I hereby give notice that a hearing by commissioners will be held on:

Date:	**Monday 25 March and Tuesday 26 March 2024**
Time:	**9.30am**
Meeting room:	**Main hall**
Venue:	**Papatoetoe Town Hall, 31 Saint George Street Papatoetoe, Auckland**

PRIVATE PLAN CHANGE 90

APPLICATION MATERIAL

8 SPARKY ROAD, OTARA

HIGHBROOK LIVING LIMITED

COMMISSIONERS

Chairperson	**Peter Reaburn (Chairperson)**
Commissioners	**Lee Beattie**
	James Whetu

Chayla Walker
KAITOHUTOHU WHAKAWĀTANGA
HEARINGS ADVISOR

Telephone: 09 890 2009 or 027 231 5937
Email: chayla.walker@aucklandcouncil.govt.nz
Website: www.aucklandcouncil.govt.nz

Note: The reports contained within this document are for consideration and should not be construed as a decision of Council. Should commissioners require further information relating to any reports, please contact the hearings advisor.

WHAT HAPPENS AT A HEARING

Te Reo Māori and Sign Language Interpretation
Any party intending to give evidence in Māori or NZ sign language should advise the hearings advisor at least ten working days before the hearing so a qualified interpreter can be arranged.

Hearing Schedule
If you would like to appear at the hearing please return the appearance form to the hearings advisor by the date requested. A schedule will be prepared approximately one week before the hearing with speaking slots for those who have returned the appearance form. If changes need to be made to the schedule the hearings advisor will advise you of the changes.
Please note: during the course of the hearing changing circumstances may mean the proposed schedule may run ahead or behind time.

Cross Examination
No cross examination by the applicant or submitters is allowed at the hearing. Only the hearing commissioners are able to ask questions of the applicant or submitters. Attendees may suggest questions to the commissioners and they will decide whether or not to ask them.

The Hearing Procedure
The usual hearing procedure is:

- **The chairperson** will introduce the commissioners and will briefly outline the hearing procedure. The Chairperson may then call upon the parties present to introduce themselves. The Chairperson is addressed as Madam Chair or Mr Chairman.
- **The applicant** will be called upon to present their case. The applicant may be represented by legal counsel or consultants and may call witnesses in support of the application. After the applicant has presented their case, members of the hearing panel may ask questions to clarify the information presented.
- **Submitters** (for and against the application) are then called upon to speak. Submitters' active participation in the hearing process is completed after the presentation of their evidence so ensure you tell the hearing panel everything you want them to know during your presentation time. Submitters may be represented by legal counsel or consultants and may call witnesses on their behalf. The hearing panel may then question each speaker.
    - Late submissions: The council officer's report will identify submissions received outside of the submission period. At the hearing, late submitters may be asked to address the panel on why their submission should be accepted. Late submitters can speak only if the hearing panel accepts the late submission.
    - Should you wish to present written evidence in support of your submission please ensure you provide the number of copies indicated in the notification letter.
- **Council Officers** will then have the opportunity to clarify their position and provide any comments based on what they have heard at the hearing.
- The applicant or their representative has the right to summarise the application and reply to matters raised by submitters. Hearing panel members may further question the applicant at this stage. The applicants reply may be provided in writing after the hearing has adjourned.
- **The chair** will outline the next steps in the process and adjourn or close the hearing.
- If adjourned the hearing panel will decide when they have enough information to make a decision and close the hearing. The hearings advisor will contact you once the hearing is closed.

Please note
- that the hearing will be audio recorded and this will be publicly available after the hearing
- catering is not provided at the heari

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Highbrook Private Plan Change Request to the Auckland Unitary Plan (Operative in Part)

Prepared for Highbrook Living Limited

PLANNING REPORT

Job No: 64872

Version: Final

Date of Issue: 19/08/2022

ACKNOWLEDGEMENT

DOCUMENT APPROVAL AND REVISION HISTORY

Document title	Highbrook Private Plan Change Request to the Auckland Unitary Plan (Operative in Part)
	Planning Report
Prepared for	Highbrook Living Limited
Version	Final
Date	19 August 2022
Filename	64872

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Reviewer	
	Richard Black
	Planning Manager

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1 THE APPLICANT AND PROPERTY DETAILS

To:	Auckland Council
Application:	Highbrook Private Plan Change Request to the Auckland Unitary Plan (Operative in Part)
Applicant:	Highbrook Living Limited
Address for Service:	Babbage Consultants Limited Level 4, 68 Beach Road Auckland Central 1010 Attention: Sukhi Singh Email: sukhi.singh@babbage.co.nz
Site Location	8 Sparky Road, Otara, Auckland
Legal Description	Lot 2 DP 209362
Refer to Appendix 3 for AUP(OP) Planning Maps illustrating the key provisions mentioned below applying within the Plan Change area.	
Zoning:	Business - Light Industry Zone Coastal - Coastal Transition Zone
Precinct:	None
Designations:	Designation 6714, State Highway 1: To undertake maintenance, operation, use and improvement to the State Highway network, Designations, New Zealand Transport Agency Designation 1102, Protection of aeronautical functions - obstacle limitation surfaces, Auckland International Airport Ltd
Modifications:	None
Overlays:	Infrastructure: National Grid Corridor Overlay - National Grid Subdivision Corridor (extends marginally into Plan Change area)
Controls:	Coastal Inundation 1 per cent AEP Plus 1m Control - 1m sea level rise Macroinvertebrate Community Index - Exotic Macroinvertebrate Community Index - Native Macroinvertebrate Community Index – Urban
Record of Title:	Refer to **Appendix 1**

2 INTRODUCTION

2.1 Under Clause 21 of Schedule 1 of the Resource Management Act 1991 ("**RMA**"), any person may request a change to a district or regional plan (including a regional coastal plan). Clause 22 of Schedule 1 of the RMA states that the plan change request must be made to the appropriate local authority in writing and:

- Explain the purpose of and reasons for the plan change request;
- Contain an evaluation report prepared in accordance with section 32 of the RMA for the plan change request; and
- Where environmental effects are anticipated, the plan change request shall describe those effects, taking into account clauses 6 and 7 of Schedule 4, in such detail as corresponds with the scale and significance of the actual or potential environmental effects anticipated from the implementation of the change, policy statement or plan.

2.2 This Planning Report has been prepared in support of a Private Plan Change Request ("**PC**") to the Auckland Unitary Plan (Operative in Part) ("**AUP(OP)**") on behalf of Highbrook Living Limited.

2.3 The PC area is approximately 4ha, forming part of the larger site located at 8 Sparky Road, Ōtara. The full site at 8 Sparky Road is approximately 35ha in area, and was the location of the former Ōtāhuhu Power Station, which is currently being dismantled. The full site is currently zoned Business – Light Industry Zone.

2.4 The PC Request is set out in **Appendix 2**. In brief, it seeks to:

- Rezone 4.4ha of land from Business - Light Industry Zone to Residential - Terrace Housing and Apartment Buildings Zone ("**THAB**").
- Introduce a new Precinct into Chapter I Precincts (South) of the AUP(OP) to implement bespoke provisions specially to address two resource management matters:

a) manage adverse transportation effects on the surrounding road network, in particular Highbrook Drive and the Highbrook Drive/State Highway 1 ("**SH1**") roundabout.

b) protect activities sensitive to noise from adverse health and amenity effects rising from road traffic noise associated with the operation of SH1 and Highbrook Drive.

2.5 A precinct approach is necessary in this case to ensure the implementation of bespoke objectives, policies and rules framework to appropriately manage transportation effects of residential development on Highbrook Drive and SH1/Highbrook Drive roundabout.

2.6 On 18 August 2022, Auckland Council notified three plan changes to the AUP(OP). The intention of each plan change is as follows:

- *Plan Change 78: Intensification*
  - Implements the Government's mandatory intensification requirements under the National Policy Statement on Urban Development ("**NPS-UD**") and the mandatory Medium Density Residential Standards ("**MDRS**").
- *Plan Change 79: Amendments to the transport provisions*
  - Aims to manage impacts of development on Auckland's transport network, with a focus on pedestrian safety, accessible car parking, loading and heavy vehicle management, and catering for EV-charging and cycle parking.
- *Plan Change 80: RPS Well-Functioning Urban Environment, Resilience to the Effects of Climate Change and Qualifying Matters*
  - Integrates the concepts and terms, well-functioning urban environment, urban resilience to the effects of climate change and qualifying matters, into the objectives and policies in several chapters of the Regional Policy Statement ("**RPS**").

2.7 The PC Request does not seek to amend any other provisions in the AUP(OP), instead it relies on the full suite of overlays and Auckland-wide provisions to apply within the PC area and its proximity. It is considered that this Plan Change Request can be processed

concurrently with the above-mentioned Council initiated Plan Changes as the approach of the PC Request is to rely on the implementation of the full suite of provisions in the THAB Zone (all objectives, policies and rules) to delivery high quality residential development within the PC area.

2.8 The PC Request is informed by the following specialist reports (set out in **Appendix 4)**:

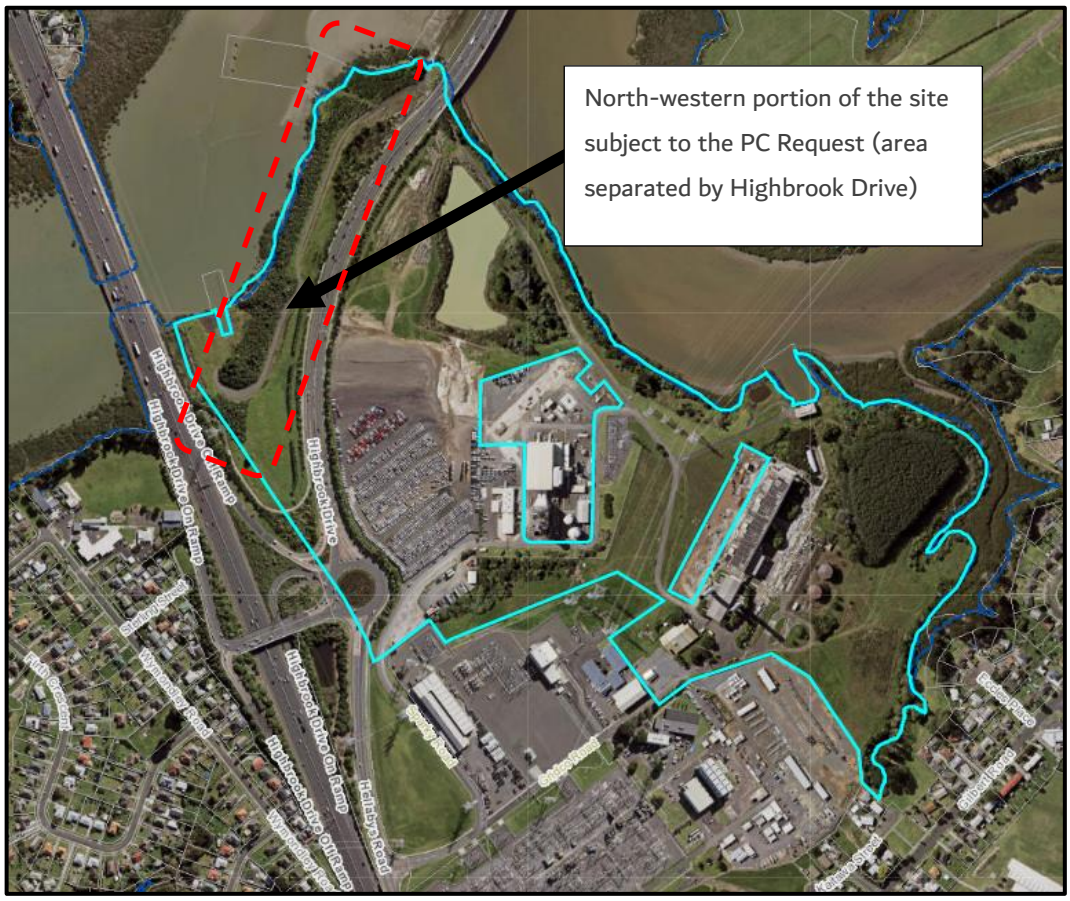
- Technical Report 1: Economic Overview Report, prepared by Property Economics
- Technical Report 2: Integrated Transport Assessment, prepared by Stantec
- Technical Report 3: Geotechnical Appraisal Report, prepared by Babbage
- Technical Report 4: Assessment of Landscape and Visual Effects Report, prepared by LA4
- Technical Report 5: Land Contamination Review, prepared by Babbage
- Technical Report 6: Ecological Assessment, prepared by Bioresearchers
- Technical Report 7: Urban Design Statement, prepared by ET Urban Design Ltd
- Technical Report 8: Infrastructure Report, prepared by Babbage
- Technical Report 9: Stormwater Management Plan, prepared by Babbage
- Technical Report 10: Ngāti Tamaoho Highbrook Plan Change Cultural Values Assessment.

2.9 A section 32 evaluation has been completed, and it concludes that the PC Request will more effectively and efficiently achieve the objectives of the AUP(OP), and the purpose of the RMA, than the current provisions sought to be amended. The statutory assessment (including the section 32 evaluation) set out in this Planning Report will continue to be refined as the PC Request progresses through the various processing stages.

3 BACKGROUND

3.1 The PC area is approximately 4ha, forming part of the larger site located at 8 Sparky Road, Ōtara (refer Figure 3-1). The full site at 8 Sparky Road is approximately 35ha in area.

***Figure 3-1**: Site at 8 Sparky Road, Otara (Source: Auckland Council Geomaps Aerial Photography 2017)*



3.2 Prior to the construction of Highbrook Drive, the site at 8 Sparky Road operated as a single large site, being the location of the former Ōtāhuhu Power Station (refer Figure 3-2). The Ōtāhuhu Power Station was a natural gas-fired power station commissioned in 1968 and was first owned by the New Zealand Electricity Department, then the Electricity Corporation of New Zealand, followed by Contact Energy who took over the

facility in 1996. The facility consisted of two stations known as Ōtāhuhu A (located on the eastern portion of the site) and Ōtāhuhu B (located on the western portion of the site).

***Figure 3-2**: Ōtāhuhu Power Station Site in 2001 (Source: Auckland Council Geomaps Aerial Photography 2001)*

3.3 Figure 3-3 contains photos of Ōtāhuhu Power Station buildings.

***Figure 3-3**: Photos of Ōtāhuhu Power Station*

3.4 The construction of Highbrook Drive in 2007, split the Ōtāhuhu Power Station site into two portions: the area west of Highbrook Drive and the area east of Highbrook Drive (refer Figure 3-4). An underpass vehicle access was constructed below Highbrook Drive to provide a direct link between the two portions of the site, to enable the Ōtāhuhu Power Station facility to continue to operate as a single site.

***Figure 3-4**: Construction of Highbrook Drive (Source: Auckland Council Geomaps Aerial Photography 2006)*

3.5 Contact Energy closed the Ōtāhuhu Power Station in September 2015, and subsequently sold the entire site in 2016. As the Ōtāhuhu Power Station was gas-fired power, Contact Energy's decision to close it reflected the growth in renewable electricity generation at the time. Since 2016, the infrastructure on the site continue to be dismantled.

3.6 A Record of Title for the full site at 8 Sparky Road is included in Appendix 1. It sets out a number of interests recorded on the Record of Title NA137B/367. In November 2000, a Deed of Arrangement was signed between Contact Energy Limited and the former Manukau City Council in which Contact Energy agreed to support the then proposed Notice of Requirement for Highbrook Drive. Subsequently in 2004, an Agreement for Sale of Land for Road and Compensation was agreed between Manukau City Council and Contact Energy Limited. One of the matters agreed was to survey the Ōtāhuhu Power Station site to identify the interests to be recorded on the Record of Title, and survey

the area of the proposed Highbrook Drive route. Highbrook Drive was subsequently constructed in 2007.

3.7 In accordance with the above agreement, a Survey Plan SO 403357 was approved by Land Information New Zealand ("**LINZ**") in 2014. A copy of Survey Plan SO 403357 is included in Appendix 1, and in brief, it identifies:

- Land to be acquired for public road
- Severance lots
- Land to be acquired for motorway purposes
- Easements for various services (water, wastewater, stormwater etc)

3.8 While the Survey Plan SO 403357 was approved by LINZ, the final step to legalise the land for Highbrook Drive has not yet been completed (i.e. the land has not been vested into AT).

3.9 In light of the above, Designation 6714 for SH1 remains on the PC area. Waka Kotahi NZ Transport Agency ("**Waka Kotahi**") has provided written confirmation that it supports in principle uplifting of Designation 6701 subject to legalisation of Survey Plan SO 403357, and noting that some parts of Designation 6701 may remain in the proximity of the Highbrook Drive/SH1 interchange.

4 THE PLAN CHANGE REQUEST

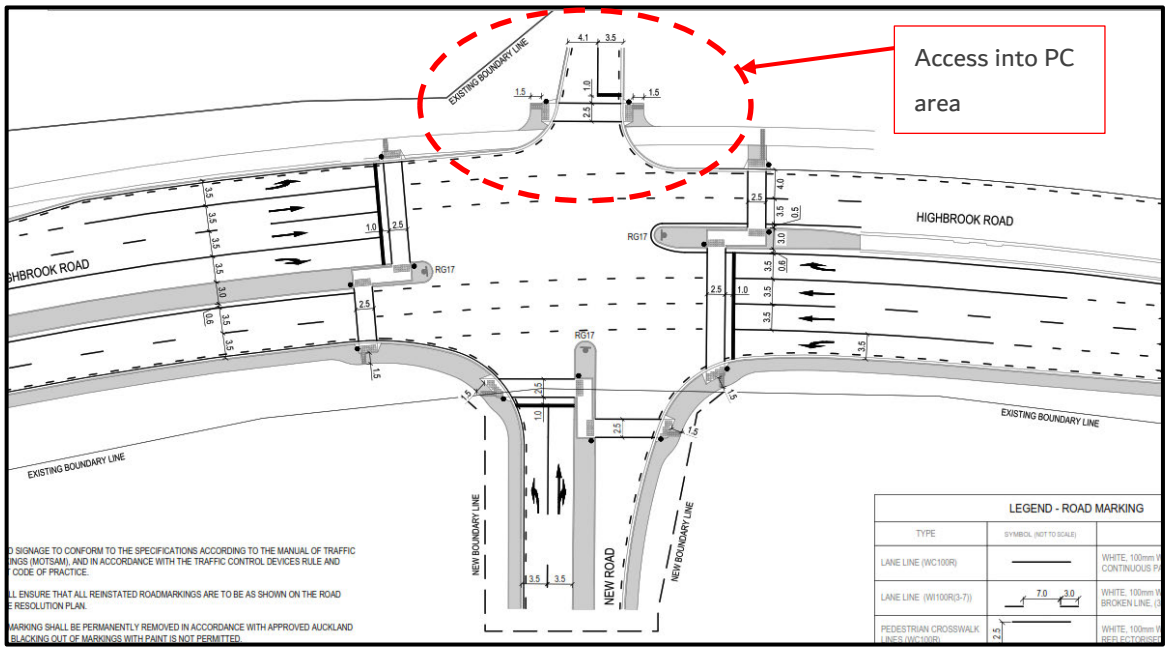
The necessity for the Plan Change Request

4.1 The entire site at 8 Sparky Road is being developed by Euroclass Design and Build ("Euroclass"). Euroclass has significant experience (over 30 years) in developing industrial, commercial and residential developments, and has completed over 300 projects across New Zealand. Euroclass' strategic design and build approach has produced high quality outcomes, an example being Stonehill Business Park in Wiri, Auckland.

