CRANGCIVIL CONSULTING ENGINEERS

ENGINEERING

REMUERA PRECINCT PRIVATE PLAN CHANGE

PLAN CHANG

REPOR

Prepared for: Fletcher Residential Limited

Date: December 2023



Document Quality Assurance Statement

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This report has been prepared by Crang Consulting Ltd for the sole benefit of the client named on this report, with respect to the particular brief given to us and may also be relied upon for submission of a Resource Consent or Building Consent applications. The data and/or opinions contained in this report may not be used by any other party or for any other purpose without our prior review and agreement.

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- Appendix C EPA approved stormwater 100 year flow pipes
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- Appendix E Watermain consultation
- Appendix F Utilities consultation
- Appendix G Geotechnical Report

1 Introduction

1.1 Overview

Auckland Thoroughbred Racing has decided to divest approximately 6.2 hectares of land from the eastern corner of the Ellerslie Racecourse Precinct. FRL has purchased this area of land and has obtained resource consent (through the fast trach process to construct approximately 357 residential dwellings. The proposed 357 dwellings comprise a mix of detached, duplex and terrace houses, market apartments, and an apartment building for active retirement use. Building heights range from 1 to 7 storeys (above any basement levels). The Precinct is located at the western end of the racecourse site and is bound by Ladies Mile and Derby Downs Place. The area of land subject to this plan change is currently part of a Special Purpose – Major Recreation Facility Zone and a plan change is now proposed to recognise the consented residential development. The precinct is to be referenced as the Remuera Precinct.

The Precinct enables housing choice including both medium to high density living opportunities with development up to 25m in height provided within the THAB zones. Development of the Precinct is defined by identified publicly accessible open spaces, areas of private open space, existing mature Pohutukawa trees (combined with a 6m setback in their vicinity) and garden streets.

Movement through the precinct is provided two new public roads, one of which connects to Ladies Mile while the other connects to Derby Downs Place. Entry markers are proposed at these locations. A series of interconnected commonly owned access lots in combination with identified pedestrian routes provide internal linkages within and through the Precinct. An existing tunnel also connects Derby Downs Place with the infield of the racecourse.

Stormwater from the precinct is managed by the adopted Stormwater Management Plan for the precinct.

Regarding archaeological matters, FRL has obtained an authorisation from Heritage New Zealand for the earthworks required to prepare the site for development. The authorisation requires works to be completed in accordance with the Archaeological Management Plan which outlines processes and procedures that need to be followed.

The parcel of land, Lot 1, being a subdivision of underlying land parcel (LOT 8 DP 515118) is the parcel of land subject to this plan change application under the Proposed Auckland Unitary Plan Zoning map by Brewer Davidson Ltd (Refer Figure 2).

This report describes the relevant infrastructure, services and utilities that would be required to enable the development of Lot 1 under the Proposed Plan Change.



Figure 1 Site Location (Source: Auckland Council (AC) GIS)



Figure 2 Proposed Unitary Plan Zoning plan (source: Brewer Davison Drawing ZN-01)

1.2 Scope of Work

This report describes the required infrastructure upgrades to enable the plan change of the site which includes:

- Changes to landform including Earthworks and Sediment & Erosion Controls to enable the development of the land;
- Required road upgrades to existing public roads and intersections;
- Internal public roads called;
- Site remediation;
- Stormwater reticulation and stormwater management of the site;
- Wastewater reticulation and offsite upgrades
- Watermain reticulation and offsite upgrades
- Utility Services

There are other reports associated with the proposal that should be referred to when assessing the civil engineering. These include:

- Geotechnical Investigation Report by Initia Geotechnical Specialists Ltd.
- Site Contamination Report by Pattle Delamore Partners Ltd
- Traffic Report by Commute Ltd.
- Stormwater Management Plan by Wood & Partners Ltd
- Arborist report by Arbor Connect Ltd
- Archaeology Assessment by Clough & Associates Ltd
- Ecology Report by Fresh Water Solutions Ltd

1.3 Limitations

The report has been based off the information made available to Crang Consulting Ltd from the client, public sources and specific site investigation at the time of performing the assessment. Should further information become available regarding the site and the area around the site, Crang Consulting Ltd reserves the right to review the report with respect to the additional information.

2 Site Description

2.1 Existing Subdivision

The proposed plan change site is being created by a 2 lot subdivision of (LOT 8 DP 515118). The fast-track consent (FTC000064) has been issued and titling process is underway with draft title plans prepared for the 2 lot subdivision at the time of writing this report (RT reference Lot 1 = 1136511 (6.2167ha), Lot 2 = 1136512 Lot 2 (37.1500ha). Below is the approved LT plan for the site (Figure 3).



Figure 3 Existing Site Environment (Source: LINZ)

2.2 Existing Site Environment

The site is located at the eastern end of the Ellerslie Racecourse. Ladies Mile is located on the north eastern boundary and Derby Downs is located in the southern corner. The site is approximately 6.20Ha in area. A pond is located near Derby Downs and is used for the irrigation of the racecourse. The racecourse managers house is located in the eastern corner of the site.

The site has moderate slopes from Ladies Mile down to the Ellerslie Racecourse and the existing pond. The area around the pond is relatively flat. There are no protected trees within the site however there are some trees that are worthy of retention along the Ladies Mile frontage.

2.3 Current Land Use

Under the Auckland Unitary Plan, the site is zoned as Special Purpose - Major Recreation Facility zone.

2.4 Proposed Plan Change

Fletcher Residential Ltd are proposing a plan change of lot 1 to change the zoning of the site to a mixture of residential - mixed housing urban and Terraced Housing Apartment zoning plan and high level precinct plan has been prepared by Brewer Davidson. Based on this density it is estimated the total yield from the development site would be a maximum of 375 units/houses (refer Appendix B).

