent to 75% TSS or better." Whilst the report states that these devices shall be designed in accordance with AT's TDM, there still does not appear to be a consideration for alternatives beyond ruling out wetlands due to the slope of the site. Roadside raingardens on steep road (>5%) are also not acceptable due to safety issues with them protruding out of the ground unless these safety issues are addressed.

As per table 4 of the TDM, a pond or wetland is applicable to achieve water quality as per the requirements in GD01. The main constraints of a centralised treatment device are due to the larger area it requires with less flexibility to suit to the existing topography of the site. Hence, the reason for treatment at-source (road side) through utilising bioretention devices. At-source bioretention (raingardens or swales) will be designed to suit the contours of the proposed road through specific design. This provides flexibility on the slopes and multi-level treatment for the designed bioretention device. For gradients exceeding >5%, check dams shall be installed at regular intervals. As preferred by Auckland Transport, pre-cast raingarden is avoided as much as practical and concerns for protruding raingardens should not be an issue. An alternative is for a proprietary device such as filters to be utilised. However, it was understood that this was not AT's preferred option.

TABLE 4

Treatment /Management Option	New Roads	Existing Roads
Pond	T3	T3
Wetland	T2	T2
Swale /Vegetated swale*	T1*	T1*
Site specific Bioretention (lined/unlined)*	T1	T1
Soakage pits	T1	T1
Dry ponds	T2	T2
Proprietary Devices#	T2#	T2#
GPTs/Catchpit filters/filter screens#	T2#	T2#

* This would be T2, if private lots are to discharge to swale.

* Bioretention devices in this table do not include pre-cast concrete box rain gardens, which are considered a proprietary device.

All proprietary devices must have written approval from AT prior to design acceptance. The use of pre-cast concrete boxes for rain gardens require a departure from standard approval.

This section refers to tree pits being used to meet SMAF requirements. These are not acceptable devices to be vested, and it is requested that reference to these devices within the road corridor be removed.

References of tree pits for public treatment has removed to reflect version 1.2 of TDM guidelines for road drainage.

Yours faithfully,

John Duran
ENGINEER