4.2 In line with the expectations of the Light Industry zone, Euroclass investigated the potential development of the entire site at 8 Sparky Road for industrial purposes. Market research by Euroclass showed that consistent with the existing businesses in the Light Industry zoned land in proximity to the site at 8 Sparky Road, which consists of logistics services and storage/distribution; market demand is for larger spaces to accommodate large scale industrial development.

4.3 In order to enable the use of the site at 8 Sparky Road for industrial purposes, the first step was to establish a signalised vehicle access into the site from Highbrook Drive (providing access both into the PC area and the remainder of the 8 Sparky Road site). In February 2020, Auckland Council approved a new signalised intersection at Highbrook Drive, located approximately 500m north of the Highbrook Drive/SH1 roundabout (refer Figure 4-1). Careful consideration was given to the location of the access. The new access had to be located sufficiently south of the Ōtara Creek bridge so that any localised road widening on approach to the intersection could be accommodated without any changes required along the bridge section and as far away from the Highbrook Drive/SH1 roundabout as possible to maximise the distance between the intersections to avoid queuing and maintain safe operation of SH1.

***Figure 4-1**: Approved engineering design for vehicle access for 8 Sparky Road from Highbrook Drive.*



4.4 The next step was to consider the internal road layout and the location of potential building footprints within the PC area, in light of the constraint posed by the location of the approved vehicle access. Based on Euroclass' extensive industrial development experience, and investigations into the internal road layout and potential building footprint locations, it was concluded that the PC area is not suitable for its intended use under the Light Industry Zone, for the following reasons (refer Figure 4-2):

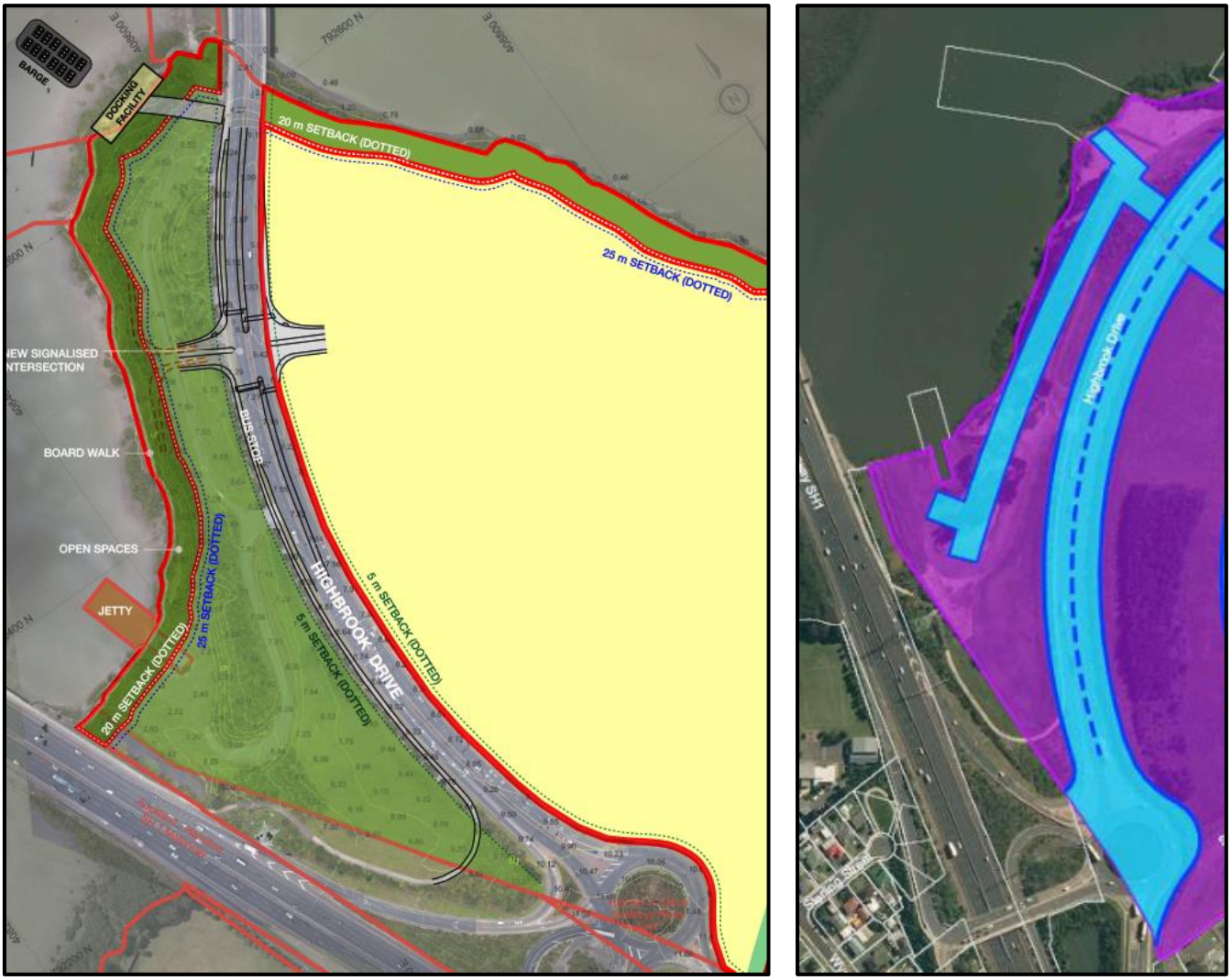
- The long and narrow shape of the PC area presents significant challenges for site design for use as industrial development. The approved vehicle access is located at the narrowest part of the PC area, thereby making it impractical to design for turning circles required for industrial vehicles, such as semitrailers.
- The approved vehicle access results in the PC area being divided into two parts: area north of the approved vehicle access, and the area south of the approved vehicle access. This division of the PC area into two parts, makes it impracticable to design for large industrial buildings footprints.

- The site design and potential building layout must consider the future esplanade areas to be vested into Council at the subdivision stage. Noting the long narrow shape of the PC area, the area available for development between Highbrook Drive and future esplanade areas is further reduced along the full length of the PC area.
- In order to service the area below the approved vehicle accessway, a road of an appropriate width is required to enable trucks to service building platforms potentially located within the southern portion of the PC area (adjoining SH1). This road will need to be located parallel to Highbrook Drive. In conjunction with the future esplanade reserve areas, the new internal road will further reduce the developable areas available within the PC area.
- The Integrated Traffic Assessment Report (attached as Technical Report 2) states that Highbrook Drive and associated parts of the network are congested under the baseline modelling scenario. This is a concern that has been raised by AT and Waka Kotahi in the consultation meetings. In light of this concern, careful consideration must be given to the type of land uses feasible within the PC area. Smaller scale industrial, commercial, office or retail type of activities that individually or cumulatively are deemed to be high traffic generating activities present a significant constraint for development within the PC area. The PC area is a relatively isolated site, located between SH1, Highbrook Drive and Tāmaki River and is separated from the other Light Industry zoned land within Highbrook. As evident in current developments occurring in Highbrook, demand is for larger industrial buildings. Small scale industrial, office, food and retail type of activities are more appropriately located in Highbrook Crossing, forming the hub of the Highbrook Business Park noting its strategic location. The isolated nature of the PC area makes it less desirable for small scale activities, and increases uncertainties in respect of the future viability of these land uses.
- In light of above, it is concluded that the Light Industry zoning of PC area does not enable the efficient use of this important land resource.

4.5 For the reasons set out above, it is concluded that the PC area is not suitable for its intended use under the Light Industry Zone. The objectives and policies framework of

the Light Industry Zone make it clear in that activities that do not support the primary function of the zone are avoided (Objective H17.2(2) and Policy H17.3(3)). In this context, a PC to rezone the subject area is necessary to apply a more appropriate zoning that enables an efficient use of this land resource located in a strategic location, while avoiding, remedying or mitigating any adverse effects on the environment.

***Figure 4-2**: Constraints posed by the future esplanade reserve areas, approved vehicle access and potential future internal roading layout.*



The vision for the Plan Change area

4.6 The section 32 assessment concludes that the application of the THAB Zone will more effectively and efficiently achieve the objectives of the AUP(OP), and the purpose of the RMA. In order to inform the PC preparation process, Maria Ouzounova (Principal Architect, Babbage) has prepared the Highbrook Living Development Concept Plan ("Concept Plan") set out in Figure 4-3 below.

***Figure 4-3**: Highbrook Living Development Concept Plan*

4.7 The purpose of the Concept Plan is to:

- Articulate the high-level vision and key design principles (as set out in Technical Report 7 – Urban Design Statement) for the future development of the PC area based on the opportunities and constraints presented by the PC area, the local context, and the wider environment in which the PC area is located within.
- Noting the long and narrow shape of the PC area, and the need to consider the future esplanade reserve areas, the Concept Plan includes the locations of the

future building platforms to illustrate that it is feasible to develop the PC area for residential development.

- Identify the development potential of the PC area (i.e. number of household units) to inform the ITA; and water, wastewater and stormwater infrastructure servicing.

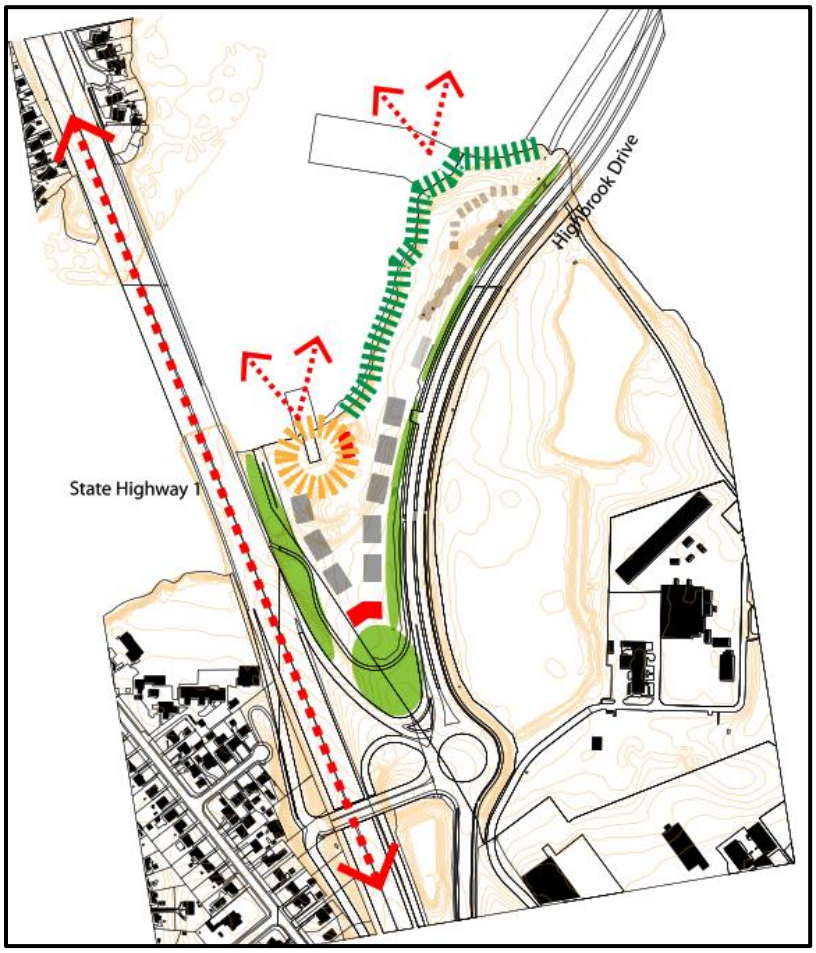
4.8 The PC Request does not seek to incorporate the Concept Plan into the proposed Highbrook Precinct, as the PC relies on the implementation of the THAB Zone provisions in the AUP(OP) to implement the development vision for the PC area. It is noted that the Concept Plan at this stage represents a high-level vision for the PC area and will be refined through the subsequent detailed design process.

4.9 The high-level vision and design principles for the PC area are articulated in the Urban Design Statement (attached as Technical Report 7). In brief, these are (refer Figure 4-4):

- Create a vibrant residential neighbourhood, within an attractive landscape setting.
- The PC area benefits from an extensive Tāmaki River frontage and a northern aspect. Access to and enjoyment of the Tāmaki River frontage is a key element of the design approach.
- The opportunity to develop the site for residential purposes, using a finer grained development response, that affords access to the Tāmaki River frontage, and creates opportunities for enhancement and stewardship of the Tāmaki River environments.
- Use existing site features and topography to inform the overall site development and layout based on an enclosure, human scale and views. Intensity of development at the widest part of the PC area, with a diminishing scale and intensity to the north.
- Create a community focal point by integrating public open space areas and small-scale activities (such as a café) adjoining the esplanade reserve areas, in the southern portion the PC area.

- Utilise the existing Tāmaki River edge and vegetation as a means of connecting the open spaces, resulting in an ecological and recreational network of open spaces across the PC area.
- Provide a legible structure that capitalises on views and focal points. Complementing the formal designed spaces, the proposed design should identify key locations within the layout for focal point buildings. These buildings will be important opportunities to support the key spatial elements of the overall plan and act as local markers to more distant views.

***Figure 4-4**: Overall design concept*



The purpose and reasons for the Plan Change Request

4.10 The purpose of this PC Request is to enable the use and development of the PC area for high density residential development, via the THAB Zone provisions in the AUP(OP).

4.11 The reasons for the PC Request are:

- For the reasons set out in sections 4.1 to 4.5 of this Planning Report, the rezoning of the PC area is necessary as the PC area is not suitable for its intended use under the Light Industry Zone.
- The rezoning of the PC area is necessary as a resource consent application to establish residential development is not likely to be approved, as it would be contradictory to the objectives and policies framework of the Light Industry Zone, which seeks to ensure that activities that do not support the primary function of the Light Industry Zone are avoided.
- The PC area is located within the Rural Urban Boundary ("**RUB**"), and is infrastructure ready for residential development.
- The PC seeks to use the existing site features, topography and extensive Tāmaki River frontage and northern aspect to create a vibrant residential neighbourhood, set within an attractive landscape setting, while maximising the efficient use of this land for residential development.
- The appropriateness of the use of the PC area for residential purposes is confirmed by the multiple specialist assessments supporting the PC Request.
- The Auckland Plan 2050 states that Auckland requires another 320,000 dwellings by 2050, and the current levels of construction fall well below the demand. In this regard, the PC area is a large block of land (approximately 4ha), strategically located, is "infrastructure ready", able to be developed in line with THAB Zone provisions, to deliver a range of housing sizes of a high quality, and is able to be delivered within reasonable timeframes.

The Proposal

4.12 The purpose of this PC Request is to enable the use and development of the PC area for high density residential development, via the THAB Zone provisions in the AUP(OP).

4.13 The proposal is to:

- Rezone 4.4ha of land from Business - Light Industry Zone to THAB.
- Introduce a new Precinct (Highbrook Precinct) into Chapter I Precincts (South) of the AUP(OP) to implement bespoke provisions (objectives, policies and rules) specially to address two resource management matters:
  a) manage adverse transportation effects on the surrounding road network, in particular Highbrook Drive and the Highbrook Drive/SH1 roundabout.
  b) protect activities sensitive to noise from adverse health and amenity effects rising from road traffic noise associated with the operation of SH1 and Highbrook Drive.
- The Highbrook Precinct introduces the following key provisions:
  a) Limits the number of dwellings within the Highbrook Precinct to 200 dwellings (or dwelling unit equivalents) to ensure that vehicle trip generation from development within the Precinct remains within anticipated levels.
  b) Requires an ITA to be prepared to support a resource consent application for development exceeding 200 dwellings (or dwelling unit equivalents).
  c) A requirement to upgrade the shared pedestrian/cycle pathway adjoining the frontage of the PC area with Highbrook Drive and install pedestrian barrier in a specified location to AT Design Standards.
  d) A requirement to construct a bus stop along the Precinct frontage with Highbrook Drive.
  e) The implementation of a shuttle bus service within the Precinct to provide connections to nearby public transport hubs and town centres.

e) A requirement for buildings containing activities sensitive to noise to be designed and constructed with acoustic attenuation measures to achieve minimum indoor design noise levels.

- The proposal relies on the full suite of overlays, Auckland-wide and THAB Zone provisions to apply within the PC area.

5 THE PLAN CHANGE AREA AND LOCALITY DESCRIPTION

Surrounding Context

5.1 Figure 5-1 illustrates the location of the PC area relative to the surrounding environment.

***Figure 5-1**: Locality Plan*

5.2 The PC area is located within the general proximity of the Waiouru Peninsula area. The local area is characterised by low lying, varied and gently undulating terrain located on the edge of the Tāmaki River/Estuary and Ōtara Creek. Tāmaki River adjoins the north-western boundary of the PC area.

5.3 The PC area is located at the edge of the East Tāmaki / Otara industrial area. The PC area is located approximately 14km south of the Auckland Central Business District and

approximately 16km from the Auckland International Airport. Being in close proximity to SH1, the local area is easy to access. The

5.4 The PC is located beside Highbrook Business Park, a planned 107ha of business park land, incorporating a mixture of commercial, office and supporting retail facilities. Highbrook Business Park also includes Highbrook Park, which consists of 42ha of scenic parkland that winds around the Tāmaki River, and includes 14km of walking and cycling tracks. Pukewairiki Precinct (I435) of the AUP(OP) enables the development of the Highbrook Business Park.

5.5 Pukewairiki (Waiouru) Tuff Ring, an Outstanding Natural Feature (ID 236 in the AUP(OP)), is located to the north-east of the PC area. Schedule 6 Outstanding Nature Features Overlay Schedule in the AUP(OP) describes the Pukewairiki (Waiouru) Tuff Ring as follows:

"Pukewairiki (Waiouru) tuff ring has an indistinct, crater – like depression about 300m in diameter. The crater is breached to the southwest by tidal creeks and has an 8m terrace along the Tāmaki River. It is one of the oldest volcanoes in the Auckland volcanic field."