The infrastructure has been assessed based on this density and requirements for this zoning within the Auckland Unitary Plan.

3 Earthworks

3.1 Geology

The geology of the northern part of the site consists of non-engineered fill overlying residual weathered east coast bays formation soils (clays and silts). The non-engineered fill comprises of

silts, sands and gravels. The geotechnical engineer has advised that the majority of the nonengineered materials can be utilised and re-engineered to form suitable subgrades.

The southern part of the site (south of the existing pond) consists of an ash layer on top of basalt rock. The ash layer varies in thickness from 1.5m to 3m deep. The landform has been assessed by Initia geotechnical consultants and has been found to be appropriate for development. Please refer to Appendix G for further information

3.2 Earthworks

All earthworks will be subject to the existing AUP rules and standards, noting that the fast-track consent has already granted consent for earthworks over the site. Bulk earthworks are required to prepare the site for development. Existing non-engineered fills will be excavated and placed in fill. Any material that is not suitable for fill will be carted off site and disposed of at a location licensed to take such material. Any additional fill material will be imported to site as certified cleanfill material.

3.3 Erosion and Sediment Control

To provide soil conservation and protect surface water quality, erosion and sediment control measures will be provided in accordance with the Auckland Council - Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05).

The Contractor will install the approved erosion and sediment control measures prior to earthworks commencing and will be responsible for maintaining the controls throughout the duration of the earthworks operation (refer to Appendix A).

4 Roading and Accessways

A Traffic Assessment has been prepared by Commute Transportation Consultants. They have assessed, amongst other things, the safety of the existing and proposed roading network including proposed road widths, vehicle tracking and speed controls.

4.1 Existing Roading upgrade requirements

Commute have proposed upgrades to the surrounding existing road network including road widening on Ladies Mile, alterations to the Ladies Mile/Abbots Way intersection, the signalisation of the Derby Downs/Ladies Mile intersection and changes to the Derby Downs cul-de-sac head. The following works are proposed for existing road upgrades, all in accordance with the recommendations of the traffic engineer. These are:

- The widening of the existing legal road reserve to the east of the site to enable a median strip in Ladies Mile for right turning traffic into The Upper Loop Road.
- The addition of pedestrian crossings at the Ladies Mile/Abbotts Way intersection. This involves some alterations to the signal equipment, line markings, footpath works and signal phase changes.
- A median island opposite the eastern Upper Loop Road intersection. This is to prevent right turn movements into and out of the eastern leg of the Upper Loop Road.
- A new 1.8m wide pedestrian footpath along the frontage that links the footpath at Peach Parade through to the footpath opposite Marua Road.
- The Derby Downs/Ladies Mile intersection is to be signalised which will include widening of the southern leg of Ladies Mile within the existing legal road to provide a left turn bay for vehicles turning left from Ladies Mile on to Derby Downs, footpath works to allow for the installation of signal poles and remarking of the roads for the new lane layouts.

• The entrance into the development will require works to be undertaken on the cul de sac head and footpaths so that a seamless transition into the development occurs.

4.2 Proposed Roads

The site is accessed from Ladies Mile and Derby Downs with the proposed Upper and Lower Loop Roads. These roads have a legal width of 16m and a formed width of 6m plus parking bays. A 1.80m wide concrete footpath is proposed on both sides of the Upper and Lower Loop Roads. Road designs will comply with the Auckland Transport TDM standards with final designs to be provided at engineering approval stage. The treatment of stormwater runoff occurring from the new roads and accessways will be provided as a requirement of the stormwater management plan.

4.3 Proposed access lots

Proposed vehicular accessways and pedestrian accessways can comply with of Auckland Transport TDM standards. Pedestrian access is provided between the Upper and Lower Loop Roads along the side of the access lots.

A private 2.50m wide pedestrian path is proposed along the side of the racecourse boundary. This footpath will link Peach Parade through to Derby Downs and Lonsdale Street. An easement in gross – pedestrian right of way will be placed on the title covering this footpath.

5 Stormwater

5.1 Existing Stormwater

An existing 1950mm diameter stormwater pipeline runs under the site with a 18m deep manhole at its change in direction. Auckland Council constructed this pipeline in 2012 as part of the Waiatarua Catchment Stormwater Upgrade Project. The pipeline was to reduce the flood risk in the Greenlane East and Peach Parade areas. The Council agreed to allow the Auckland Racing Club's (now Auckland Thoroughbred Racing Incorporated (ATR)) future developments on its land to connect to this 1950 pipeline.

There was an existing irrigation pond is located on the site. This was used by the ATR for the irrigation of the racecourse and surrounds. Two pipelines discharge to the irrigation pond (currently being decommissioned). The first is a public 1200 dia stormwater pipe from the Derby Downs catchment. The second is a private arch culvert that collects stormwater from the racecourse catchment. The outlet from the irrigation pond is a 375 public pipe that discharges to the south down Lonsdale Street. This pond and pipework are currently being removed.

Overland flows from the current site occur from the irrigation pond across Derby Downs reserve to Lonsdale Street.



Figure 4 Existing Stormwater Pipe Network (Source: AC GIS)

5.2 Stormwater Management Plan (SMP)

A stormwater management plan has been prepared by Wood and Partners which has been approved and adopted by Healthy Waters for the site (refer appendix C for adoption letter). This management plan details the potential effects on the environment from stormwater discharges and the mitigation measures required to mitigate these effects. It also provides further details on the capacity of the stormwater network.