5.6 The PC area is located approximately 10 to 15-minute drive from the Ōtara Town Centre, Botany Town Centre and Ōtāhuhu Town Centre. Located to the east of the PC area, the Ōtara Town Centre is the closest. The residential area in proximity to the Ōtara Town Centre is a mix of predominantly Mixed Housing Urban ("**MHU**") Zone and THAB Zone. The area contains a mix of social infrastructure, including schools, Te Puke ō Tara Community Centre, Ōtara Pool and Leisure Centre, Ōtara Library and Ngati Ōtara Park. The PC area is also in close proximity to Mount Wellington employment as an employment hub and Sylvia Park development.

5.7 There are also a number of educational facilities in the vicinity of the PC area, including Wymondley Road Primary School, Bairds Mainfreight Primary School and Kindergarden, Sir Edmond Hillary Collegiate Senior School and Manukau Institute of Technology.

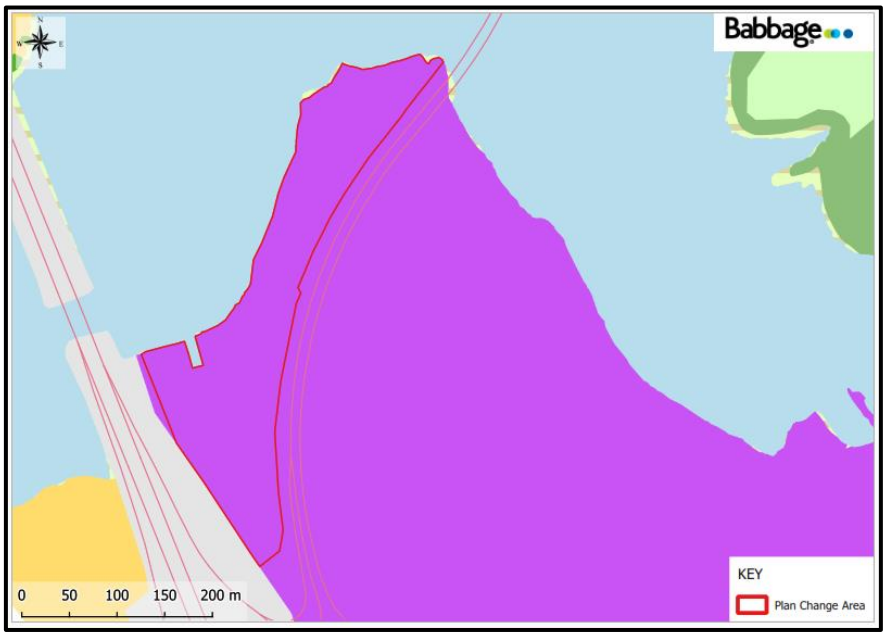
5.8 There are shared pedestrian/cycleway paths provided on both sides of Highbrook Drive in the vicinity of the PC area. The shared path on the northern side of Highbrook Drive connects to an off-road shared path that runs along SH1 to McManus Place to the west of the PC area. To the east, the shared path connects to an off-road shared path that runs along the Tāmaki River. The shared path on the southern side of Highbrook Drive continues thorough the Highbrook Drive interchange roundabout at Hellabys Road.

5.9 Transpower's Ōtāhuhu Substation is located to the south-east of the PC area. It is characterised as an urban landscape dominated by electricity transmission infrastructure, including transmission towers of varying heights, storage yards and transformers. Transpower's Auckland office building is also located on this site.

Plan Change Area Description

5.10 Figure 5-2 illustrates the area subject to the PC Request. The PC area is located within the RUB as identified in the AUP(OP). It is currently zoned Light Industry Zone.

***Figure 5-2**: Area subject to the Plan Change Request*



5.11 Tāmaki River forms the north-western boundary of the PC area. The Light Industry Zone is applied to the PC area up to the Coastal Marine Area ("**CMA**") boundary (i.e the areas forming the riparian margins of the Tāmaki River have not yet been vested in Auckland Council). Tāmaki River forms part of the Hauraki Gulf catchment area, and is identified as a marine degraded area in Auckland (Degraded Area 1).

5.12 Section 1 and Appendix 3 of this report identify the AUP(OP) designations, overlays and controls applying to the PC area. The key provisions include:

- Designation 6714, State Highway 1: To undertake maintenance, operation, use and improvement to the State Highway network.
- National Grid Subdivision Corridor (extends marginally into PC area).
- Coastal Inundation 1 per cent AEP Plus 1m Control - 1m sea level rise.

5.13 Majority of the PC area is relatively flat with an elevation of approximately RL 8m, with the exception of the north-western corner, which is also flat but has an elevation of RL 3m.

5.14 Figure 5-3 illustrates the extent of the PC area within the context of the Ōtāhuhu Power Station facilities operating on the site in 2001. With frontage to Tāmaki River environments, the PC area enabled access to the Ōtāhuhu Power Station facilities using Tāmaki River. Hence the PC area and the adjoining Tāmaki River environments contain remnant infrastructure which previously supported the operation of the Ōtāhuhu Power Station. These are illustrated in Figure 5-4.

***Figure 5-3**: Plan Change area within the context of the Ōtāhuhu Power Station facilities in 2001*

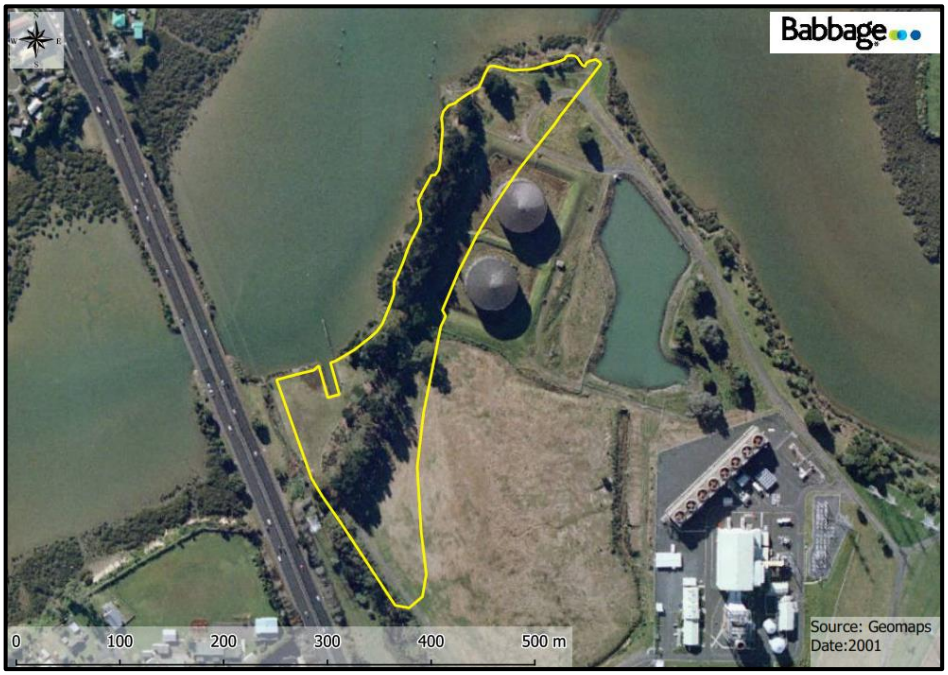
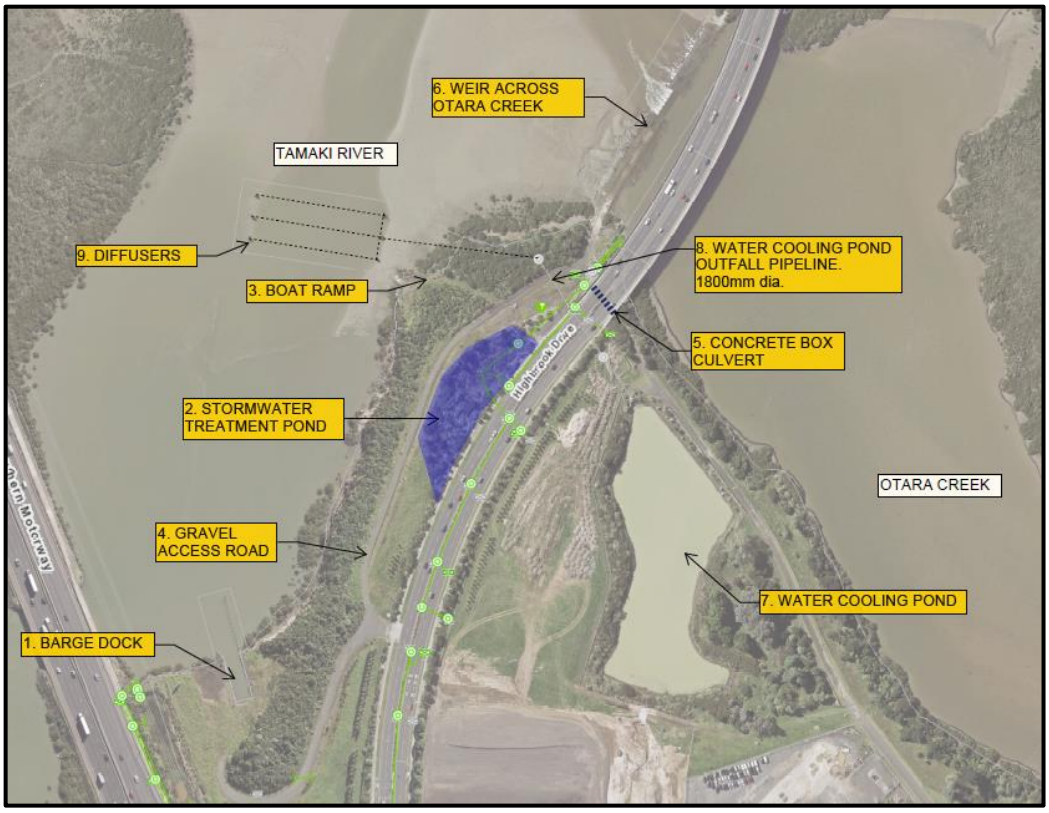


***Figure 5-4**: Infrastructure and other features within the PC area and the adjoining Tāmaki River and Ōtara Creek environments*



5.15 Figure 5-4 illustrates the key features and remnant infrastructure present within the PC area and the adjoining Tāmaki River and Ōtara Creek environments. These are:

1. Barge dock: this was constructed in the 1960s to allow equipment and materials for the Ōtāhuhu Power Station to be brought in via barge. The barge dock consisted of 13 wooden piles spaced at 3m intervals, and a docking bay which is approximately 10m wide and 25m deep. The entry to the docking bay contains two 5m sheet metal walls.
2. Stormwater treatment pond: to treat stormwater runoff generated by approximately 0.9ha of Highbrook Drive.
3. Boat ramp.
4. Gravel access road generally along the full length of the PC area.
5. Concrete box culvert (underpass): measuring about 4m x 2.4m, this is located below Highbrook Drive at the northern tip of the PC area. It enables vehicle access between the east and west sides of Highbrook Drive. At present, this access has been blocked with a fence and a gate for security purposes.
6. A Weir across Ōtara Creek, was constructed in 1968 to provide permanent supply of cooling water for the Ōtāhuhu Power Station. Otara Lake was formed as a consequence of the construction of the weir.
7. Water cooling pond: the pond is located on the eastern side of Highbrook Drive. It was used to cool hot water discharged from the Ōtāhuhu Power Station before being discharged into Tāmaki River. This pond has been partly backfilled, and presently used as a sediment control pond.
8. 1800mm diameter outfall pipeline between the water cooling pond and the Tāmaki River, in the northern portion of the PC area.
9. Diffusers: the outfall pipeline discharges into Tāmaki River via three lines of diffusers identified by the markers in the River.

5.16 Majority of the site is grassed or has low height planting. The vegetation on the site is currently a mix of rank grass, native plantings (flax, five finger, pōhutukawa, pūriri,

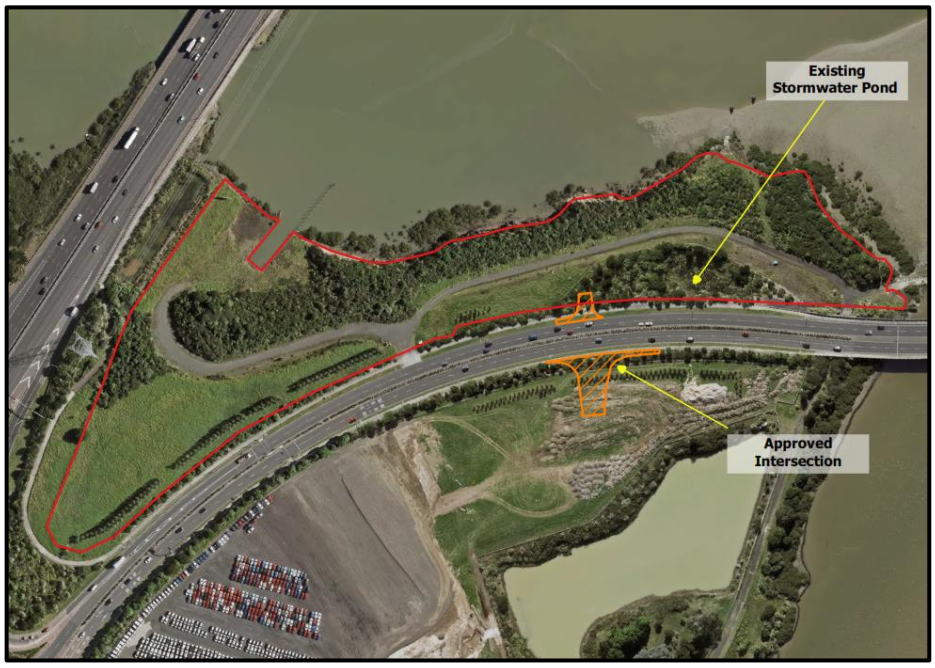
cabbage tree, karo, black matipo, shining karamū, kānuka), exotic trees (macrocarpa, poplar, pine) and exotic weed species (tree privet, pampas, wattle, gorse, woolly nightshade), transitioning to mangroves in the CMA. Although the area of native plantings near the coast are now well established, they are comprised of common native species, and area strongly influenced by weed species.

5.17 SH1 forms the south-western boundary of the PC area. SH1 provides access to key centres, and plays and important through connection through the region as well as direct connection to the surrounding Highbrook area. The PC area connects to SH1 at the SH1/Highbrook Drive roundabout (Highbrook on-ramp) which is located on the south-western corner of the PC area.

5.18 Highbrook Drive forms the eastern boundary of the PC area. It is classified as an arterial route and runs between Allens Road and Hellabys Road, providing access to SH1 and the East Tāmaki and Botany area.

5.19 The PC area will be accessed via a new signalised intersection on Highbrook Drive which is currently being constructed (refer Figure 5-5).

***Figure 5-5**: Access into the PC area*

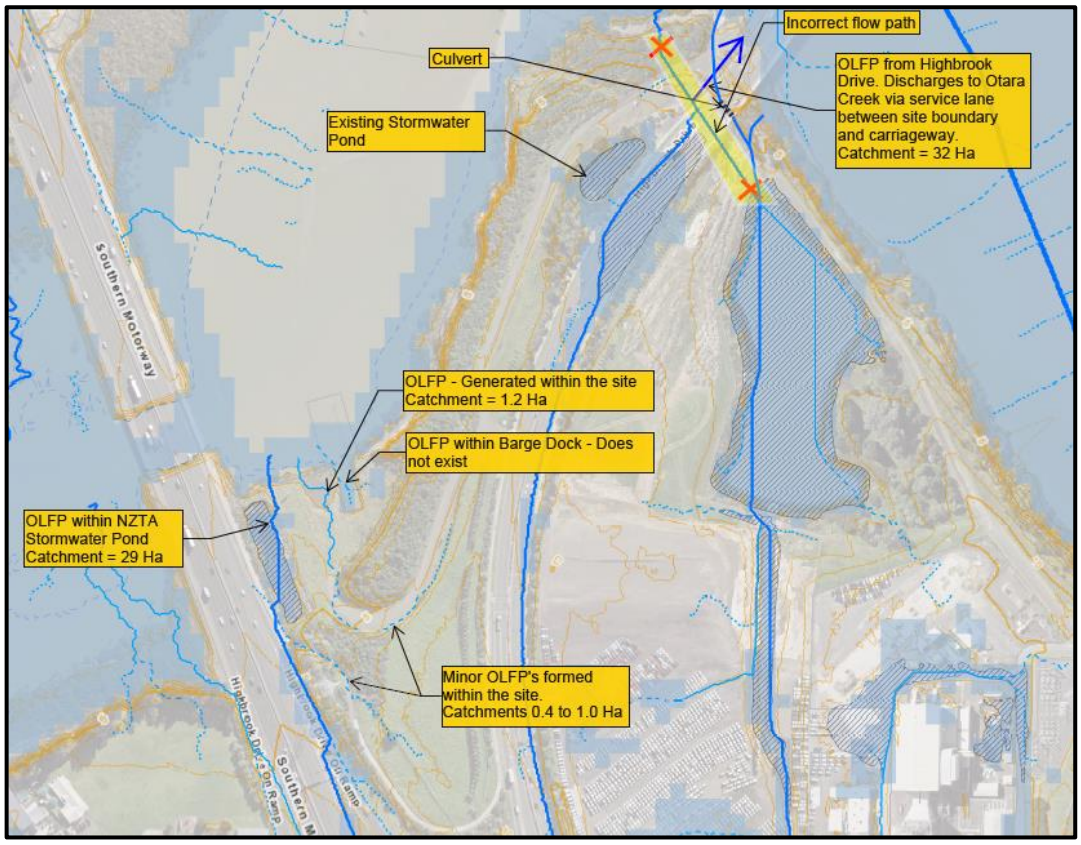


5.20 Auckland Council Geomaps, based on rapid flood modelling, identifies three overland flow paths through the site. Site inspection has confirmed that there are no overland flow paths entering the site from neighbouring land. There are two overland flow paths that start within the site:

- The overland flow path along the table drains off the gravel road.
- The overland flow path in the southern part of the PC area that drains into Waka Kotahi's stormwater pond adjoining SH1.

5.21 Figure 5-6 illustrates the overland flow paths within the PC area. There are no wetlands or streams located within the PC area.

***Figure 5-6**: Overland flow paths within the PC area*



5.22 National Grid infrastructure (overhead transmission lines and towers) are located, along SH1 boundary, but outside the PC area. The mapped extent of the National Grid Yard

(Uncompromised) in the AUP(OP) is located outside the PC area. The mapped extent of the National Grid Subdivision Corridor extends minutely into the PC area, in the proximity of the Waka Kotahi stormwater pond area.

6 SECTION 32 EVALUATION

6.1 Clause 22(1) of Schedule 1 of the RMA states that plan change request must contain an evaluation report prepared in accordance with section 32 of the RMA. In brief, section 32 requires that the evaluation report must:

- Examine the extent to which the *objectives* of the *proposal* being evaluated are the most appropriate way to achieve the purpose of the Act; and
- Examine whether the provisions in the proposal are the most appropriate way to achieve the objectives, by: identifying other reasonably practicable options, assessing the efficiency and effectives of the provisions; and summarising the reason for deciding on the provisions; and
- Contain a level of detail that corresponds to the scale and significance of the effects that are anticipated from the implementation of the proposal.

6.2 In this context:

- The "proposal" means to rezone the PC area from Light Industry Zone to THAB Zone and apply the proposed Highbrook Precinct.
- The "objectives" of the proposal refers to the purpose of the proposal, which is to enable the use and development of the PC area for high density residential development, to create a vibrant residential community set within an attractive landscape setting provided by the Tāmaki River environments and in close proximity to a major employment hub.
- The "provisions" refer to the changes to the zoning of the PC area and the proposed Highbrook Precinct.

6.3 The primary matters considered in this section 32 assessment are:

- The extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of the RMA?
- What is the most appropriate zoning for the PC area in terms of the requirements of the section 32?

The extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of the RMA?

6.4 The objective of the proposal is to enable the efficient use of land within the PC area for high density residential development, to create a vibrant residential community set within an attractive landscape setting provided by the Tāmaki River environments. It is considered that the adoption of the THAB Zone provisions, together with the proposed Highbrook Precinct, is the most appropriate way to achieve the purpose of the RMA.

6.5 Part 2 of the RMA sets out the Act's purpose and principles in sections 5 to 8. The overriding purpose of the RMA is to promote the sustainable management of natural and physical resources. The operative provisions of the THAB Zone have already been assessed as part of the development of the AUP, to be consistent with the purpose and Part 2 of the RMA. Auckland Council has notified plan changes to respond to the NPS-UD and the requirements of the RMA, which include proposed amendments to the THAB Zone provisions. The Council has undertaken a comprehensive assessment under section 32 and have concluded that the proposed amendments are the most appropriate way to achieve the purpose of the RMA.

6.6 Overall, it is concluded that the objective of the proposal (being to rezone the PC area for residential use), provides for the social, economic and cultural well-being of the community by increasing the supply of housing in Auckland, while avoiding, remedying and mitigating any adverse effects on the environment.

What is the most appropriate zoning for the PC area in terms of the requirements of the section 32?

6.7 In determining the most appropriate way to achieve the objective of the proposal, options were developed to explore the most appropriate zoning for the PC area, and

achieve the sustainable purpose of the RMA. The following reasonable options were explored:

- Option 1: Status quo / Do nothing (i.e. retain the Light Industry Zone)
- Option 2: Rezone to Mixed Housing Urban Zone
- Option 3: Rezone to THAB Zone and include a new Highbrook Precinct (preferred option)

6.8 Based on the section 32 evaluation of the three options set out below, it is concluded that Option 3, rezoning to THAB Zone is the most appropriate zone for the PC area, subject to the implementation of the Highbrook Precinct, and is the most appropriate, efficient and effective in achieving the objectives of the proposal.

Option 1: Status quo / Do nothing (i.e. retain the Light Industry Zone)

Cost (including environmental, social, economic and cultural effects)
• Due to the isolated nature of the PC area and its long and narrow shape, the PC area presents significant challenges for site layout design for use for industrial development purposes. As the PC area is not suitable for its intended use under the Light Industry Zone, it creates a high level of uncertainty as to its future use and development. The PC area shape factor and constraints on the site, will result in an inefficient use of an important land resource. • Any future changes in land uses will incur additional financial costs associated with the resource consent approval process. The resource consent applications will need to be assessed on a case by case basis, and must be consistent with the objectives and policies of the Light Industry Zone. The objectives and policies framework of the Light Industry Zone is clear in that activities that do not support the primary function of the zone are avoided. As such, there is no certainty that a resource

consent application to seek an alternative land use will be approved. The resource consent process will cumbersome, time expensive, and financially expensive. • Public access to any future coastal esplanade areas vested as part of the future subdivision process may be delayed due to the uncertainty around industrial feasibility. • Industrial development is expected to underutilise the amenity associated with the coastal environment. • Potential for new industrial activities to release contaminants into environment and reduce quality of land, water and air. This may adversely affect local community, and create costs associated with mitigation of risk or remediation.
Benefits (including environmental, economic, social and cultural effects)
• Avoids the need for a private plan change process, and the associated time and financial costs associated with the process. • Construction of industrial buildings and establishing industrial activities in the Light Industry Zone area a permitted activity. This would result in lower land development costs associated with the resource consenting process. • The current zoning provides opportunities for industrial development aligning with the Light Industry Zone in the Ōtara and Highbrook Business Park. This increases potential for agglomeration benefits associated with existing and future industrial activities in the local area. • The PC area benefits from its location near SH1. The Light Industry Zone provides for manufacturing, production, logistics, storage, transport and distribution activities that create goods and services, employment and economic growth.
Extent to which the option is the most appropriate way to achieve the purpose of the RMA and is in accordance with Part 2 of the Act.
The Light Industry Zone has undergone a section 32 assessment as part of the AUP development process. Therefore, the objectives and policies have already been concluded to be consistent with the purpose and Part 2 of the RMA.

Extent to which the option is the most appropriate, efficient and effective in achieving the objectives of the proposal.
The "do nothing" option does not address the identified issue, nor does it achieve the purpose of this proposal. Under this option, the PC area and the Light Industry Zone would not achieve the efficient use and development and land.
Risk (assessment of the risk of acting or not acting if there is uncertain or insufficient information about the provisions)
It is considered that there is sufficient information available on which to consider the proposal. No identifiable risks have been identified.

Option 2: Rezone to Mixed Housing Urban Zone

Cost (including environmental, social, economic and cultural effects)
• A private plan change process is complex and rigorous, requiring public notification and consultation. The cost of this option being time and money. • Costs associated with the resource consenting application process, as it is more complex generally when compared to a typical large scale warehouse storage type of industrial development. • Costs to construct infrastructure to service the residential development. • May give rise to perceived reverse sensitivity effects due to the PC area being located beside the Light Industry Zone land. • The additional costs associated with acoustic attenuation of buildings with activities sensitive to noise being located in close proximity to SH1 and Highbrook Drive. • The PC area is of a significant size to enable comprehensive design and layout, to facilitate more intensive development by "building up" and retaining more open

space areas available for use by the local community. The MHU Zone forgoes this opportunity by anticipating a built form that is generally up to three storeys.
Benefits (including environmental, economic, social and cultural effects)
• Enables opportunity to develop the site for residential purposes, using a finer grained development response, that affords access to the Tāmaki River frontage, and creates opportunities for enhancement and stewardship of the Tāmaki River environments. • Enables opportunity to use existing site features and topography to inform the overall site development and layout based on an enclosure, human scale and views. • Will accommodate a range of housing types, e.g. detached, terraced houses, and apartments to meet the demand for existing and future housing choices of Aucklanders. • Contribute a significant number of residential units to Auckland's housing supply to accommodate the city's growth pressures. • Locating new housing within the city's urban area reduces pressure to accommodate future growth via urban sprawl and the potential loss of natural resources. • Location benefits relating to proximity coast/open space, employment area and SH1. Residential use will result in greater utilisation of amenity and recreational values associated the coastal environment, including the future coastal esplanade. Values are utilised by residents and their visitors through outlook from dwellings and access to the coast. Residential development is compatible with the amenity of any future coastal esplanade areas. • Efficiencies result from locating between three metropolitan centres, Sylvia Park, Botany and Manukau, being adjacent to significant industrial sector employment opportunities, and direct access to SH1. • The introduction of a residential activity will require a new bus stop connection along Highbrook Drive and will encourage public transport usage.

• Esplanade reserve areas to be vested as part of the future residential subdivision is expected to contribute to natural character of the Tāmaki River edge.
Extent to which the option is the most appropriate way to achieve the purpose of the RMA and is in accordance with Part 2 of the Act.
The operative provisions of the MHU Zone have been assessed as part of the development of the AUP, to be consistent with the purpose and Part 2 of the RMA. Auckland Council has notified plan changes to respond to the NPS-UD and the requirements of the RMA, which include proposed amendments to the MHU Zone provisions. The Council has undertaken a comprehensive assessment under section 32 and have concluded that the proposed amendments are the most appropriate way to achieve the purpose of the RMA.
Extent to which the option is the most appropriate, efficient and effective in achieving the objectives of the proposal.
While this option directly addresses the identified issue and objective of the proposal, it addresses them to a lesser extent compared to THAB Zone (preferred option). This is due to the latter providing greater density of housing development than the MHU Zone. Due to the constraints posed by the shape factor of the PC area, to enable comprehensive development of the PC area, it is desirable to facilitate more intensive development by "building up" and retaining more open space areas available for use by the local community. The MHU Zone forgoes this opportunity, and will result in less efficient use of the PC area than the THAB Zone.
Risk (assessment of the risk of acting or not acting if there is uncertain or insufficient information about the provisions)
It is considered that there is sufficient information available on which to consider the proposal. No identifiable risks have been identified.

Option 3: Rezone to THAB Zone

Cost (including environmental, social, economic and cultural effects)
• A private plan change process is complex and rigorous, requiring public notification and consultation. The cost of this option being time and money. • Costs associated with the resource consenting application process to establish high density development, as it is more complex generally when compared to typical large scale warehouse storage type of industrial development. • Costs to construct infrastructure to service the residential development. • May give rise to perceived reverse sensitivity effects due to the PC area being located beside the Light Industry Zone land. • The additional costs associated with acoustic attenuation of buildings with activities sensitive to noise being located in close proximity to SH1 and Highbrook Drive.
Benefits (including environmental, economic, social and cultural effects)
• Will accommodate a range of housing types, e.g. detached, terraced houses, and apartments to meet the demand for existing and future housing choices of Aucklanders. • Contribute a significant number of residential units to Auckland's housing supply to accommodate the city's growth pressures. • Locating new housing within the city's urban area reduces, at a micro level, pressure to accommodate future growth via urban sprawl and the potential loss of natural resources. Due to the high densities enabled by the THAB Zone, the above benefits are greater under this option compared to the Mixed Housing Urban Zone (option 2). • Enable opportunity to develop the site for residential purposes, using a finer grained development response, that affords access to the Tāmaki River frontage, and creates opportunities for enhancement and stewardship of the Tāmaki River environments.

• The PC seeks to use the existing site features, topography and extensive Tāmaki River frontage and northern aspect to create a vibrant residential neighbourhood, set within an attractive landscape setting, while maximising the efficient use of this land for residential development. • Location benefits relating to proximity coast/open space, employment area and SH1. Residential use will result in greater utilisation of amenity and recreational values associated the coastal environment, including the future esplanade reserve areas. Values are utilised by residents and their visitors through outlook from dwellings and access to the coast. Residential development is compatible with the amenity of any future coastal esplanade areas. • Efficiencies result from locating between three metropolitan centres, Sylvia Park, Botany and Manukau, being adjacent to significant industrial sector employment opportunities, and direct access to SH1. • The proposed Highbrook Precinct will encourage the use of public transport systems, and provides opportunities for walking and cycling to the local employment areas within Highbrook and Ōtara.
Extent to which the option is the most appropriate way to achieve the purpose of the RMA and is in accordance with Part 2 of the Act.
The operative provisions of the THAB Zone have been assessed as part of the development of the AUP, to be consistent with the purpose and Part 2 of the RMA. Auckland Council has notified plan changes to respond to the NPS-UD and the requirements of the RMA, which include proposed amendments to the THAB Zone provisions. The Council has undertaken a comprehensive assessment under section 32 and have concluded that the proposed amendments are the most appropriate way to achieve the purpose of the RMA.
Extent to which the option is the most appropriate, efficient and effective in achieving the objectives of the proposal.

Option 3 directly addresses the identified issue and objective of the proposal as it enables an urban residential zoning that allows for efficient use of the land. The THAB zoning will contribute to quality compact urban form by enabling higher residential intensification near employment opportunities and future open space (coastal esplanade). The benefits of a greater number of housing and its compatibility with the coastal environment is significant. The rezoning would not materially impact employment and industrial opportunities to meet current and future demands. This is due to the narrow shape of the PC area, which constraints efficient industrial development, and there is sufficient industrial land capacity in the Auckland Region and Auckland South. Given the reasons above, Option 3 is the most appropriate, efficient and effective in achieving the objectives of the proposal.
Risk (assessment of the risk of acting or not acting if there is uncertain or insufficient information about the provisions)
It is considered that there is sufficient information available on which to consider the proposal. No identifiable risks have been identified.

7 ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

7.1 The following assessment of actual and potential effects on the environment is provided in accordance with Clause 22 of Schedule 1 of the RMA. The following sections provide an overview of the findings of the technical reports set out in Appendix 4. The following effects on the environment are relevant to the PC Request:

- Economic matters
- Integrated transport assessment
- Landscape and visual effects
- Urban design
- Reverse sensitivity effects
- Road traffic noise effects
- Ecology
- Infrastructure servicing – water and wastewater
- Stormwater Management Plan
- Geotechnical matters
- Land contamination
- Effects on Mana Whenua

Economic matters

7.2 An Economic Overview Report has been prepared by Phil Osborne of Property Economics. The Economic Overview Report assess the high-level economic grounds for the rezoning of the PC area from Light Industry Zone to THAB Zone.

7.3 With respect to the likely impact of the rezoning of the PC area on the industrial land supply of the broader region and the localised industrial market, the Economic Overview Report states that:

- The core economic market (or catchment) considered most relevant to the PC in terms of light industry activity is referred to as the "Auckland South". It is noted that this identified area does not represent the entire market, as some industrial activities within the PC area may also serve the wider Auckland market (and beyond).
- Based on the Housing and Business Development Capacity Assessment 2017 (Auckland Council), the Auckland Region has the equivalent industrial capacity around 2,993ha, which consists of 2,280ha of Light Industry land and 713ha of Heavy Industry land. Considering the industrial areas proposed by Council's Structure Plans, the total industrial land capacity is estimated at approximately 3,957ha across the region. In contrast to the predicted total industrial land demand around 1,420ha in the region, these estimated capacities are more than sufficient so that the PC would not undermine the industrial performance of the broader region.
- Auckland South is estimated to have around 1,217ha of total equivalent industrial land capacity, with Council's Structure Plans excluded. Of this 1,019ha is identified as Light Industry. This would result in an estimated surplus capacity of 819ha by 2028 and 461ha by 2048 for industrial activities. It is evident that there is more than sufficient industrial capacity in Auckland South.
- Including Structure Plans, the total surplus capacity of Light Industry Zone would be 706ha by 2028 and 645ha by 2048, suggesting that the PC area is not required to accommodate the projected industrial land demand to 2048. In total, the industrial land capacity is estimated to have a surplus of 819ha by 2028 and 706ha by 2048, with the Structure Plans included.
- Having considered the estimated future demand for industrial land, the excess of industrial land capacity is estimated to be approximately 819 ha by 2028 and 461 ha by 2048 (this is excluding areas identified in Structure Plans). It is estimated that all long term Light Industrial demand can be meet within the catchment with a residual (surplus) capacity of 424 hectares of capacity. It is therefore evident

that there is more than sufficient (Heavy and Light) industrial land capacity in Auckland South.

- Given that the PC area is currently vacant and not creating any employment opportunities for the local community, the PC would not undermine existing employment within the area and dampen the holistic performance in Auckland South.

7.4 With respect to the viability of the PC area to be used for industrial activity aligned with the current Light Industry Zone, the Economic Overview Report states that:

- Location and site characteristics are the most critical factors influencing the viability of a zone for industrial activities. These factors have implications regarding "industry fit", demand levels, development costs, and the overall potential for the zone's success.
- The PC area is intrinsically different from the rest of the Light Industry zoned land in its proximity, due to its location and landform. The PC area is separated by Highbrook Drive from the remainder of the Light Industry zoned land, and separated by Tāmaki River. This has resulted in the PC area being very narrow and an isolated piece of land. This particular feature increases uncertainties and extra cost associated with land use and development of the PC area.
- The existing businesses in the surrounding Light Industry zoned land involve logistics services, electricity providers and utility contractors. One common feature among these businesses is their demand for larger space. The PC area has a long and narrow feature (circa 400m long and 35m wide for the majority of its length) restricts its potential to accommodate large scale industrial activities. Due to the current landform and site characteristics the PC area will be unable to allow for an efficient on-site layout and design, especially in relation to manufacturing and warehousing activities.
- The current vacant status of the PC area indicates that the land is not attractive for industrial activities.

7.5 With respect to the suitability of the PC are for THAB Zone, the Economic Overview Report states that:

- The PC area has several notable features as a residential location to maximise land use efficiency. It is located between three Metropolitan Centres (Sylvia Park, Manukau and Botany). It is also located adjacent to significant industrial sector employment opportunities.
- There are existing THAB zoned land near the PC area. This reflects the potential for the PC area to be used for similar residential purposes.
- Due to the isolated nature of the PC area, there is no direct interface between the PC area and the wider industrial area in its proximity. Highbrook Drive acts as a natural buffer to manage any potential reverse sensitivity effects.

7.6 The Economic Overview Report concludes that the PC will not undermine the industrial land sufficiency of the localised catchment and the wider region, while maximising the land use efficiency of the PC area. Furthermore, rezoning the PC area to THAB Zone is considered more appropriate use of the land and leverage the unique locational and characteristics of the site.

Integrated Transport Assessment

7.7 An Integrated Transport Assessment ("**ITA**") has been prepared by Zoe Chen and Alaska Upton-Gill of Stantec to assess the traffic effects of the proposed rezoning and the ability of the surrounding existing and proposed transport network to support the development potential of the PC Request.

7.8 The ITA states that the key transportation issues of importance to the PC area are:

- The existing accessibility to the site to various modes of transportation.
- The ability of the design of the site to encourage a variety of transport modes to and from the site for future residents.

- The ability of the development enabled by the PC to be completely self-sufficient, in that any infrastructure costs required to mitigate the effects of the development will be fully met by the applicant.