The key measures that have come out of the management plan for the civil engineering are:

- The reticulation of 1% annual exceedance probability (AEP) flows from the end of Derby Downs through to the 1950 diameter pipeline. Initial low flows will occur to the existing 375 diameter until capacity is reached.
- The installation of a new irrigation/detention pond within the racecourse infield (nearing completion under LUC60395369)
- The reticulation of the 10% AEP flows across the racetrack to the irrigation pond.
- The control of flows within the irrigation pond using a specifically designed outlet control structure (approved under EPA 60402076).
- The control of flows to the 1950 diameter pipeline using a control structure with orifice within an upstream manhole (approved under EPA 60402076) Refer Appendix C.
- reticulation of all the houses and roads to Auckland Council Stormwater Code of Practice
- Providing at source water quality for the access lots and public roads
- The inclusion of a swale along the racecourse boundary to prevent any 100 year storm flows occurring to the racecourse

The reasons for these measures have been detailed in the stormwater management plan.

5.3 Proposed Stormwater Design

The stormwater design will be completed to comply with Auckland Council's stormwater code of practice and region wide stormwater network discharge consent (through the SMP).

6 Wastewater

6.1 Existing Wastewater - condition and capacity

Discussions have occurred with Watercare over the most appropriate location for the site to connect its wastewater network. Watercare has advised that the Ellerslie Branch 1B transmission sewer is appropriate however to provide the capacity in the pipeline some stormwater separation works must be carried out within its catchment. Watercare's Ellerslie Branch 1B transmission sewer crosses the Ellerslie racecourse (Refer Figure 5 below).



Figure 5 Existing Wastewater Pipe Network (Source: AC GIS)

An additional wastewater line is located at Derby Downs and some connections can be provided to that sewer as the levels prevent connection to the transmission sewer.

6.2 Proposed Wastewater

The design for these connections has been completed and have been consented and constructed under (EPA No. ENG60396803). A copy of the approval along with the approved wastewater calculations are contained in Appendix D. The approval includes the stormwater separation works necessary to provide capacity in the transmission sewer.

Wastewater reticulation will be extended from the approved connection points and the drawings for this new network is included in the engineering plans in Appendix A.

7 Water and Services

7.1 Existing Water Main – condition and capacity

The site lies at the boundary of two water supply zones. There are two water supplies available with one from the 100mm diameter main on Derby Downs and the other supply from an existing public 100 diameter connection off the 200mm diameter main on Ladies Mile (refer Figure 6).



Figure 6 Existing Water Main Pipe Network (Source: AC GIS)

7.2 Proposed Water Main Works

Watercare was consulted over the water supply capacity and pressure zones. They advised that two sections of watermain need to be upgraded to ensure that the proposed development can be serviced. These upgrades are located on Ladies Mile and Marua Road where the existing 100 diameter mains will be replaced with 150 diameter pipes. The detail of these upgrades is included in the engineering plan set in Appendix A.

As well as the external upgrades a new watermain is required from Peach Parade, along the Ladies Mile frontage and connected to the main on the northern side of Ladies Mile near Marua Road. Internal reticulation will be connected to the Ladies Mile main and the Derby Downs watermain.

A copy of the correspondence with Watercare on the required upgrades and reticulation network is contained in Appendix E.

7.3 Fire Fighting

The proposed water reticulation will also provide for firefighting supplies and include fire hydrants at the required spacing. The apartment buildings will need specific designs completed for firefighting which will occur at building consent stage.

7.4 Utility Services

Advice has been received from Vector that the HV supply in the area is adequate to supply the development and a new LV supply will need to be installed within the development.

Telecommunication services are available on the existing roading network and can be extended into the development to provide communication services. Chorus has advised that there is sufficient capacity for development.

Copies of the correspondence with Vector and Chorus are contained in Appendix F.

8 Conclusion

It can be concluded that based on the above analysis and the ongoing applicability of the AUP provisions to any development of the site that there are no specific engineering related provisions that are considered to be required for this plan change. The following can be concluded regarding the civil engineering for the project:

- Earthworks can be undertaken to provide stable building platforms and complying road gradients. The proposed earthworks volumes and slopes are standard for a project of this nature.
- The environment can be protected during the earthworks operation by the installation of sediment controls that comply with Auckland Councils GD05 guideline document.
- Upgrades on the surrounding road network can be undertaken in accordance with the recommendations of the traffic engineer and in compliance with Auckland Transports TDM standards.
- An internal public and private roading network are proposed that also comply with the requirements of the traffic engineer and Auckland Transport.
- Stormwater treatment and runoff control can be undertaken in compliance with the stormwater management plan prepared by Wood and Partners and Councils stormwater code of practice. This includes a reticulation and overland flowpath system that conveys stormwater to a new irrigation/detention pond in the racecourse infield which discharges to the 1950 diameter pipeline located on site.
- A wastewater pipe network is proposed that will service the development. The connection point to the Ellerslie Branch 1B transmission sewer has been consented and constructed.
- A new watermain reticulation can be provided to service the development. Watercare have confirmed that the existing water supply network is adequate for the project subject to two external upgrades. These external upgrades are proposed to be completed as part of this project.
- Power and telecommunication services are available for the development of the site and this has been confirmed by Vector and Chorus.

It can be concluded that there are no infrastructure or civil engineering issues with undertaking the development.