7.9 With respect to the existing transportation network, the ITA states that:

- The PC area lies at the confluence of several major roads (including Highbrook Drive, SH1 and Hellabys Road) which provides excellent connectivity to the wider Auckland Region.
- The Highbrook area and its supporting roading network is currently arranged to provide higher levels of service and access by private vehicles due to its historic development of industrial land-use activity and proximity of and accessibility to SH1 and the supporting arterial roads.
- There is currently limited active transportation within the Highbrook area due to the largely industrial land use, and the area is currently serviced by two bus routes accessed via bus stops approximately 2km from the PC area.
- There are shared paths provided on both sides of Highbrook Drive in the vicinity of the PC area. The shared path on the northern side of Highbrook Drive connects to an off-road path that runs along the Tāmaki River. The shared path on the southern side of Highbrook Drive continues through the Highbrook Drive interchange roundabout to Hellabys Road. A footpath runs along Highbrook Drive over bridge which provides access to the western side of SH1 an on-road connections to Otāhuhu Town Centre.
- Vehicle access to the PC area will be via a four-arm signalised intersection (being delivered as part of the industrial development within the balance part of 8 Sparky Road site), which will be located approximately 500m north of the Highbrook Drive interchange roundabout.
- It is evident that from a transportation perspective, the PC area is less than fit for purpose under the current zoning due to the geographical constraints on the site, which make turning circles for industrial vehicles such as semitrailers impractical to design for.

7.10 With respect to the inputs and findings of the traffic modelling, the ITA states that:

- Considerations should be given to the traffic impacts of the PC development in comparison to a baseline scenario in which the site is developed for light industry, as per the current zoning.
- The ITA modelled two scenarios:
  a) Permitted baseline scenario: 18,000m^2 of industrial activity on the western portion (PC area) and 90,000m^2 on the eastern portion of the of the site at 8 Sparky Road.
  b) Development scenario (as enabled by the PC Request): 200 dwellings within the PC area and 90,000m^2 on the eastern portion of the site at 8 Sparky Road.
- On-site parking for residents and visitors will be provided for at a rate that supports urban amenity, efficient use of land and the functional requirements of the residential and supporting retail land uses. The exact number of spaces will be confirmed at the resource consent stage; however, it is anticipated the parking supply will accommodate the expected demand on similar developments in the area, without impacting the surrounding road network.
- The traffic modelling shows that there are no significant differences between the baseline and the proposed development scenario, and while the extensive delays at the site intersection are not acceptable, it shows that this largely reflects existing wider network issues rather than caused by the proposed development that would be enabled by the PC Request.
- In this regard (above) and reflecting on the findings of other planning case law (such as the Landco Mount Wellington case in relation to the Stonefields development) around the responsibility of solving regional transport constraints, the resolution of these issues more properly sits with the transportation authorities rather than the developers.

7.11 The ITA makes the following recommendations to be incorporated into the PC Request:

- This ITA assesses development scale up to approximately 200 dwellings with minor supporting developments, such as a café and convenience stores. Any development beyond this development scale should be supported by further transportation modelling in a revised ITA at the resource consent application stage. This recommendation has been incorporated into the Highbrook Precinct.
- A bus stop be provided along the PC area frontage on Highbrook Drive to provide access to Bus Route 351 that provides regular connection between the PC area and Ōtahuhu on the western end and Botany on the eastern end. This recommendation has been incorporated into the Highbrook Precinct.
- To further support public transport mode share, a shuttle service be included in the future transport plans for the PC area. The shuttle bus will connect the development within the PC area with nearby public transport hubs such as Middlemore and Ōtāhuhu trains stations, Botany and Otara Town Centres. The details of the shuttle service should be arranged in consultation with AT and other stakeholders (potentially the on-site resident community / body corporate or similar) to maximise its efficiency in terms of timing and preferred destination. This will enable decreased trip time to the wider public transport and rapid transport network for longer journeys, in addition to covering the lack of Bus Route 351 on the weekends. This recommendation has been incorporated into the Highbrook Precinct.
- Improvements are made to the pedestrian protections at Highbrook Drive, SH1 and Hellabys Road roundabout, and upgrading of the shared pedestrian/cycle path along the PC area boundary. These recommendations have been incorporated into the Highbrook Precinct.

7.12 The ITA concludes that the PC:

- Will have minimal impact on the surrounding roading network. With the implementation of the recommendations set out in the ITA, the overall transport effects associated with the PC Request are appropriate.

- Will enable a development form and scale that appropriately responds to its location and there is no engineering and transport reason to preclude acceptance of the PC Request.

Landscape and visual effects

7.13 An Assessment of Landscape and Visual Effects Report (hereon referred to as the Landscape Report) has been prepared by Rob Pryor of LA4. The Landscape Report explains that:

"*The assessment of landscape effects takes into consideration physical changes to the landscape as a resource which may give rise to changes to its character and quality and perceived landscape values. Visual effects are a consequence of landscape effects as this is how we mainly perceive effects on landscape values. Landscape and visual effects are therefore inextricably linked and are influenced by the sensitivity of the receiving environment combined with the type and magnitude of change associated with the proposal.*"

The Landscape Report assesses the effects of the PC on the urban landscape and visual amenity, which include: natural character effects, landscape effects, visual amenity effects and construction effects. The findings in respect of each of these elements are set out below.

7.14 *Natural character effects*: the PC area is not high in natural character values (other than the Tāmaki River edge), and has been modified through previous activities. The PC area is component of the wider modified Highbrook industrial activities. Overall, the adverse effects of the PC on the natural character values of the PC area and surrounding area will be low. The future esplanade reserve areas will enhance the natural character values of the Tāmaki River edge.

7.15 *Landscape effects*: there are low landscape values and sensitivity associated with the PC area. The PC area is relatively degraded, a modified environment lacking any significant

landscape values (other than the Tāmaki River edge environment). The PC will change the existing landscape character, however, this is already provided for and anticipated by the current zoning. The development enabled by the THAB Zone would enable a superior level of amenity, albeit an urban, rather than an industrial character, resulting in a positive outcome.

7.16 *Visual amenity effects*: the anticipated level of audience exposure to the PC area is large due to the location of the site beside SH1, surrounding roads and the Tāmaki River. The visual effects of development enabled by the PC were assessed from six representative viewpoints (refer Figure 7-1):

1. Highbrook coastal walkway:
2. Ōtara Creek bridge
3. Highbrook/SH1 interchange roundabout
4. Tāmaki River overbridge
5. Curlew Bay Road
6. Shroffs Bay Beach Reserve

***Figure 7-1**: View point Location Map*

7.17 The findings of the assessment of the visual amenity effects are:

- *Surrounding area*: Viewpoints 4 (Tāmaki River overbridge), 5 (Curlew Bay Road) and 6 (Shroffs Bay Beach Reserve) portray the coastal characteristics of the foreground estuarine Tāmaki River and beyond to the Highbrook Business Park. Prominent in the view is the National Grid infrastructure (electricity substation, pylons and overhead transmission lines). These views are representative of the recreational users of the Tāmaki River coastal foreshore, residents within the north-eastern parts of Ōtāhuhu residential area and pedestrians using Tāmaki River overbridge from McManus Place to Highbrook. From these viewing locations, development enabled by the PC would be viewed in the context of the existing highly modified characteristics of Highbrook Business Park and the adjacent motorway. The degree of intrusion that would result from the PC is therefore limited, in that these built elements are already an established part of the surrounding environment. Development enabled by the PC would be viewed from these viewpoints across the mangrove foreground of the coastal edge. The

development of the PC area will not detract from the existing coastal character of the surrounding landscape and would integrate well into the landscape.

- *Surrounding road network*: Viewpoints 2 (Ōtara Creek bridge), 3 (Highbrook/SH1 interchange roundabout) and 4 (Tāmaki River overbridge) represent views from the road users on the surrounding road network. Although a large audience, the general road users are unlikely to be particularly sensitive to the development of the PC area, as they will have fleeting views of the PC area while moving through the landscape. Overall, the visual effects from the surrounding road network will be low and seen within the context of the prevailing industrial context.
- *Highbrook coastal walkway (View point 1):* this viewpoint is representative of the users of the coastal walkway in the vicinity of the PC area. Development enabled by the PC would be viewed from here across the foreground of the Tāmaki River, and would not detract from the existing coastal character of the surrounding landscape and would integrate well into the landscape. For these recreational viewers the existing outlook would change into an urban view with built development.
- *Wider surrounding area:* more distant view may be gained from the Ōtāhuhu residential area on the western side of SH1 to the west and northwest of the PC area and from distant locations within the surrounding landscape. Views towards the development within the PC area would be highly variable due to the distance, orientation of the view, diversity of elements within the view and screening elements including the motorway infrastructure, buildings, electricity substation and vegetation. Overall, the visual effects would be low to very low and entirely acceptable within the context of the existing and planned future urban development.

7.18 The Landscape Report concludes overall that:

- The development of the PC area as anticipated by the PC will change its current vegetated and undeveloped landscape character. The development anticipated by the PC would be consistent with the envisaged development enabled by the current Light Industry Zone.

- While the PC will result in significant visual change from the PC area's current state to one with urban characteristics, such visual change is anticipated and is in accordance with the key planning initiatives for the area in the AUP(OP) (albeit the current Light Industry Zone anticipates a lower level of amenity than proposed by the PC).
- The PC is considered appropriate in this urban setting from a landscape and visual amenity perspective and would result in a superior outcome than the Light Industry Zone currently applying to the PC area.

Urban design matters

7.19 An Urban Design Statement for the PC area has been completed by Jason Evans of ET Urban Design. As described in the Urban Design Statement, the PC request represents an important opportunity to develop a site to a high standard of urban design. Urban design benefits of the PC request include:

- Establishment of a vibrant residential neighbourhood, within an attractive landscape setting, that results in the supply of additional housing choice. The density of housing enabled by the THAB zone will create the right conditions for the development to make a meaningful contribution to Auckland's housing supply while contributing to the enhancement of the natural environment.
- The PC area benefits from an extensive Tāmaki River frontage and a northern aspect. Access to and enjoyment of the Tāmaki River frontage is a key element of the design approach.
- The opportunity to develop the site for residential purposes, using a finer grained development response, that affords access to the Tāmaki River frontage, and creates opportunities for enhancement planting and stewardship of the Tāmaki River environments.
- Existing site features and topography can be used to inform the overall site development and layout based on an enclosure, human scale and views. Intensity of development at the widest part of the PC area, with a diminishing scale and intensity to the north.

- Opportunities to create a community focal point by integrating public open space areas and small-scale activities (such as a café) adjoining the esplanade reserve areas, in the southern portion the PC area.
- Utilise the existing Tāmaki River edge and vegetation as a means of connecting the open spaces, resulting in an ecological and recreational network of open spaces across the PC area. Residential development would support the open space network by providing passive surveillance opportunities.
- Provide a legible structure that capitalises on views and focal points. Complementing the formal designed spaces, focal point buildings are anticipated to support the key spatial elements of the overall plan and act as local markers to more distant views.

Reverse sensitivity effects

7.20 The PC area is located adjacent to Light Industry Zone on the eastern side of Highbrook Drive. Potential reverse sensitivity effects on the Light Industry Zone arising from the rezoning of the PC to THAB Zone are addressed below.

7.21 Reverse sensitivity effects from rezoning the PC area for residential use on the adjacent Light Industry Zone are considered negligible due to the site's physical context. The PC area is relatively isolated from surrounding land uses due the SH1, Highbrook Drive and Tāmaki River. Highbrook Drive provides approximately 30m separation between the PC area and Light Industry zoned area. This wide road reserve will minimise potential reserve sensitivity effects by separating future residential activities visually from the development within the Light Industry Zone, as well as from any potential emissions produced by industrial activities. Moreover, future residential development will focus towards Tāmaki River to take advantage of the coastal outlook and sunlight access. This orientation, away from the Light Industry Zone area will further limit potential for reverse sensitivity effects.

7.22 Reverse sensitivity effects at the interface of residential and industrial areas typically result from heavy industrial activities that produce objectional odour, dust and noise emissions. Under the AUP(OP), these activities are provided for in the Heavy Industry Zone rather than the Light Industry Zone. The Light Industry Zone anticipates industrial activities that do not produce objectionable odour, dust or noise. This is supported by the policies and rules managing air quality and noise emissions in chapters E14 Air Quality and E25 Noise and Vibration of the AUP(OP) which place greater limits on activities in the Light Industry Zone compared to the Heavy Industry Zone.

7.23 In terms of the adjacent Light Industry Zone area, existing industrial activities along the eastern side of Highbrook Drive are generally of a storage and distribution type of activities. Based on the industrial activities in the wider area, there is a significant demand in the locality for large sites that can be used for warehousing, storage and distribution activities. The risk of reverse sensitivity effects on warehousing, storage and distribution activities is low as they produce limited objectional emissions compared to heavy industrial activities. The residential activities enabled by the PC Request are not likely to generate reverse sensitivity effects on the surrounding Light Industry zoned land.

7.24 The objective and policy framework under the AUP(OP) appropriately manages adverse reverse sensitivity effects from urban intensification on existing industrial activities. In particular, Chapter B2 (Urban Growth and Form) of the RPS seeks to manage adverse reverse sensitivity effects on industrial activities, including by preventing inappropriate activities intensifying adjacent to heavy industrial zones. As discussed above, the PC is considered compatible with the existing adjacent Light Industry Zone to the east and therefore is consistent with Chapter B2.

Overall, it is considered that the AUP(OP) provisions provide a strong policy and consenting framework that adequately manages reverse sensitivity effects on Light Industry zoned land.

Road traffic noise effects

7.25 Waka Kotahi and AT have requested that the Highbrook Precinct include a noise attenuation requirement for buildings containing activities sensitive to noise within the PC area, noting that PC area adjoins SH1 and Highbrook Drive. The applicant agrees to the request.

7.26 The effects of road traffic noise were recently considered in Plan Change 51 Drury 2 Precinct ("**PC51**") to the AUP(OP) which became operative in August 2022. Waka Kotahi sought the inclusion of a noise attenuation standard in the Drury 2 Precinct, as it adjoins SH22.

7.27 Waka Kotahi's position was informed by the evidence of Dr Stephen Chiles, a noise and vibration specialist. Dr Chiles' evidence:

- Stated that the adverse health effects due to sound and vibration from road traffic have been well documented by authoritative bodies such as the World Health Organisation ("**WHO**"). One such example is the publication by WHO Europe in October 2018 ("**2018 WHO Guidelines**") which set out guidelines for managing environmental noise.
- Referred to the 2018 WHO Guidelines which noted the following adverse health effects: ischaemic heart disease, hypertension, high annoyance and sleep disturbance. WHO makes recommendations to policy makers to reduce road sound exposure to below a range of guideline values. Dr Chiles concluded that the relief sought by Waka Kotahi was consistent with this direction.

7.28 The Hearings Panel agreed that road traffic noise is a genuine resource management issue. While Waka Kotahi proposed a noise attenuation standard in its evidence, the Panel ultimately incorporated its own standard into the Drury 2 Precinct. The applicant proposes to incorporate the Panel's version of the noise attenuation standard into the Highbrook Precinct. In PC51, Waka Kotahi submitted a section 32AA evaluation report in support of the noise attenuation requirements. For section 32 evaluation purposes,

Waka Kotahi's assessment as provided in PC51 hearing is included in Appendix 5 to this Planning Report.

Ecology

7.29 An Ecological Assessment for the PC area has been completed by Treffery Barnett of Bioresearchers. With respect to the ecological values present within PC area, the Ecological Assessment states that:

- There are no Natural Resources overlays applying to the PC area (i.e. in particular it is noted that there no areas identified as Significant Ecological Areas).
- The PC area was cleared of all vegetation for farming (except for a small amount of coastal fringe vegetation); further modified with the addition of and removal of the Ōtāhuhu Power Station; then the construction of Highbrook Drive, followed by landscape planting.
- The vegetation present on the site is a mix of rank grass, native plantings and exotic week species, transitioning to mangroves in the CMA area. Although the native plantings near the coastal edge are now well established, they comprise of common native species, and are strongly influenced by weed species.
- Within the CMA, in the northern part of the PC area is a weir at the mouth of the Ōtara Creek, where it flows into Tāmaki River. The weir is used for roosting by a number of coastal bird species. Bird surveys between 2016 and 2022 of the birds utilising the weir identified sixteen native or endemic coastal bird species.

7.30 With respect to the ecological effects of the PC Request, the Ecological Assessment concludes that:

- The vesting of the esplanade reserve areas at the land development phase, presents the opportunity for increased community participation in enhancement of the coastal margin areas, and providing access to the Tāmaki River environments.

- The habitats in the Coastal Marine Zone would be improved with the removal of pest plants, control of pest animals, infill planting and enrichment planting in the future esplanade reserve areas.
- The birds identified as using the weir, are coastal bird species that are commonly or seasonally recorded throughout the Tāmaki River and wider environment. When utilising the weir and the surrounds, these bird species have acclimatised to the variable and high levels of noise and movement generated by the roads. The PC will result in increased use and access to the coastal environment by the public, but the weir structure is isolated and separated by water at high tide when the birds are roosting. Furthermore, the birds utilising the weir are habituated to variable noise levels and disturbance.

Infrastructure servicing (water and wastewater)

7.31 An Infrastructure Report for the PC area has been prepared by Michael Martin of Babbage. It sets out information pertaining to the capacity of the existing public water and wastewater infrastructure to service future development within the PC area. There is no existing water and wastewater network within the PC area.

7.32 With respect to water supply, the Infrastructure Report states that:

- There is an existing 250mm public watermain located along the eastern berm of Highbrook Drive.
- To service the PC area, water supply reticulation will be required through the site, including watermains and a minimum size of 100mm and associated rider mains, valves, fittings and hydrants. The onsite water supply reticulation will need to be designed and constructed in accordance with Watercare's Code of Practice.
- Watercare has confirmed in writing that there is sufficient capacity in the public water supply network to service the development in the PC area for residential land use.

7.33 With respect to wastewater supply, the Infrastructure Report states that:

- There is an existing 825mm public transmission pipe located approximately 230m south of the PC area. This transmission pipe connects to the pump station approximately 650mm west of the site in Billington Reserve.
- To service the PC area, wastewater supply reticulation will be required through the site. This is likely to be a gravity system discharging to an onsite pump station, likely to be located in the southern part of the PC area, to allow a rising main connection to the existing wastewater transmission pipe near Hellabys Road. The onsite pipes are likely to be 150mm diameter, although some 225mm diameter pipes may also be required. The onsite and offsite wastewater reticulation systems will need to be designed and constructed in accordance with Watercare's Code of Practice.
- Watercare has confirmed in writing that there is sufficient capacity in the public wastewater network to service the development in the PC area for residential land use.

Stormwater Management Plan

7.34 Auckland Council holds a Region-wide Stormwater Network Discharge Consent ("**NDC**") that authorises the diversion and discharge of stormwater in the Auckland Region. The area covered by the NDC includes all urban zoned land (which includes the PC area). The preparation of a Stormwater Management Plan is a requirement of the NDC for any activity seeking to utilise or fall within the parameters of the NDC, by having the Stormwater Management Plan being "adopted" into the NDC framework.

7.35 In relation to a plan change process, condition 13(b) of the NDC states that following the approval of a plan change, a Stormwater Management Plan is able to be adopted into the NDC if a Stormwater Management Plan has been prepared to support the plan change and the plan change is consistent with that Stormwater Management Plan; and the Stormwater Management Plan is consistent with Schedules 2 and 4 of the NDC.

7.36 A Stormwater Management Plan ("**SMP**") for the PC area has been prepared by Suman Khareedi of Babbage. The SMP:

- Details how stormwater runoff will be managed within the PC area; and
- Demonstrates how the stormwater management related expectations under the AUP(OP) and the NDC requirements can be met.

7.37 The outcomes sought by the SMP are:

- An integrated stormwater management approach.
- A water sensitive treatment framework that manages and mitigates stormwater effects arising from the proposed residential use of the PC area.
- Provides for the enhancement of the Tāmaki River environments.
- Identifies flood risk areas and ensures that development is located or appropriately managed within these areas.
- A set of Best Practice Options for stormwater management that can be applied to the PC area.

7.38 With respect to the existing stormwater infrastructure on the site, the SMP states that:

- A new stormwater management system will replace the current stormwater management system within the PC area, comprising of table drains, a 300 mm stormwater culvert, and a catchpit.
- The existing stormwater pond that treats runoff from a small area (0.9ha) of Highbrook Drive will need to be decommissioned to enable development within this portion of the PC area. To enable the decommissioning of this pond, the proposal is to combine the treatment of runoff from the aforementioned area of Highbrook Drive with that from the remainder part of the PC area in device(s) to be constructed. Once vested in Auckland Council, this will reduce the operation and maintenance requirements due to the removal of one treatment pond.

7.39 Based on the topography of the site and the THAB Zone outcomes, the SMP identifies the following four options for stormwater treatment within the PC area:

- Option 1: A wetland (or a coastal wetland) constructed in conjunction with the creation of the esplanade reserve along the banks of the Tāmaki River.
- Option 2: Two stormwater treatment ponds at both ends of the PC area to treat approximately half the site in each pond.
- Option 3: Proprietary treatment devices (viz., Stormfilters) at both ends of the PC area to treat approximately half the site in each device.
- Option 4: Raingardens constructed along the proposed road.

7.40 The SMP states that raingardens under Option 4 are not preferred due to the operation and maintenance requirements and AT's preference to not have them in the road corridor. Therefore, options 1, 2 and 3 are recommended for the PC area. A detailed design of the stormwater management system based the three feasible options identified will be included in the resource consent application at the land development stage.

7.41 With respect to flooding and overland flow paths within the PC area, the SMP states that:

- Based on rapid flood modelling, Auckland Council has identified three overland flow paths through the PC area. Site inspection has confirmed that there are no overland flow paths entering the PC area from neighbouring land, however, there are two overland flow paths that start within the PC area, which coincide with the table drains along the existing gravel roads. The future road network for the PC area is able to be aligned with the existing gravel road, as such the overland flow paths within the PC area can remain largely unchanged after development. Furthermore, future development of the PC area is not expected to affect the downstream properties by way of new or altered overland flow paths, as the stormwater discharges directly to Tāmaki River.
- The PC area, and the properties along the banks of Tāmaki River downstream of the PC area, are neither flood prone nor flood sensitive.

- However, with respect to coastal inundation, by linear interpolation, the 1% AEP (0.01 AEP) maximum storm-tide plus wave setup elevation with inferred wave setup component subtracted at the PC area is estimated to be RL 2.34m. This results in a small area of the PC (in the vicinity of the barge dock and the northern tip of the PC area) that is at RL 2.0 m gets inundated by up to 3.40mm (0.34m) during a 1% AEP event. The future development of the PC area within this identified area, will need to ensure that future habitable floor levels of buildings are higher than RL3.34m. It is also noted that a significant part of the identified area will from part of the future esplanade reserve area.

7.42 With respect to hydraulic connectivity, the SMP states that:

- The post development stormwater management system for the PC area comprises of a pipe network and treatment devices. The pipe network to service the PC area will be independent of the existing Auckland Council's stormwater network due to the PC area's location in relation to the existing pubic stormwater network. Stormwater flows from the PC area will discharge directly into Tāmaki River after treatment. Hydraulic connectivity will be directly to the Tāmaki River flows. The time of concentration ("**ToC**") for the flows from the PC area will be significantly less than the ToC for the flows in the Tāmaki River or the Ōtara Creek in the vicinity of the PC area.

7.43 With respect to the matter of water quality, the SMP states that the proposal is to treat stormwater runoff from the PC area using new treatment devices that will be designed to comply with the Auckland Design Manual GD01.

7.44 The SMP anticipates that the stormwater management system to be developed for the PC area will be vested in Auckland Council. No bespoke operation and maintenance requirements are envisaged for the stormwater management systems proposed for the PC area. They will be consistent with the operation and maintenance requirements of the wider Auckland Council stormwater network.

7.45 The SMP confirms that the principles outlined for the proposed stormwater management system is consistent with the objectives of the NDC, and meets the

connection requirements under Schedule 4 of the NDC. There are no departures proposed from the Auckland Council Code of Practice or the connection requirements of the NDC.

7.46 With respect to the overall stormwater effects on the receiving environment, the SMP concludes that the THAB Zone will have a lesser impact on the environment than the current Light Industry Zone. Under the AUP(OP), the maximum permissible impervious area in the THAB Zone is less than that in the Light Industry Zone. The rezoning of the PC area will result in reduced stormwater runoff volume and peak flows into the receiving environment. Rezoning the land as proposed will not result in any material difference in water quality, as in both cases, stormwater runoff will need to be treated to comply with the guidelines in GD01 and conditions of the NDC.

7.47 The SMP states that under Option 1, the opportunity to create wetland along the bank of the Tāmaki River will result in high level of amenity for the public, similar to the stormwater treatment facilities in the Highbrook Business Park further north along Highbrook Drive. This is an option which can be investigated in greater detail at the land development phase.

7.48 It is concluded that the PC Request is appropriate from a stormwater infrastructure perspective, as the SMP demonstrates that stormwater will be able to be managed in accordance with the requirements of the AUP(OP) and the connection requirements outlined in Schedule 4 of the NDC for private greenfield development.

Geotechnical matters

7.49 A Geotechnical Appraisal Report for the PC area has been completed by Jordan Moll of Babbage. It provides the results of the geotechnical feasibility assessment to inform the PC Request.

7.50 The Geotechnical Appraisal Report makes the following observations with respect to the PC area:

- The ground conditions are expected to comprise of clay, silt and sand of the Puketoka formation, overlain in part by tuff and other AVF deposits and/or surficial fill.
- With respect to liquefaction potential of the PC area, the anticipated ground conditions comprise predominantly stiff to hard cohesive material for the majority of the soil profile. Thin lenses of silty sand and sandy silt may be present which are more susceptible to liquefaction. However, considering the relatively low peak ground accelerations associated with the design earthquake events, the competent cohesive material present in the upper profile acting as a non-liquefiable "crust", surface manifestations of liquefaction is considered highly unlikely. Further assessment of PC area's liquefaction susceptibility will be required during the detailed design phase.
- The majority of the site is flat, and not considered to be susceptible to slope stability issues. Development in close proximity to the northern slopes will require further consideration at detailed design phase.
- With respect to coastal erosion, wave action is not expected in the Tāmaki River, therefore, the risk of erosion affecting the PC area is considered highly unlikely.
- Future building foundations will depend on the structural loads.
- With respect to earthworks, ground conditions are expected to be suitable for cut material to be re-used as engineered fill.

7.51 The Geotechnical Appraisal Report concludes that:

- Based on a desk top study, PC area is considered to be geotechnically suitable for the proposed residential land use.
- Further geotechnical assessment and site-specific geotechnical investigations will be required at the land development stage to support the future resource consent application. Investigation locations should focus on any retaining walls and proposed building locations once the detailed design is confirmed.

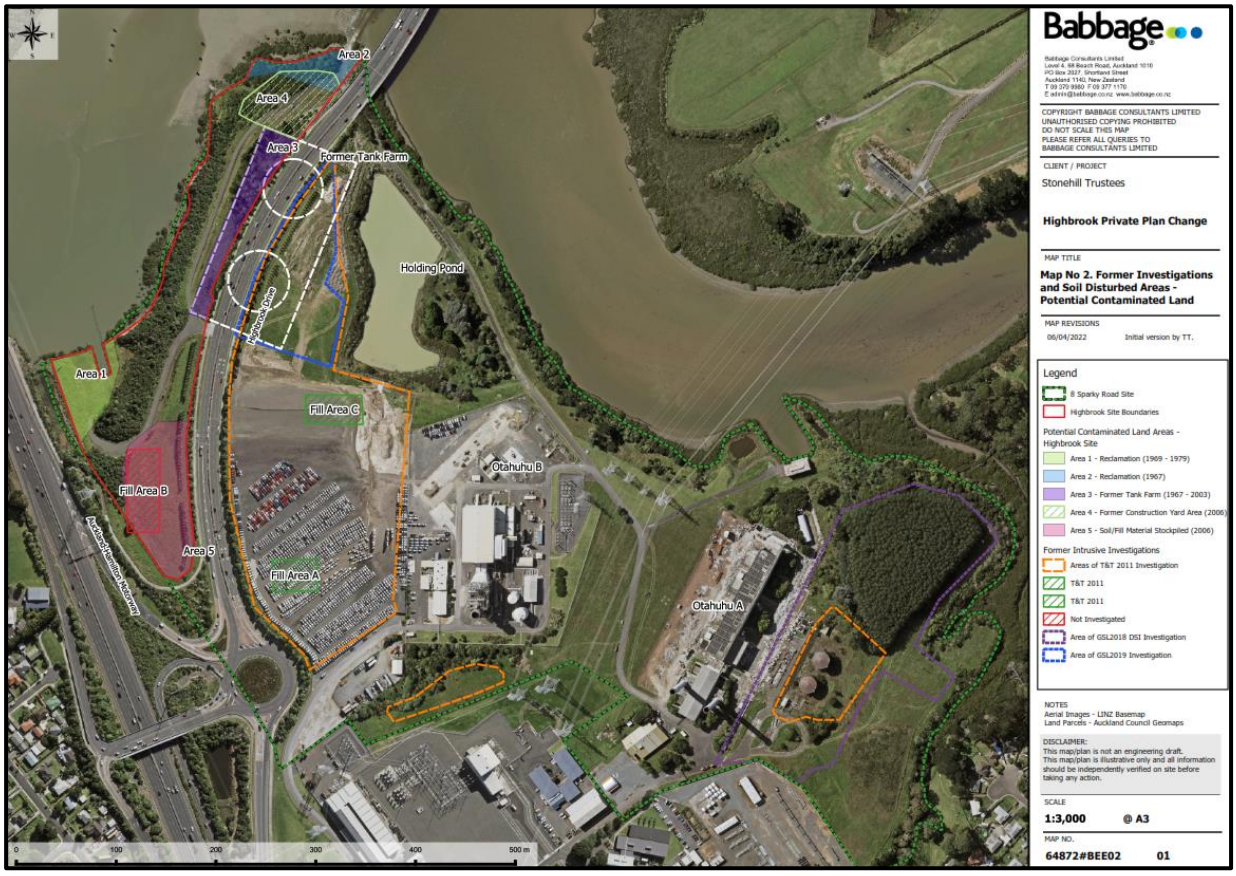
Land contamination

7.52 A Land Contamination Review Report (hereon referred to as the Land Contamination Report) for the PC area has been completed by Tiago Teixeira and Hiram Garcia of Babbage. The Report is a desktop study to identify current or historical potential contamination sources in the PC area.

7.53 The Land Contamination Report has identified five areas that have potentially impacted soil from previous activities (refer Figure 7-2):

- Area 1: reclaimed land, 1969 – 1979
- Area 2: reclaimed land, 1967
- Area 3: former tank farm, 1967 – 2003
- Area 4: former construction yard area, 2004 - 2006
- Area 5: soil/fill material stockpiled area, 2006

***Figure 7-2**: Areas that have potentially impacted soil from previous activities within the PC area*



7.54 The findings of the Land Contamination Report are:

- The five areas identified as potentially impacted soil from previous site activities cover approximately half of the PC area.
- However, only 33% of the PC area is considered to have medium or high likelihood to present soil contamination which may exceed applicable human health and environment guidelines. These areas comprise of reclaimed land Areas 1 and 2 near the Tāmaki River bank and Area 5 (soil/fill material stockpiled area).
- Area 3 (former tank farm) and Area 4 (former construction yard area) are anticipated to have low likelihood of encountering soil impacts above the applicable proposed land use criteria.

- In the event that the soil impacts are encountered above the applicable proposed land use criteria, implementation of remediation / management practices can be adopted to remove or isolate those impacted.

7.55 The Land Contamination Report concludes that there are no known soil contamination impacts that would impede the use of PC area for residential uses. The potential land remediation works are able to be completed at the land development phase, in accordance the requirements of the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ("**NESCS**").

7.56 Chapter E30 Contaminated Land of the AUP(OP) addresses the effects of discharge of contaminants from contaminated land or land containing elevated concentrations of contaminants into air and water and into or onto land. An assessment of the resource consent requirements in Chapter E30 for any future development will need to be based on the findings of the Detailed Site Investigations, together with the proposed earthworks design for the proposed development.

Effects on Mana Whenua

7.57 Section 8 of the RMA requires all persons exercising functions and powers under it, in relation to managing the use, development, and protecting of natural and physical resources, to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

7.58 Chapter B6 of the AUP (OP) recognises issues of significance to Maori and iwi authorities in the region. Section B6.2 outlines the objectives and policies in recognition of the Treaty of Waitangi/ Te Tiriti o Waitangi partnerships and participation.

7.59 Objective B6.2.1(1) requires that principles of the Treaty of Waitangi/ Te Tiriti o Waitangi be recognised and provided for in the sustainable management of natural and physical resources including ancestral lands, water, air, coastal sites, wāhi tapu and other

taonga and objective B6.2.1 (2) requires that the principles are recognised through Mana Whenua participation in resource management processes.

7.60 In the context of the RMA, the principles of the Treaty of Waitangi include:

- Partnership
- Mutual obligations to act reasonably and in good faith
- Active protection
- Mutual benefit – this incorporates enabling aspects for both Māori and non-Māori.
- Development – the Treaty is to be adopted to modern, and changing circumstances.
- Rangatiratanga – recognising iwi and hapū rights to manage resources or kaitaiakitanga over their ancestral lands and waters.

7.61 From a plan change development point of view, Objective B6.2.1(2) is considered to be more relevant due to its specific nature. Objective B6.2.1(2) notes that the principles of the Treaty of Waitangi are recognised through Mana Whenua participation in the resource management process. In practice, this objective means working with Mana Whenua to identify resource management issues of significance and identifying methods for resolving these issues and achieving the desired outcomes.

7.62 In order to achieve Objectives B6.2.1(1) and B6.2.1(2), the applicant contacted all iwi groups with a possible interest in the plan change area. Letters were sent to the following ten Mana Whenua groups to engage in a meaningful way in the development of the Plan Change:

- Ngāti Maru Rūnanga
- Ngāti Tamaterā
- Ngāti Whanaunga
- Te Ahiwaru – Waiohua
- Ngāti Pāoa
- Waikato - Tainui

- Te Kawerau ā Maki
- Ngāti Te Ata
- Ngāti Tamaoho
- Te Ākitai Waiohua
- Ngāi Tai Ki Tāmaki

7.63 Responses were received back from Ngāti Te Ata, Ngāti Tamaoho, Te Ākitai Waiohua and Ngāi Tai Ki Tāmaki, expressing an interest in the PC area. A summary of the consultation to date is set out in section 9 of this Planning Report. Representatives of Ngāti Te Ata and Te Ākitai Waiohua have confirmed that a cultural values assessment will be prepared after the PC Request has been lodged.

7.64 Ngāti Tamaoho has provided a Cultural Values Assessment ("CVA") and is set out in Appendix 4 as Technical Report 10).

7.65 The applicant is committed to on-going genuine consultation with the above Mana Whenua groups that have expressed interest in the PC area.

7.66 The CVA provided by Ngāti Tamaoho identifies potential cultural impacts of the PC Request. In particular, Ngāti Tamaoho is concerned about the direct/indirect cumulative effects of the PC on the following cultural sites, areas and resources:

- It is part of Ngā Tapuwae O Mataoho, a cultural landscape connected to the atua Mataoho. This includes the nearby Puke-arikinui and Pukewairiki craters as well as Kohuora, Pukeōtara, and Ōtāhuhu. Puke-arikinui and Pukewairiki were utilised as a pā and wāhi tapu. The surrounding areas of fertile soil were cultivated as extensive mārakai.
- Adjoins Wai O Taiki (Tāmaki River). This is awa and is of great importance. It included ara waka, mahinga kai, puna wai, rawa taiao, mahinga rongoā and so much more. The awa and their waters are part of Ngāti Tamaoho whakapapa, vital to cultural identity and health.

7.67 The relevant principles of the Treaty of Waitangi/Te Tiriti o Waitangi that have been cited in section 11 of the CVA by Ngāti Tamaoho are listed below:

- To ensure that the mana of their people is upheld, acknowledged and respected;
- That their people have rangatiratanga (opportunity to participate, be involved and contribute to decision making) over their ancestral Taonga;
- That as kaitiaki, they fulfil their obligation to the environment in accordance with their customs as passed down and to be accountable to their people (current and future generations) in these roles as custodians; and
- To uphold the mauri of their taonga- tuku- iho and those things deemed as cultural treasures handed down by tupuna and their obligations as kaitiaki to protect, and preserve.

7.68 Ngāti Tamaoho outline the following recommendations:

- The applicant to continue their relationship with Ngāti Tamaoho throughout all phases of the development;
- To allow for a site blessing of the PC area and cultural monitoring to ensure cultural heritage and values in the area and protected. This includes a cultural walk-over of the site;
- Ensure protection of any discovered cultural heritage sites, including a buffer along the river margin. Ngāti Tamaoho wish to provide a cultural map to identify particular areas of cultural concern;
- Allow Ngāti Tamaoho to educate workers on site with a cultural induction programme;
- Ensure that there will be no disturbance or destruction of cultural heritage sites or taonga, loss of mahinga kai areas, damage to Te Wai O Taiki along with addressing the needs of existing infrastructure.
- Produce a 'mana o te wai' plan to ensure the health of Te Wai O Taiki. Ngāti Tamaoho have requested involvement in water planning for the PC site. More specific requirements have been outlined in section 15 of the CVA.