APPENDIX A:

ENGINEERING DRAWINGS

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		YEAR	23	23	23							
RAWING NO.	DRAWING TITLE		DRAWIN	G REVISIO	DN							
C001-PC	COVER SHEET		0	1	1							
C200-PC	POTENTIAL FARTHWORKS PLAN - PLAN CHANGE		0	1	1							
C210 PC			0	1	1					-		
C210-FC			0	1	1							
C300-PC	KUADING PLAN - PLAN CHANGE		0	1	1							
C400-PC	DRAINAGE PLAN - PLAN CHANGE		0	1	1							
C500-PC	WATERMAIN PLAN - PLAN CHANGE		0	1	1							
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FLETCHER RESIDENTIAL LTD **REMUERA PRECINCT PRIVATE PLAN CHANGE**

CONSENT ISSUE













FLETCHER RESIDENTIAL LTD REMUERA PRECINCT PRIVATE PLAN CHANGE

WATERMAIN UPGRADE PLAN - PLAN CHANGE

DRAWN	TS		
DESIGNED	MW	A3	SHOWN
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CONSENT ISSUE

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18/12/2

18/09/2

27/07/2

DATE

APPENDIX B:

ZONING AND MASTERPLAN

(Refer to appendix's in Tattico Remuera Precinct plan change report S32 analysis)

APPENDIX C:

EPA APPROVED STORMWATER 100 YEAR FLOW PIPES



04 October 2022

Crang Consulting Limited C/O Vaughan Crang PO Box 42089 Orakei Auckland 1071

Dear Sir / Madam

ENGINEERING PLAN APPROVAL

Application Number(s):	ENG60402076
Applicant:	Auckland Thoroughbred Racing Incorporated
Proposed Activity(s):	A new stormwater line connecting Derby Downs catchment to the existing 1950 diameter stormwater drain and new stormwater connection pipes for "The Hill" development proposed in Ellerslie Racecourse
Address:	100 Ascot Avenue Greenlane Auckland 1051

Approval is hereby granted to construct the above proposed works 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:

 The proposed *subject* works shall be carried out in accordance with the attached annotated plans (noted below) and associated calculations and specifications, prepared by **Crang Consulting 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:

Project No	Drawing No.	Revision	Drawing Title	Dated
1402	C420	0	PROPOSED 100YR ARI STORMWATER PIPE INLET & OUTLET PLAN	16/08/2022
1402	C460	A	STORMWATER EXTENSION LONG SECTIONS	27/09/2022
1402	C461	0	POND OUTLET & INLET STRUCTURE DETAILS	16/08/2022
1402	C462	0	PROPOSED DRAINAGE PLAN 100YR ARI & OLFP CONNECTION DETAILS	16/08/2022
1402	C463	0	STORMWATER OUTLET & INLET STRUCTURE DETAILS	16/08/2022
1402	C464	A	STORMWATER OUTLET & INLET STRUCTURE DETAILS	27/09/2022
1402	C465	0	STORMWATER OUTLET & INLET STRUCTURE DETAILS	16/08/2022

- 2) This approval is valid for a period of two (2) years from this date and will lapse on 04/10/2024 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** (*Twenty Four*) 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 – LUC60395369-A

- 5) Copies of all relevant consents and approvals, and associated specifications, reports and supporting documents are to be kept onsite and available at all times.
- 6) 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.
- All works are to be undertaken and supervised by suitably qualified and experienced practitioners (SQEPs) carrying appropriate insurances. Evidence shall be provided at the preconstruction 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. Regulatory Engineering. The following conditions will guide you on the process to achieve compliance.

- 8) The Developer's Representative shall give Council's Development Engineer at least 5 (five) 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.

Please phone Scott Bellve on 021 526 571 for booking inspections/ site meetings.

- 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.

- 9) Optional: "Commencement condition" may be relevant for large projects where pre-construction meeting is long in advance of works beginning. The Developer or their representative shall advise the Council's Development Engineer in writing of their intention to commence the approved works ten working days prior to site establishment.
- 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".
- 11) 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 as-built plans
 - Statement of Certification: Engineering approval
 - Schedule of Land and Assets to Vest
 - CCTV pipe inspections
 - All test and inspection results (e.g. Benklemen beam/scala penetrometer results, Copies of QAM inspection sheets).
- 12) 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.

Special conditions / Advices:

Stormwater:

• Please note that it is the developer's responsibility to notify parties affected by the proposed works at least 48 hours prior to commencement of subject works.

• The vertical separation between the proposed drain and existing utilities need to comply with the Watercare's Code of Practice. High density polystyrene pad to installed wherever the separation distance does not comply.

Earthworks: Note: Usually Earthworks conditions are considered under the resource consent so these conditions should not be necessary except in specific circumstances.

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

Mushifa

Imran Mustafa Development Engineer Imran.Mustafa@aucklandcouncil.govt.nz









Buoyancy Calculation for Manholes

Project: Fletcher Hills Job No. 1403 Calculation By: Marcel Waldvogel Date: 30/09/2022 anhole Number: SWMH 16/2

 $References: \ http://www.concretepipe.org/wp-content/uploads/2014/09/DD_41.pdf$

Buoyancy Calculation for Manholes

Project: Fletcher Hills Job No. 1403 Calculation By: Marcel Waldvogel Date: 30/09/2022 anhole Number: SWMH 16/3

References: http://www.concretepipe.org/wp-content/uploads/2014/09/DD_41.pdf

Page 1 of 1

DESIGN OF 1200 DIA. RRJ DRAINAGE PIPE

Client And Project Details

Date: 27-Sep-2022

Job number:	1403		Design:	1200mm 1-6.5m fill
Client:	Fletchers		Designer:	Marcel Waldvogel
Project:	Fletcher Hills		Company:	Crang
Description:			File:	pipe class.ppr
Design Parame	eters		_	natural ground surface or underside of sleeper
Installation Con	dition:	trench		
Pipe Nominal D	Diameter (mm):	1200		
Pipe External D)iameter, D (mm):	1372		
Pipeline Orienta	ation:	skew		
Soil Type:		wet clay		
Soil Density (kN	N/m³):	20		
Soil Parameter	Kμ:	0.1100		
Trench Width, E	B (m):	1.829		
Height Of Fill, H	l (m):	6.500		
Flexible Pavem	ent Type:	asphalt		
Flexible Pavem	ent Density (kN/m3):	21.000		
Flexible Pavem	ent Thickness (m):	0.000		
Effective Height	t Of Fill, He (m):	6.500		
Support Type:		H2		
Bedding Factor		2.0		
			NTO	
			N.1.5	в в