- Cultural input in the design of the development at detailed design phase.

7.69 The applicant is committed to undertaking further consultation with Ngāti Tamaoho and establishing a long- term relationship to ensure that the recommendations set out in the CVA are implemented at the land development phase.

8 ASSESSMENT OF STATUTORY AND NON-STATUTORY DOCUMENTS

8.1 Section 75 of the RMA states that a district plan must give effect to: any national policy statement; New Zealand Coastal Policy Statement; a national planning standard and any regional policy statement. A district plan must not be inconsistent with a regional plan for any matter specified in section 30(1).

8.2 An assessment of how the PC gives effects to (or is not inconsistent with) the following statutory and non-statutory documents is set out below:

- Part 2 of the RMA
- New Zealand Coastal Policy Statement 2010
- National Policy Statement for Freshwater Management 2020
- National Policy Statement on Urban Development 2020
- Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
- Hauraki Gulf Marine Park Act 2000
- The Auckland Plan 2050
- The Auckland Regional Policy Statement
- Auckland Unitary Plan – Objectives and Policies

Resource Management Act 1991

8.3 Part 2 of the RMA sets out the Act's purpose and principles in sections 5 to 8. The overriding purpose of the RMA is to promote the sustainable management of natural and physical resources.

8.4 Section 5 of the RMA sets out the purpose of the RMA, and requires a broad judgement as to whether the proposal would promote the sustainable management of natural and

physical resources. This exercise of judgement is informed by the principles of sections 6 to 8, and considered in light of the particular circumstances of each application.

8.5 This Planning Report contains an assessment of the various options for rezoning of the PC area, and assessed these options against the Purpose of the Act. Overall, it is considered that the PC Request will enable a more effective means of achieving the sustainable management purpose of the Act than the current zoning applied to the PC area.

8.6 With respect to section 5, the PC provides for the social, economic and cultural well-being of the community by increasing the supply of housing in Auckland, in a strategic location, while avoiding, remedying and mitigating any adverse effects on the environment.

8.7 Section 6 of the RMA sets out a number of matters of national importance which must be recognised and provided for. With respect to section 6, it is noted that:

- *Section 6(a)*: The Landscape Report explains that the PC area has been modified previously, and the it does not contribute to the natural character values of the coastal environment. As such, the natural characteristics and qualities that contribute to the natural character of the coastal environment would not be adversely affected by development enabled by the PC Request.
- *Section 6(b)*: The PC area is not located within area classified as an Outstanding Natural Landscape or High Natural Character in the AUP(OP).
- *Section 6(d)*: The esplanade areas adjoining Tāmaki River environments will be vested in Auckland Council at the land development/subdivision stage. This will provide opportunities for public walking access along the edge of the Tāmaki River.
- *Section 6(e)*: the applicant committed to working with Mana Whenua t recognise the relationship of maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.

8.8 Section 7 identifies a number of "other matters" to be given particular regard to by a territorial authority. With respect to section 7, it is noted that:

- *Sections 7(a) and (aa)*: the applicant is committed to working with Mana Whenua to enable consideration of matters relating to kaitiakitanga and the ethic of stewardship.
- *Section 7(b)*: it has been determined that that the PC area is not suitable for its intended use under the Light Industry Zone. The PC Request seeks more intensive use of the subject land, thereby enabling more efficient use of this important land resource, to contribute towards increasing housing supply in Auckland.
- *Section 7(c)*: the amenity values and the quality of the quality of the residential environment are acknowledged and will be enhanced via the implementation of the existing Auckland-wide and THAB Zone provisions of the AUP(OP).

8.9 Section 8 requires the principles of Treaty of Waitangi (Te Tiriti o Waitangi) to be taken into account. With respect to section 8, the mana whenua participation was recognised and sought in the preparation of the PC Request. In this regard, letters were sent to relevant mana whenua groups to seek engagement in a meaningful way, refer to section 9 of this Planning Report.

New Zealand Coastal Policy Statement 2010

8.10 The purpose of the NZCPS is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. As the PC area is located within the coastal environment, the provisions of NZCPS are relevant matters for consideration for the PC Request.

8.11 Overall, the PC is considered to be consist with the NZCPS and gives effect to the relevant objectives and policies as follows:

- Objective 2 seeks to protect the natural character of the coastal environment and protect natural features and landscape values. Policy 13 requires preservation of the natural character of the of the coastal environment and protect it from inappropriate subdivision, use and development. Adverse effects on the

outstanding natural character are to be avoided, remedied or mitigated. The PC accords with Objective 2 and Policy 13, as the PC area it is not located within an area classified as an Outstanding Natural Landscape or High Natural Character in the AUP(OP). The Landscape Report explains that the PC area has been modified previously, and the it does not contribute to the natural character values of the coastal environment. The natural characteristics and qualities that contribute to the natural character of the coastal environment would not be adversely affected by development enabled by the PC Request. The provision of the esplanade reserve areas in the future would enhance the natural character values of the Tāmaki River edge.

- Policy 14 promotes the restoration or rehabilitation of the natural character of the coastal environment. The Landscape Report states that the existing vegetation along the coastal edge is not managed for its natural values and noxious weed species are present, adversely affecting the natural character of the area. The future development of the PC area will provide opportunities for enhancement of the esplanade reserve areas.
- With respect to Objective 3 and Policy 2, which requires that the principles of Treaty of Waitangi be taken into account, mana whenua participation was recognised and sought in the preparation of the PC Request. In this regard, letters were sent to relevant mana whenua groups to seek engagement in a meaningful way, as explained in section 9 of this Planning Report.
- Objective 4, Policy 18 and Policy 19 seek to maintain and enhance public open space qualities and recreational opportunities of the coastal environment. The esplanade areas adjoining Tāmaki River environments will be vested in Auckland Council at the land development stage. This will provide opportunities for public walking access along the edge of the Tāmaki River. The vision for the PC area is to create a community focal point by integrating open space areas and esplanade reserve areas into the site design.
- Policies 23(4) requires that in managing discharges of stormwater, take steps to avoid adverse effects of stormwater discharge to water in the coastal environment

on a catchment by catchment basis. A SMP has been prepared for the PC area, which actively seeks to manage discharges of stormwater and contaminants into the coastal environment. The SMP states that contaminants and sediment loadings in stormwater will be reduced at source, thereby reducing the overall effects on the ecosystems in the receiving environment.

National Policy Statement for Freshwater Management 2020

8.12 National Policy Statement for Freshwater Management 2020 ("**NPS-F**") sets a national framework for how freshwater is to be managed. NPS-F applies to all freshwater (including groundwater), and to the extent that they are affected by freshwater, to receiving environments such as estuaries and CMA.

8.13 The NPS-F only has one objective, which is to ensure that natural and physical resources are managed in a way that prioritises:

a) first, the health and well being of water bodies and fresh ecosystems;

b) second, the health needs of people; and

c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

8.14 Overall, the PC is considered to be consist with the NPS-F and gives effect to the relevant objectives and policies as follows:

- Policy 1 requires freshwater to be managed in a way that gives effect to Te Mana o te Wai. Policy 2 requires that tangata whenua are actively involved in freshwater management, and maori freshwater values are identified and provided for. In this regard, it is noted that in their CVA, Ngāti Tamaoho has recommended that a 'mana o te wai' plan be produced for the PC area, to enable them to be involved in the water planning for the PC area. The applicant is committed to working with Ngāti Tamaoho to implement this recommendation at the land development stage.

- Policy 3 requires that freshwater are managed in an integrated manner that considers the effects of the use and development of the land on a whole-of-catchment basis, including the effects on receiving environment. In the context of this PC Request, a SMP has been prepared to ensure that land use planning is integrated with the stormwater management strategy so that the effects on the receiving environment are considered holistically.
- Policy 6 seeks to ensure that there are no further loss of extent of natural inland wetlands, their values are protected and restoration promoted. The Ecological Assessment has confirmed that there are no wetland present within the PC area.
- Policy 7 seeks to ensure that there are no loss of river extent and values is avoided to the extent practicable. The Ecological Assessment has confirmed that there are no streams present within the PC area, nor does the PC result in the loss of the Tāmaki River extent.

National Policy Statement on Urban Development 2020

8.15 The National Policy Statement for Urban Development 2020 ("**NPS-UD**") recognises the national significance of:

- Having well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.
- Providing sufficient development capacity to meet the different needs of people and communities.

8.16 The NPS-UD is designed to improve the responsiveness and competitiveness of land and development markets. In particular, it requires local authorities to open up more development capacity, to enable more homes can be built in response to demand. The NPS-UD provides direction to ensure that capacity is provided in accessible places, helping New Zealanders build homes in the places they want - close to jobs, community services, public transport and other amenities enjoyed by the community.

8.17 Overall, the PC is considered to be consist with the NPS-UD and gives effect to the relevant objectives and policies as follows:

- Objective 1 seeks to ensure that New Zealand has a well-functioning urban environment that enables people and communities to provide for their social, economic, and cultural well-being, for their health and safety, now and into the future. Policy 1 sets out the list of matters which are deemed to contribute to "well-functioning urban environments". Implementing the THAB Zone provisions, the PC will enable the development of a variety of homes to meet the needs of different households. The PC area is strategically placed to enable accessibility to jobs and nearby Town Centres which provide community services and open spaces to cater to the needs of the future community. The PC provisions support public transport mode share by providing a bus stop and shuttle bus service to nearby public transport hubs. This will support reductions in greenhouse gas emissions. The PC area will be developed having regard to future effects of climate change.
- Objective 3 states that regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of urban environments in which one or more of the following apply: the area is or near a centre zone or other area with employment opportunities; well serviced by existing or future public transport; high demand for housing or business land, relative to other areas within the urban environment. In the context of Objective 3, the PC area is located in an urban environment in close proximity to the Highbrook industrial area, providing employment opportunities.
- Objective 4 recognises that urban environments, including their amenity values, develop and change over time in response to diverse and changing needs. It has been assessed that the PC area is not suitable to be developed for its intended use under the Light Industry Zone. In the context of Objective 4, it is recognised that the PC is an urban environment which requires a change in use, and the amenity values associated with the land use will change over time to meet the needs of the future community.

- Policy 8 requires local authority decisions affecting urban environments are responsive to plan changes that would add significantly to development capacity and contribute to well-functioning urban environments, even if the development capacity is unanticipated by planning documents; or out of sequence with planned land release. In the context Policy 8, while the development capacity of the PC area is unanticipated for residential use; the PC area is a large block of land (approximately 4ha), strategically located, is "infrastructure ready", able to be developed in line with THAB Zone provisions, to deliver a range of housing sizes of a high quality, and is able to be delivered within reasonable timeframes, thereby adding to the residential development capacity and contributing to the well-functioning urban environments.

Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

8.18 The NESCS is a nationally consistent set of planning controls and soil contaminant values. It ensures that land affected by contaminants in soil is appropriately identified and assessed before it is developed; and if necessary the land is remediated or contaminants contained to make the land safe for human use.

8.19 A Land Contamination Report for the PC area has been completed and it identifies five areas within the PC area that have potentially impacted soil from previous activities. The Land Contamination Report concludes that there are no known soil contamination impacts that would impede the use of PC area for residential uses. The potential land remediation works are able to be completed at the land development phase, in accordance the requirements of the NESCS.

Hauraki Gulf Marine Park Act 2000

8.20 The Hauraki Gulf Marine Park Act 2000 ("**HGMPA**") provides special recognition for the Hauraki Gulf and has implications for the resource management framework. The PC area

is located beside Tāmaki River, an area identified as falling within the catchment for Hauraki Gulf in Schedule 3 of the HGMPA.

8.21 Section 13 of the HGMPA states that all persons exercising powers of functions for the Hauraki Gulf under any Act (which includes the RMA) must have particular regard to the provisions of sections 7 and 8 of the HGMPA. Section 10 of the HGMPA states that for the coastal environment of the Hauraki Gulf, sections 7 and 8 of the HGMPA must be treated as a New Zealand coastal policy statement issued under the RMA.

8.22 Section 7 of the HGMPA states that the interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance.

8.23 Section 8 of the HGMPA sets out the objectives of the management of the Hauraki Gulf, its islands, and catchments to recognise the national significance of the Hauraki Gulf.

8.24 The PC area is located at the bottom of the Ōtara Creek catchment. The stormwater flows from the PC area will discharge to the Tāmaki River. A SMP has been prepared to detail how the stormwater runoff from the PC area will be managed; and demonstrate how the stormwater management related expectations under the AUP(OP) and the NDC requirements can be met.

8.25 The SMP identifies the following principles for stormwater management within the PC area:

- Provision of quality stormwater infrastructure: it is vital to provide quality stormwater infrastructure to maintain healthy waterways and to mitigate risk to communities, people and property.
- Water quality management: Significant Ecological Areas ("SEA") are mapped upstream of the PC area and on the far bank of the Tāmaki River (opposite side of the PC area). As such, maintaining or improving water quality in the Tāmaki River and Ōtara Creek is a priority for the stormwater management of the PC area.

- Mitigation of erosion at the outfall and protection/enhancement of the SEA: There are no known coastal erosion areas along the banks of the Tāmaki River along the PC area boundary. It is important to maintain this condition post development. The stormwater systems proposed for the PC area should protect and enhance the banks of the Tāmaki River.
- Mitigating the risk of 1% peak flows having adverse impacts on development.

8.26 In line with the above stormwater management principles, the SMP proposes the following design of future stormwater management system:

- The new stormwater system will be a piped reticulation with suitable stormwater treatment devices complying with Auckland Council's Stormwater Code of Practice.
- Stormwater runoff from the entire PC area will be treated using new treatment devices that will be designed to comply with GD01. Based on the topography of the PC area, four options for the treatment of the stormwater runoff from the PC area have been identified: a wetland, two stormwater treatment ponds, proprietary treatment devices, or raingardens.
- The stormwater system will be designed to have adequate capacity to convey 10% AEP event flows.
- The future development of the PC area will be carefully designed to ensure that habitable rooms are not proposed in the small section the PC area that is prone to inundation.
- Stormwater flows from the PC area will discharge directly into Tāmaki River after treatment. Hydraulic connectivity will be directly to the Tāmaki River flows. The time of concentration ("ToC") for the flows from the PC area will be significantly less than the ToC for the flows in the Tāmaki River or the Ōtara Creek in the vicinity of the PC area.

8.27 The PC is consistent with the purpose of the HGMPA for the following reasons:

- The PC integrates the land use planning and stormwater management strategy to recognise the interrelationship between the Hauraki Gulf and its catchments.

- The SMP has been prepared, and it has given particular regard to the stormwater management principles relevant for the PC area and its receiving environments, to ensure the protection and enhancement of the life-supporting capacity of the environment of the Hauraki Gulf.
- The SMP demonstrates that stormwater within the PC area will be manged in accordance with the requirements of the AUP(OP) and the connection requirements outlined in Schedule 4 of the NDC for private greenfield development.

The Auckland Plan 2050

8.28 The Auckland Plan 2050 is a long-term spatial plan for Auckland. It outlines three key challenges facing Auckland, and sets the direction for addressing these challenges over the next 30 years. The three key challenges are:

- *Population growth and its implications*: over the next 30 years population of Auckland will reach 2.4 million people (an increase of 720,000). This means that another 313,000 dwellings and 263,000 jobs are required over this period.
- *Sharing prosperity with all Aucklanders*: need to ensure that all Aucklanders benefit from social and economic prosperity that growth brings and can participate and enjoy community and civic life.
- *Reducing environmental degradation*: Auckland's natural environment and cultural heritage are vulnerable to degradation from the impacts of human activities. Urban development and effects of climate change are two specific issues that have the biggest effect on Auckland's environment.

8.29 The Auckland Plan sets out a Development Strategy, to illustrate how Auckland will physically grow and change over the next 30 years. It takes account of the outcomes sought to be achieved, population growth projections and planning rules set out in the AUP. It also provides a framework to prioritise and coordinate the required supporting infrastructure.

8.30 The Development Strategy seeks to deliver a quality compact urban form, building strong urban centres and neighbourhoods. It also recognises that while much of the growth will occur in nodes and development areas, some growth will take place in the remaining urban areas.

8.31 The PC is consistent with the vision and outcomes articulated in the "Homes and Places" outcomes of the Auckland Plan for the following reasons:

- The Auckland Plan allows opportunities for more intensive living and working environments, and for more housing to be built around areas of activity and close to good transport options. The PC area is located within the RUB, and it is located within walking distance of Highbrook Business Park, and in close proximity to a major employment hub in Highbrook / East Tāmaki / Ōtara area. In order to support public transport mode share, the PC provisions provide for a bus stop and shuttle bus service to connect to nearby public transport hubs. The PC provisions ensure that good transport options are available to future residents.
- The Auckland Plan states that a quality compact approach would be achieved by leveraging existing infrastructure investments. The PC area is located within an urban environment, without any water or wastewater capacity constraints to service the future development. Furthermore, the ITA has identified that no significant transport infrastructure upgrading is required to service the PC area.
- The Auckland Plan states that Auckland will likely require another 320,000 dwellings to be built by 2050, and current levels of construction fall well below the demand. The Auckland Plan seeks to accelerate quality development at scale that improves housing choice. In this regard, the PC area is a large block of land (approximately 4ha), strategically located, is "infrastructure ready", able to be developed in line with THAB Zone provisions, to deliver a range of housing sizes of a high quality, and is able to be delivered within reasonable timeframes.
- The Auckland Plan seeks to provide sufficient public spaces and spaces that are inclusive, accessible and contribute to urban living. The PC area is strategically located to enhance the use and enjoyment of the open space environments of the Tāmaki River in its proximity. The PC area is a large block of land that enables open

spaces to be strategically designed for use and enjoyment, taking into account the esplanade reserve areas to be vested as part of the future development. The PC vision is to create a community focal point by integrating public open spaces and small-scale activities adjoining the esplanade reserve areas. This will create well designed, inclusive environments where people living within the PC area are able to use as extensions of their living spaces, creating a sense of community.

The Auckland Unitary Plan - Regional Policy Statement

8.32 The Auckland Regional Policy Statement ("**RPS**") achieves the purpose of the RMA by providing an overview of the resource management issues of Auckland Region and policies and methods to achieve integrated management of natural and physical resources of the Auckland Region.

8.33 Chapter B2 of the AUP(OP) sets out the strategic framework to guide Auckland's urban growth and form. In summary, the PC will give effect to the RPS as follows:

- The PC enables intensification of urban area for residential purposes within the RUB. The THAB Zone will enable the PC area to be developed to provide a range of housing types at a greater intensity, close to public transport, social facilities (including open space) and employment opportunities.
- The PC aligns with the quality compact urban form policy which enables rezoning of land within the RUB to accommodate urban growth that supports quality compact urban form, provides for a range of housing types and integrates with the provision of infrastructure.
- The PC integrates land use and transport by supporting a range of transport modes.
- Via the implementation of the THAB Zone provisions, the PC will deliver a quality-built environment, including responding to the intrinsic qualities and physical characteristics of the PC area and its setting.
- The PC area will be adequately serviced by existing or upgraded infrastructure at the same time as residential intensification.