In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.0	Wq/1.5	Тс	Pipe Class
earth	6.500	82.5		82.5	4
HN-85%	6.500	82.5	1.7	84.2	4
HN	6.500	82.5	1.9	84.4	4
НО	6.500	82.5	3.5	85.9	4

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads:	earth + HO standard vehicle
Minimum Test Load:	Tc = 82.5 + 3.5 = 85.9 kN/m

Adopt 1200 dia. Class 4 RRJ pipe (1200/4 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. A nominal pipe wall thickness of 73 mm has been assumed.

Page 1 of 1

DESIGN OF 1200 DIA. RRJ DRAINAGE PIPE

Client And Project Details

Date: 27-Sep-2022

Job number: 1403	Design: 1200mm 6.5-18m fill
Client: Fletchers	Designer: Marcel Waldvogel
Project: Fletcher Hills	Company: Crang
Description:	File: pipe class.ppr
Design Parameters	natural ground surface or underside of sleeper
Installation Condition: trench	
Pipe Nominal Diameter (mm): 1200	
Pipe External Diameter, D (mm): 1372	
Pipeline Orientation: skew	
Soil Type: wet clay	
Soil Density (kN/m ³): 20	
Soil Parameter K _{μ} : 0.1100	
Trench Width, B (m): 1.829	
Height Of Fill, H (m): 18.000	
Flexible Pavement Type: asphalt	
Flexible Pavement Density (kN/m3): 21.000	
Flexible Pavement Thickness (m):0.000	
Effective Height Of Fill, He (m): 18.000	
Support Type: H2	
Bedding Factor: 2.0	
	N.T.S.

In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.0	Wq/1.5	Тс	Pipe Class
earth	18.000	134.6		134.6	6
HN-85%	18.000	134.6	0.5	135.1	6
HN	18.000	134.6	0.5	135.1	6
НО	18.000	134.6	1.0	135.6	6

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads:	earth + HO standard vehicle				
Minimum Test Load:	Tc = 134.6 + 1.0 = 135.6 kN/m				

Adopt 1200 dia. Class 6 RRJ pipe (1200/6 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. A nominal pipe wall thickness of 73 mm has been assumed.

Page 1 of 1

DESIGN OF 375 DIA. RRJ DRAINAGE PIPE

Client And Project Details

Date: 27-Sep-2022

Job number: 1403	Design: 375mm 1-3.5m no traffic
Client: Fletchers	Designer: Marcel Waldvogel
Project: Fletcher Hills	Company: Crang
Description:	File: pipe class.ppr
Design Parameters	natural ground surface or underside of sleeper
Installation Condition: trench	
Pipe Nominal Diameter (mm): 375	
Pipe External Diameter, D (mm): 445	
Pipeline Orientation: skew	
Soil Type: wet clay	
Soil Density (kN/m ³): 20	
Soil Parameter K _µ : 0.1100	
Trench Width, B (m): 0.745)
Height Of Fill, H (m): 3.500	
Support Type: H2	
Bedding Factor: 2.0	
	N.T.S. B

In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.0	Wq/1.5	Тс	Pipe Class
earth	3.500	16.3		16.3	2

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads:earthMinimum Test Load:Tc = 16.3 kN/m

Adopt 375 dia. Class 2 RRJ pipe (375/2 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. A nominal pipe wall thickness of 32 mm has been assumed.

Page 1 of 1

DESIGN OF 1050 DIA. RRJ DRAINAGE PIPE

Client And Project Details

Date: 27-Sep-2022

Job number: 1403	Design: 1050 up to 10m deep
Client: Fletchers	Designer: Marcel Waldvogel
Project: Fletcher Hills	Company: Crang
Description:	File: pipe class.ppr
Design Parameters	natural ground surface or underside of sleeper
Installation Condition: trench	
Pipe Nominal Diameter (mm): 1050	
Pipe External Diameter, D (mm): 1220	
Pipeline Orientation: skew	
Soil Type: clayey sand	
Soil Density (kN/m ³): 18	
Soil Parameter K _µ : 0.1500	
Trench Width, B (m): 1.664	
Height Of Fill, H (m): 10.000	
Support Type: H2	
Bedding Factor: 2.0	
	N.T.S. B

In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.0	Wq/1.5	Тс	Pipe Class
earth	10.000	69.4		69.4	4

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads: earth Minimum Test Load: Tc = 69.4 kN/m

Adopt 1050 dia. Class 4 RRJ pipe (1050/4 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. A nominal pipe wall thickness of 64 mm has been assumed.

8 August 2023

Fletcher Residential Living James Crews – Senior Development Manager 810 Great South Road Penrose Auckland via email: JCrews@frl.co.nz

Dear James

Re: Adoption of Stormwater Management Plan under Auckland Council Regionwide Stormwater Network Discharge Consent – HW Reference NDC-2023-009

Healthy Waters holds a Regionwide Network Discharge Consent (DIS60069613)(NDC) for the diversion and discharge of stormwater from the public stormwater network.

Healthy Waters have received and reviewed the proposed stormwater management plan (SMP) submitted for the residential development known as The Hill:

 'Stormwater Management Plan – The Hill, 100 Ascot Avenue, Greenlane, Fletcher Residential Living, Final', dated 7 June 2023, Version 8 prepared by Wood & Partners Consultants Ltd

The proposed SMP meets the requirements of Schedule 4 and Schedule 2 of the NDC and the proposal meets the criteria in Condition 13c for adoption under the process set out within Schedule 8. The SMP is approved to be adopted into Schedule 10 of the NDC. All development and stormwater management must be undertaken in accordance with the adopted SMP

Amendments or updates to the SMP can be made by following the processes set out in Condition 16A of the NDC. You can find a copy of the NDC conditions on the Auckland Design Manual <u>www.aucklanddesignmanual.co.nz/ndc</u>.

Please note that this approval does not represent Auckland Council agreement for the detailed design of the stormwater system, ultimate vesting of any device or infrastructure, nor provision of any Council funding. These approvals are subject to separate engineering reviews and other processes that are not covered by the network discharge consent. For assets in the road corridor, Auckland Transport are the reviewing and approval authority at EPA stage.

If you have any questions please contact Mark Iszard Mark.Iszard@aucklandcouncil.govt.nz

Kind regards

Gemma Chuah Principal – Resource Management Healthy Waters Infrastructure and Environmental Services

APPENDIX D:

WASTEWATER CALCULATIONS AND APPROVED WASTEWATER EPA

Engineering Approval

- issued by Auckland Council - Regulatory Engineering Department

23 June 2022

Fletcher Residential Limited C/O Hinsan Li PO Box 99922 New Market 1149

Dear Sir/Madam,

DECISION ON AN APPLICATION FOR ENGINEERING PLAN APPROVAL – AMENDMENT 1 - WW

Application Number:	ENG60396803
Applicant:	The Auckland Racing Club Incorporated
Proposed Activity:	Wastewater – Amendment 1
Location of work:	100 Ascot Avenue Greenlane Auckland 1051

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

The amended drawings have been reviewed and appear to generally meet the engineering standards of Council / Watercare. On that basis engineering works may proceed in accordance with the **following approved annotated drawings** prepared by **Crang Civil Consultants Ltd** subject to the following conditions:

Table of relevant plan numbers and amendments:

Project No.	Drawing No.	Revision	Drawing Title	Dated
1402	C402	A	PROPOSED WASTEWATER PLAN SHEET 1	28/04/2022
1402	C403	A	PROPOSED WASTEWATER PLAN SHEET 2	28/04/2022
1402	C455	A	PROPOSED WASTEWATER LONG SECTION	28/04/2022

As requested by the applicant's engineer, the WW layout and long-section drawing included in the previous **EPA Approval dated 10/06/2022** has been amended. The amended drawing includes some adjustments to the proposed sewer as per below.

Line was changed in size to 225 uPVC during RFI stage but approval was incorrectly issued by Watercare for the 150mm line.

Public WW – Amendment 1

All wastewater work shall comply with the approved plans and Watercare Engineering Standards. Please comply with the WSL review - application # EPA-127750 Amendment 1 dated 23/06/2022

Applicant needs to supply Development Engineering/AC the post construction video of the public drains together with other documents.

Inspection of Works

The Developer's Representative shall give Watercare's Engineer at least **5 (five)** working days' notice of the on-site **pre-construction meeting**. You can arrange the pre-construction meeting by emailing <u>preinspection@water.co.nz</u> 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.

As built plans and documentation - Please note, that for public water and wastewater assets, the consent holder will need to liaise with Watercare Services Ltd directly for as built and completion documentation requirements for Certificate of Acceptance (COA). Then Watercare shall e-mail the accepted as-built plans to engineeringcentral.asbuilts@aucklandcouncil.govt.nz to complete the asset vesting process and close out the consent.

A final inspection is to be carried on site with all appropriate personnel. This includes the Developer's representative and Watercare Development Engineer.

Note: Watercare Services Ltd (WSL) shall be responsible for all new connections to the public water and wastewater networks.

The wastewater drainage works shall be undertaken by a Watercare approved contractor or registered drain layer in conformance with Council / WSL regulations and requirements, under WSL's inspection. The applicant shall inform Development Engineering/AC and Watercare of the registered drain layer's name, address, and contact phone number.

The above proposed wastewater drawings shall supersede the previously approved WW drawings. All other conditions as included in the **EPA approval letter of dated 10/06/2022** shall be complied with during the proposed wastewater works. Any stormwater amendment is not included in this approval.

Yours faithfully

Mushifa

Imran Mustafa Development Engineer Imran.Mustafa@aucklandcouncil.govt.nz

Attachment – EPA Approval Plan Amend. 1 - WW

Wastewater Discharge Calculation

Project	The Hill Ellerslie
Client	Fletcher Residential Ltd
Calculated By	Vaughan Crang
Check By	Marcel Waldvogel
Date	3-Mar-23

Based on Watercare (Water and Wastewater Code of Practice)

Design Parameters	
Design Flow (Residential) 180 L/p/d	Peak wet weather flow factor 6.7
Peak self cleansing flow factor 3	Number of people per dwelling: 3.0
Common Building (1000 m ²) 15/d/m ²	Table 5.1.3
Minimum self cleansing velocity 0.75m/s	Peak dry weather flow must be < 50% pipe capacity
ł	Value = 1.5

PROPOSED WASTEWATER TO THE ELLERSLIE No 1 TRANSMISSION SEWER

Use	No. of dwellings	Approx Persons	ADWF Design Flow (L/d)	PDWF / Self- Cleansing Design Flow (L/d)	PWWF Design Flow (L/d)
1.5 - 3 bed apartment	222	666	119880	359640	599400
Retirement lite 1.5-2 bed	61	91.5	16470	49410	82350
3-4 bed detached and trrace	67	201	36180	108540	242406
TOTALS	350	958.5	2.00	5.99	10.70

	Pipe Diameter	Minimum Grade	Capacity (I/s)	Velocity m/s]
	150	0.75%	13.6	0.75	minimum grade achieved
	Design Value L/s	q/qf	Relative Depth, y/d	Relative Velocity	Comments
weather Flow	10.70	0.79	0.73	N/A	PWWF depth <75% therefore ok!
g Flow	5.99	0.44	0.5	0.89	PDWF depth <50% therefore ok!

Minimum grade of 0.75% where less than 200 dwellings. 0.72% grade acceptable as 350 dwellings and achieved self cleansing velocity and <50% of pipe depth.

PROPOSED WASTEWATER TO THE DERBY DOWNS RESERVE SEWER

Self Cleansing Flow

Use	No. of dwellings	Approx Persons	ADWF Design Flow (L/d)	PDWF / Self- Cleansing Design Flow (L/d)	PWWF Design Flow (L/d)
1.5 - 3 bed apartment	0	0	0	0	0
Retirement lite 1.5-2 bed	1	1.5	270	810	1350
3-4 bed detached and trrace	24	72	12960	38880	86832
TOTALS	25	73.5	0.15	0.46	1.02
	Pipe Diameter	Grade	Capacity (I/s)	Velocity m/s	1
	150	0.75%	13.6	0.77	minimum grade achieved
	Design Value L/s	q/qf	Relative Depth, y/d	Relative Velocity	Comments
Peak wet weather Flow	1.02	0.08	0.55	N/A	PWWF depth <75% therefore o

0.03

0.15

0.40

PDWF depth <50% therefore ok!

0.46

Minimum grade is 0.75% for self cleansing for between 20 and 200 dwellings - achieved.

APPENDIX E:

WATERMAIN CONSULTATION

Marcel Waldvogel

From: Sent:	JShao (James) <james.shao@water.co.nz> Monday, 29 November 2021 3:56 pm</james.shao@water.co.nz>				
То:	Vaughan Crang				
Cc:	lGotelli (Ilze)				
Subject:	100A Ascot AVE Greenlane_CON-107595				
Attachments:	Ellerslie Racecoure The Hill Upgrades.pptx				
Follow Up Flag:	Follow up				
Flag Status:	Completed				

Hi Vaughan,

Our planning team has provided the following water and wastewater capacity and network upgrading assessment regarding the 370 units development proposed for the site: 100A Ascot AVE Greenlane.

(1). Regarding Water Supply

'Hi James

Please find attached the required upgrades for the proposed development.

Summary:

- Ladies Miles Based on resilience considerations (supply form a single 200mm WM) to the new development and existing properties it is required that a new 150mm WM is installed along the development frontage (as per CoP 6.3.8.2). Refer to attached drawing.
- Derby Downs The current network has existing network constraints which will required upgrading. The existing feed from the Michaels Ave BSP is predominately 150mm but there two 100mm sections which require upsizing. Refer to attached drawing.

Many Thanks'

(2). Regarding Wastewater Supply

'Hi James,

The proposed development is planned to be connected to Branch 1B and subsequently to Branch 1 that has existing capacity constraints.

There are 3 EOP structures downstream of the proposed development in the vicinity of Woodley Avenue and Entrican Avenue that are predicted to overflow frequently. The additional flows from the proposed development of this size will most likely increase overflow frequency and volume from those EOPs, which is not acceptable.

Therefore, the applicant needs to be informed that there may be requirements to take some measures to mitigate potential increase of the overflow frequency and volume from the downstream EOPs. One of the measures can be reduction of the wastewater flows in the downstream network by targeted separation of combined sewer network in the other parts of the catchment.

This option will need to be further investigated internally by Watercare before we can put it as a condition. However, if we need to respond to this enquiry urgently, then the applicant needs to be made aware of this potential requirement.

Please contact me if you want to discuss this further.

Best regards'

--

Kind regards,

James Shao | Development Engineer, Developer Services Watercare Services Limited Mobile: 021 419 403 Customer service line: +64 9 442 2222 Postal address: Private Bag 92 521, Victoria Street West, Auckland 1142, New Zealand Physical address: 73 Remuera Road, Remuera, Auckland 1050, New Zealand Website: www.watercare.co.nz

APPENDIX F:

UTILITIES CONSULTATION

Chorus Property Development Team PO Box 9405 Waikato Mail Centre Hamilton 3200 Telephone: 0800 782 386 Email: <u>develop@chorus.co.nz</u>

19 November 2021

C/- Crang Civil

CHORUS

Chorus Ref #: Your Ref #:

RUE68739

Attention: Vaughan Crang

Dear Sir / Madam

Property Development – RUE: 100 Ascot Avenue, Remuera. Estimate for 370 Connections. SDU & MDU

Thank you for your enquiry regarding the above subdivision.

Chorus is pleased to advise that, as at the date of this letter, we would be able to provide ABF telephone reticulation for this property development. In order to complete this reticulation, we require a contribution from you to Chorus' total costs of reticulating the development. Chorus' costs include the cost of network design, supply of telecommunications specific materials and supervising installation. At the date of this letter, our estimate of the contribution we would require from you is \$292,905.00 (including GST).

We note that (i) the contribution required from you towards reticulation of the development, and (ii) our ability to connect the subdivision to the Chorus network, may (in each case) change over time depending on the availability of Chorus network in the relevant area and other matters.

If you decide that you wish to undertake reticulation of this property development, you will need to contact Chorus (see the contact details for Chorus Property Development Team above). We would recommend that you contact us at least 3 months prior to the commencement of construction at the subdivision. At that stage, we will provide you with the following:

- confirmation of the amount of the contribution required from you, which may change from the estimate as set out above;

- a copy of the Contract for the Supply and Installation of Telecommunications Infrastructure, which will govern our relationship with you in relation to reticulation of this property development; and

- a number of other documents which have important information regarding reticulation of the property development, including - for example - Chorus' standard subdivision lay specification.

Yours faithfully

Geordie Rumbles Property Development Coordinator

17 November 2021

Crang Civil 1016A Great South Road, Penrose, Auckland

Attention: Vaughan Crang By Email: <u>Vaughan@crangcivil.co.nz</u>

Dear Vaughan

Supply Availability for The Hill Development on Ellerslie Racecourse, Auckland

Further to your recent correspondence regarding availability of supply for electricity for the proposed The Hill Development on Ellerslie Racecourse (about 1.75MVA installed capacity for up to 571 new dwellings), at the time of this enquiry, Vector can confirm the following:

Electrical Reticulation

- 1.1 Vector Limited is the Electrical Operator of the distribution system which will provide Line Function Services to the individual Points of Supply within the development.
- 1.2 Vector has available capacity in the surrounding high voltage (HV) network.
- 1.3 Installation of new low voltage (LV) cables and equipment will be required, at the customer's cost, to provide this development with points of supply for each of the residential unit.

Please do not hesitate to contact me on 09 978 8370 if you have any further questions.

Regards

Linnette Refoy Connections & Projects Coordinator

Vector Limited Carlton Gore Road PO Box 99882 Newmarket Auckland 1149 +64 9 978 7788 / vector.co.nz

Marcel Waldvogel

From:	IGotelli (Ilze) <ilze.gotelli@water.co.nz></ilze.gotelli@water.co.nz>
Sent:	Tuesday, 14 December 2021 11:55 pm
То:	James Crews (Fletcher Building)
Cc:	Fabian Wineera (Fletcher Living); Aidan Donnelly (FRL); Hinsan Li (Fletcher Living);
	Gracen Luka (Fletcher Building); SMcGuinness (Sophie) 2; Vaughan Crang; JShao (James); Mark Iszard
Subject:	FW: Ellerslie - the Hills Wastewater

Hi James

This email is to follow up on the discussion last week on the Ellerslie – the Hills proposal. Based on the discussion at the meeting last week and follow up with the Watercare team, we set out responses to the questions in your email.

1. Can Watercare please confirm what works are programmed to happen locally (if any) as part of Inflow and Infiltration (I&I) reduction programme and local network renewals, and when is this happening?

Investigations within this wastewater sub-catchment are very preliminary at this stage and are not likely to align with the planned development staging of the Hills. The I&I work programme for this area will be aligned with Auckland Councils Eastern Isthmus Water Quality Improvement Programme which is being funded in part by the Water Quality Targeted Rate. Based on the experiences of the similar western Isthmus programme, the physical works in the area would not likely begin until 2026-2028, although, early investigations could begin early next year.

As part of this area is combined network, there is the opportunity for the removal of the discharge from roadside catchpits from the combined network to free up some capacity within the wastewater network. Watercare has sent through a rough area of interest map for Fletchers to consider and investigate opportunities around removing Stormwater runoff from the combined network.

Any assessment by Fletcher's should use the 6 month storm event to assess peak flow rates runoffs from.

2. Is there a tipping point for The Hill site before capacity issues kick in? Is it 100 homes or is it zero?

Currently there is no additional capacity within the Branch 1B available to service a development of this size and scale. Current modelling is indicating the network is at maximum wet weather capacity.

3. Can Watercare please confirm what specifically they are suggesting (scope and cost) as works to be completed on the local network to facilitate capacity for the Hill site?

The scope of work needs to be further investigated but likely to involve freeing up capacity by removing Stormwater flows into the combined network. Road catch pits are seen as 'early' wins, however this option needs to be further assessed and a technical solution developed.

4. FRL cannot complete works to private drainage (off site), so we assume this is a funding discussion only

For works on private properties, Watercare and Auckland Council would typically lead this work programme and recover the costs via different funding mechanisms.

For the early works within the roading corridor, there is the option that Fletcher undertakes these works themselves under the necessary Resource Consent and Engineering Approvals. Watercare and Auckland Council would work with you to agree these works.

5. FRL will need to understand timing of works required to create this capacity, to ensure this does not affect our development programme.

As discussed in the meeting, the enabling infrastructure should be able to be installed within the Racecourse itself to help meet ATRs timeframes regarding the track improvement works.

The connection of the development to the network is dependent on the capacity being made available in Branch 1B. Given the option of roadside catchpit separation (which still needs to be investigational and agreed), this could likely be undertaken by you within the next 2-3 years in parallel with your development.

6. Are IGCs considered part of the funding requirement for this solution and would Watercare consider a portion of early payment of ICGs as an option?

This work would not be IGC funded. While there are existing capacity issue in the Branch Sewer, the proposed development was not zone for residential development and will create additional wastewater flows. The stormwater separation works will need to be funded by Fletcher.

Regards Ilze

Ilze Gotelli | Head of Major Developments

Watercare Services Limited DDI: +64 9 539 7806 Mobile: +64 21 831 470 Customer service line: +64 9 442 2222 Postal address: Private Bag 92 521, Wellesley Street, Auckland 1141, New Zealand Physical address: 73 Remuera Road, Remuera, Auckland 1050, New Zealand Website: www.watercare.co.nz

Respect	Excellence	Kalaz it happen	Accountability	One taom
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APPENDIX G:

GEOTECHNICAL REPORT

(Refer to appendix's in Tattico Remuera Precinct plan change report S32 analysis)