- There are no urban activities within the PC area that has the potential to raise concerns relating to reverse sensitivity effects due to the proposed residential intensification.
- The Light Industry zoning of the PC area does not align with the objectives and policies framework for industrial growth, as the current zoning does not enable the efficient use of this Light Industry zoned land for industrial activities.
- The PC area is a relatively isolated site, and is separated from the Light Industry zoned land in its proximity by Highbrook Drive and Ōtara Creek. The AUP(OP) has a strong objective and policy framework in place, which will ensure that any reverse sensitivity effects are appropriately managed.
- Future vesting of esplanade reserve areas within the PC area will ensure that public have access along the margins of Tāmaki River, which will connect to the wider walkway network.

8.34 Chapter B3 of the AUP(OP) sets out the strategic framework with respect to infrastructure, transport and energy. Of particular relevance to the PC is Policy B3.3.2(5), which seeks to improve the integration of land use and transport. In this regard, it is noted that the PC is informed by an ITA, the key recommendations of which are included in the proposed Highbrook Precinct. The ITA states that the encouragement of public transport modes enables the adverse effects of the traffic generated by the proposed development to be mitigated. The approved site access provides safe travel to the proposed new bus stop, and the proposed shuttle service will provide safe travel to the wider public transportation system. This will ultimately provide benefits of an integrated network by providing future residents with transportation choices, thereby, reducing the effects of generated traffic by reducing the relative demand for private vehicle travel. In summary, the PC area location enables access to a variety of transportation modes.

Auckland Unitary Plan – THAB Zone Objectives and Policies

8.35 The THAB Zone is a high-intensity zone, and provides for urban residential living in the form of terrace housing and apartments. This zone is predominantly located around metropolitan, town and local centres and public transport network to support the highest level of intensification. The purpose of this zone is to make efficient use of land and infrastructure, increase the capacity of housing and ensure that residents have convenient access to various services.

8.36 In summary, the PC (proposed THAB Zone and Highbrook Precinct) is considered to be consistent with the objectives and policies framework of the THAB Zone for the following reasons:

- The PC area is located close to a wide range of activities, including commercial, employment hub, community facilities and open spaces. Intensification of the PC area will result in creating a well-functioning urban environment that enables people and communities to provide for their social, economic, cultural well-being and health and safety.
- The PC area will be developed in accordance with the requirements of the THAB Zone provisions, which will ensure that future development achieves a built form that contributes to high quality-built environment.
- The PC will enable the land to be used efficiently, providing for high density development that increases housing capacity and choice and providing access to nearby centres and enabling pubic transport usage.
- With respect to building heights enabled within the THAB Zone, the Landscape Report states that the existing outlook of the PC area will change noticeably from a vegetated and undeveloped scene into a comprehensive urban view with a hierarchy of heights and forms. However, change resulting from the application of the THAB Zone building heights would not be unexpected noting the current planning provisions applying to the PC area under the Light Industry Zone. Hence, the application of the THAB Zone will not result in significant adverse effects on the character or amenity of the local area.

9 KEY STAKEHOLDER CONSULTATION

9.1 Consultation undertaken to inform the development of the PC Request is set out in Table 9-1 below.

***Table 9-1**: Consultation summary*

Key stakeholder/ Organisation	**Summary of Consultation**
• Ngāti Maru Rūnanga • Ngāti Tamaterā • Ngāti Whanaunga • Te Ahiwaru – Waiohua • Ngāti Pāoa • Waikato - Tainui	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. No interest was registered.
Te Kawerau ā Maki	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. Response received on 4 November 2021, confirming that Te Kawerau ā Maki have shared ancestral interests in the PC area and have extremely high cultural sensitivity in relation to the awa and the shoreline. Te Kawerau ā Maki deferred to their whanaunga Kaitiaki to respond to and lead input into the PC Request: Ngāti Pāoa, Te Ākitai Waiohua and Ngāti tai ki Tāmaki.

Key stakeholder/ Organisation	Summary of Consultation
Ngāti Te Ata	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. A meeting with Ngāti Te Ata's representative was held on 13 December 2021, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The full PC Request documentation will be provided to Ngāti Te Ata on following lodgement. The applicant is committed to ongoing consultation with Ngāti Te Ata.
Ngāti Tamaoho	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. A meeting with Ngāti Tamaoho's representatives was held on 13 December 21. An overview of the plan change was provided. Ngāti Tamaoho has prepared a Cultural Values Assessment (Technical Report 10 in Appendix 4). Refer to section 7 of this Planning Report for discussion on the Cultural Values Assessment provided by Ngāti Tamaoho.

Key stakeholder/ Organisation	Summary of Consultation
	The full PC Request documentation will be provided to Ngāti Te Ata following lodgement. The applicant is committed to ongoing consultation with Ngāti Tamaoho.
Te Ākitai Waiohua	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. On 22 March 2022, a site walkover meeting was held with Te Ākitai Waiohua's representative, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The full PC Request documentation will be provided to Te Ākitai Waiohua following lodgement. The applicant is committed to ongoing consultation with Te Ākitai Waiohua.
Ngāi Tai Ki Tāmaki	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. A meeting with Ngāi Tai Ki Tāmaki's representative was held on 3 December 2021, and he confirmed that a Cultural Values

Key stakeholder/ Organisation	Summary of Consultation
	Assessment is required. A Cultural Values Assessment was commissioned on 23 March 2022, however, it was not completed prior to the lodgement of the PC Request. The full PC Request documentation will be provided to Ngāi Tai Ki Tāmaki following lodgement. The applicant is committed to ongoing consultation with Ngāi Tai Ki Tāmaki.
Tāmaki Estuary Protection Society	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Tāmaki Estuary Protection Society on 21 March 2022. The following key matters were raised: • concerns regarding potential contaminants in the Tāmaki River and Ōtara Creek. • Concerns regarding effects of the PC on the roosting of the shorebirds. In response to the concerns raised, the Ecological Assessment Memo was updated to include consideration of effects on the coastal bird species using the weir at the mouth of the Ōtara Creek (where it flows into Tāmaki Riaver) for roosting. In response to the concerns regarding contamination matters, a Land Contamination Review Report was prepared to identify current or historical potential for contamination sources in the PC area.

Key stakeholder/ Organisation	Summary of Consultation
Greater East Tamaki Business Association (GETBA).	Letter provided with an overview of the Plan Change Request, including attachments of maps on 3 March 2022. A meeting was held with the representatives of the GETBA on 29 March 2022. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Requested that all existing cameras used for crime prevention adjacent to underpass remain. The information relating to the location of existing crossings was provided on 31 March 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Ōtara Waterways & Lake Trust	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Ōtara Waterways & Lake Trust on 4 April 2022. The following key matters were raised: • Concerns regarding existing signalised crossings and the new proposed access. • Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Concerns regarding the number of car parks and capacity within the development.

Key stakeholder/ Organisation	Summary of Consultation
	• Requested information on Mana Whenua groups being consulted. The information requested was provided on 20 April 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Goodman Property Trust (Goodman)	A meeting was held with the representatives of Goodman on 28 March 2022 to provide an overview of the PC Request. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Need to ensure that the proposed residential development is of a high quality noting its location at the entrance to Highbrook Business Park, an area of significant investment for Goodman. The ITA was provided to Goodman on 7 July 2022 for review by their independent specialists.
Ōtara-Papatoetoe Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 2 March 22. An overview of the PC was provided to the Ōtara - Papatoetoe Local board in their workshop meeting on 26 April 22. The Board as interested it the following key matters: • The type of housing to be developed.

Key stakeholder/ Organisation	Summary of Consultation
	• Interested to know whether there would be any social procurement schemes to allow public to participate in landscaping/ design or communal gardens. • Requested that the PC incorporate greenways in providing connectivity to the PC area. Ōtara-Papatoetoe Local Board will review the PC Request when lodged via the statutory process.
Howick Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 02 March 22. The Howick Local Board declined the request for a meeting, as comments of the Board are to be provided following the lodgement of the PC Request via the statutory process.
Waka Kotahi and AT	Multiple meetings have been held with Waka Kotahi and AT representatives to discuss the various aspects of the PC Request, including: • Need for future development within the PC area to secure access to Waka Kotahi's stormwater pond adjoining the PC area. The applicant agrees that this will be provided at the land development phase. • Noting the proximity to SH1 and Highbrook Drive, the PC should consider potential elevated noise environment and need for noise mitigation. The applicant agrees with this request, and has proposed noise mitigation measures in the PC Request. • Need for an ITA to assess traffic effects on the SH1 and Highbrook interchange and the other roads in the proximity of the PC area. The draft ITA was provided to

Key stakeholder/ Organisation	Summary of Consultation
	Waka Kotahi and AT for review prior to lodgement. Feedback received was incorporated into ITA submitted with the PC Request. The findings and recommendations of the ITA have been incorporated into the PC Request. • Need to illustrate that the current zoning of the site is unable to be utilised for its intended purposes.
Transpower New Zealand	A meeting with Transpower's representative was held on 3 September 2021. The key following matters were discussed: • There are no concerns in relation to the effects of the PC on the Ōtara Substation given the separation distance between the two. • Ensure that there is no development proposed underneath the National Grid infrastructure. • Ensure that the proposed development does not restrict access to the National Grid Tower beside the PC area. The applicant agrees that access to the Tower will be provided at the land development stage. The applicant is committed to consulting with Transpower at the land development phase.

10 CONCLUSIONS

10.1 This Statutory Assessment Report has been prepared in support of a Private Plan Change Request to the AUP(OP) on behalf of Highbrook Living Limited.

10.2 A section 32 evaluation has been completed, and it concludes that the Plan Change Request will more effectively and efficiently achieve the objectives of the AUP(OP), and the purpose of the RMA, than the current provisions sought to be amended. The section 32 evaluation will continue to be refined as the Plan Change Request progresses through the various processing stages.

10.3 It is recommended that the Council accept the Plan Change Request.

APPENDIX 1

RECORD OF TITLE

APPENDIX 1 – SUMMARY OF RECORD OF TITLE AND INTERESTS

The Record of Title for the subject site at 8 Sparky Road, Otara has been included within this Appendix as document NA137B/367.

In addition, the following Deposited Plans and Survey Office Plans relate to interests recorded on the Record of Title and have been included for reference purposes:

- DP 20962 relates to the rights created by Transfer D640353.5, Transfer 595037, Transfer D533860.5, Transfer D640353.10 and, Easement Certificate D640353.11
- DP 211681 relates to rights created by Transfer 5271467.1
- DP 420711 relates to rights created by Easement Instrument 8196392.3 and Easement Instrument 8196479.1
- SO Plan 403357 relates to rights created by Transfer D533860.6 and Transfer D640353.5
- SO Plan 406586 relates to rights created by Easement Instrument 8196392.3

Full copies of the following interests registered on the Record of Title have also been included:

- Transfer 91645
- Transfer 595037
- Transfer D533860.6
- Transfer D533860.5
- Transfer D640353.5
- Transfer D640353.10
- Easement Certificate D640353.11
- Transfer 5271467.1
- Compensation Certificate 6202531.1
- Easement 8196392.3
- Easement 8196479.1
- Encumbrance 10344615.1

Table 1. Summary of Interests Recorded on RT NA137B/367

	Interest	Comments
1	Water drainage right (in gross) over part marked A1, A2 and W4, created by Transfer 91645	Interest not applicable – located outside of Plan Change area (refer Deposited Plan 209362)
2	Electricity right (in gross) over part marked B and C on DP 209362, created by Transfer 595037	Not applicable – Located outside of Plan Change area (refer Deposited Plan 209362)
-	Excepting as to part all minerals pursuant to the Public Works Act 1928 on or under the land	Not applicable – Act has been replaced
-	Subject to Section 11 Crown Minerals Act 1991	Not applicable – Does not apply to Plan Change Request
-	Subject to Section 27B State-Owned Enterprises Act 1986 (which provides for the resumption of land on the recommendation of the Waitangi Tribunal and which does not provide for third parties, such as the owner of the land, to be heard in relation to the making of any such recommendation)	Not applicable – Land is not currently transferred or vested to a State enterprise
-	Subject to Section 3 Geothermal Energy Act 1953 Subject to Section 3 Petroleum Act 1937 Subject to Section 8 Atomic Energy Act 1945 Subject to Sections 5 and 261 Coal Mines Act 1979 Subject to Sections 6 and 8 Mining Act 1971	Not applicable – Acts have been replaced
3	Appurtenant hereto are Noise, vibration and emission rights created by Transfer D533860.6	Not Applicable – Located outside of Plan Change area (refer Schedule of Existing Easements/Interests to Remain with Land on Survey Office Plan 403357)
4	Appurtenant hereto is right of way and rights to drain sewage, drain waste water, convey water, and electricity, communications, gas and	Not applicable – Located outside of Plan Change area (refer Transfer D533860.5 and Deposited Plan 209362)

	liquid fuel rights created by Transfer D533860.5	
5	Appurtenant hereto is a right of way and rights to drain sewage and waste water, convey water, and electricity, communications, gas and liquid fuel rights created by Transfer D640353.5	Not applicable – Located outside of plan change area (refer Schedule of Existing Easements/Interests to Remain with Land on Survey Office Plan 403357)
6	Subject to a right of way and a right to convey water (in gross) over part marked H1, H2, V4, H4, V3 and V1 on Deposited Plan 209362 in favour of The Manukau City Council created by Transfer D640353.10	Not applicable – Located outside of plan change area (refer Deposited Plan 209362)
7	Appurtenant hereto is a stormwater drainage right specified in Easement Certificate D640353.11 Subject to a right of way and to water supply, sewerage and stormwater drainage, gas and electricity supply and telecommunications and liquid fuel supply rights over parts marked H1, H2, H3, H4 and V4 and to a stormwater drainage right over parts marked L, V1, V3, V4, K, J4, U1, Y, N1, J6, N2, P1, J2, P2, P4, J1 and Q and to telecommunications and electrical supply rights over parts marked W1, W3, W4 and W5 on DP 209362 specified in Easement Certificate D640353.11	**Applies** – Stormwater drainage easement over parts marked N1, J6 and N2 in plan change area (refer Deposited Plan 209362).
8	Subject to a right (in gross) to convey electricity over part herein marked B,C & D on DP 211681 in favour of Transpower New Zealand Limited created by Transfer 5271467.1	Not applicable – Located outside of plan change area (refer Deposited Plan 211681)
9	6202531.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981	The applicant will meet any relevant requirements set out in the Agreement for Sale of Land for Road and Compensation between

		Contact Energy Limited and Manukau City Council (dated 11 October 2004)
10	Appurtenant hereto is a right of way, water supply, sewage and stormwater drainage, and gas, electricity, telecommunications and liquid fuel supply created by Easement Instrument 8196392.3	Not applicable – Located outside of Plan Change area (refer Survey Office PLan 406586)
11	Appurtenant hereto is a right of way, water supply, sewage and stormwater drainage and gas, electricity, telecommunications and liquid fuel supply created by Easement Instrument 8196479.1	Not applicable – Located outside of Plan Change area (refer Deposited Plan 420711)
12	10344615.1 Encumbrance to Contact Energy Limited – includes two covenants: (1) preventing use of land for electricity generation activities; and (2) provides consent for registration of Auckland Transport instruments.	(1) Does not affect Plan Change Request as provision for electricity generation activities is not proposed. (2) The consent given by Contact Energy Limited for the registration of Auckland Transport instruments is considered separate to the Plan Change Request.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**NA137B/367**
Land Registration District	**North Auckland**
Date Issued	14 September 2001

Prior References
NA133B/132

Estate	Fee Simple
Area	35.0210 hectares more or less
Legal Description	Lot 2 Deposited Plan 209362
Registered Owners	

NZ Storage Holdings Limited

Interests

Subject to a water drainage right (in gross) over part marked A1, A2 and W4 in favour of East Tamaki Road District created by Transfer 91645

Subject to an electricity right (in gross) over part marked B and C on DP 209362 in favour of the Auckland Electric Power Board created by Transfer 595037

Excepting as to part all minerals pursuant to the Public Works Act 1928 on or under the land

Subject to Section 27B State-Owned Enterprises Act 1986 (which provides for the resumption of land on the recommendation of the Waitangi Tribunal and which does not provide for third parties, such as the owner of the land, to be heard in relation to the making of any such recommendation)

Subject to Section 11 Crown Minerals Act 1991

Subject to Section 3 Petroleum Act 1937

Subject to Section 8 Atomic Energy Act 1945

Subject to Section 3 Geothermal Energy Act 1953

Subject to Sections 6 and 8 Mining Act 1971

Subject to Sections 5 and 261 Coal Mines Act 1979

Appurtenant hereto is a right of way and rights to drain sewage, drain waste water, convey water, and electricity, communications, gas and liquid fuel rights created by Transfer D533860.5 - produced 21.8.2000 at 9.00 and entered 1.9.2000 at 9.00 am

Appurtenant hereto are noise, vibration and emission rights created by Transfer D533860.6 - produced 21.8.2000 at 9.00 and entered 1.9.2000 at 9.00 am

Appurtenant hereto is a right of way and rights to drain sewage and waste water, convey water, and electricity, communications, gas and liquid fuel rights created by Transfer D640353.5 - 14.9.2001 at 11.42 am

Subject to a right of way and a right to convey water (in gross) over part marked H1, H2, V4, H4, V3 and V1 on DP 209362 in favour of The Manukau City Council created by Transfer D640353.10 - 14.9.2001 at 11.42 am (Limited as to Duration)

The easements created by Transfer D640353.10 are subject to Section 243 (a) Resource Management Act 1991

Appurtenant hereto is a stormwater drainage right specified in Easement Certificate D640353.11 - 14.9.2001 at 11.42 am

Subject to a right of way and to water supply, sewerage and stormwater drainage, gas and electricity supply and telecommunications and liquid fuel supply rights over parts marked H1, H2, H3, H4 and V4 and to a stormwater drainage right over parts marked L, V1, V3, V4, K, J4, U1, Y, N1, J6, N2, P1, J2, P2, P4, J1 and Q and to telecommunications and electrical supply rights over parts marked W1, W3, W4 and W5 on DP 209362 specified in Easement Certificate D640353.11 - 14.9.2001 at 11.42 am

Some of the easements specified in Easement Certificate D640353.11 are subject to Section 243 (a) Resource Management Act 1991

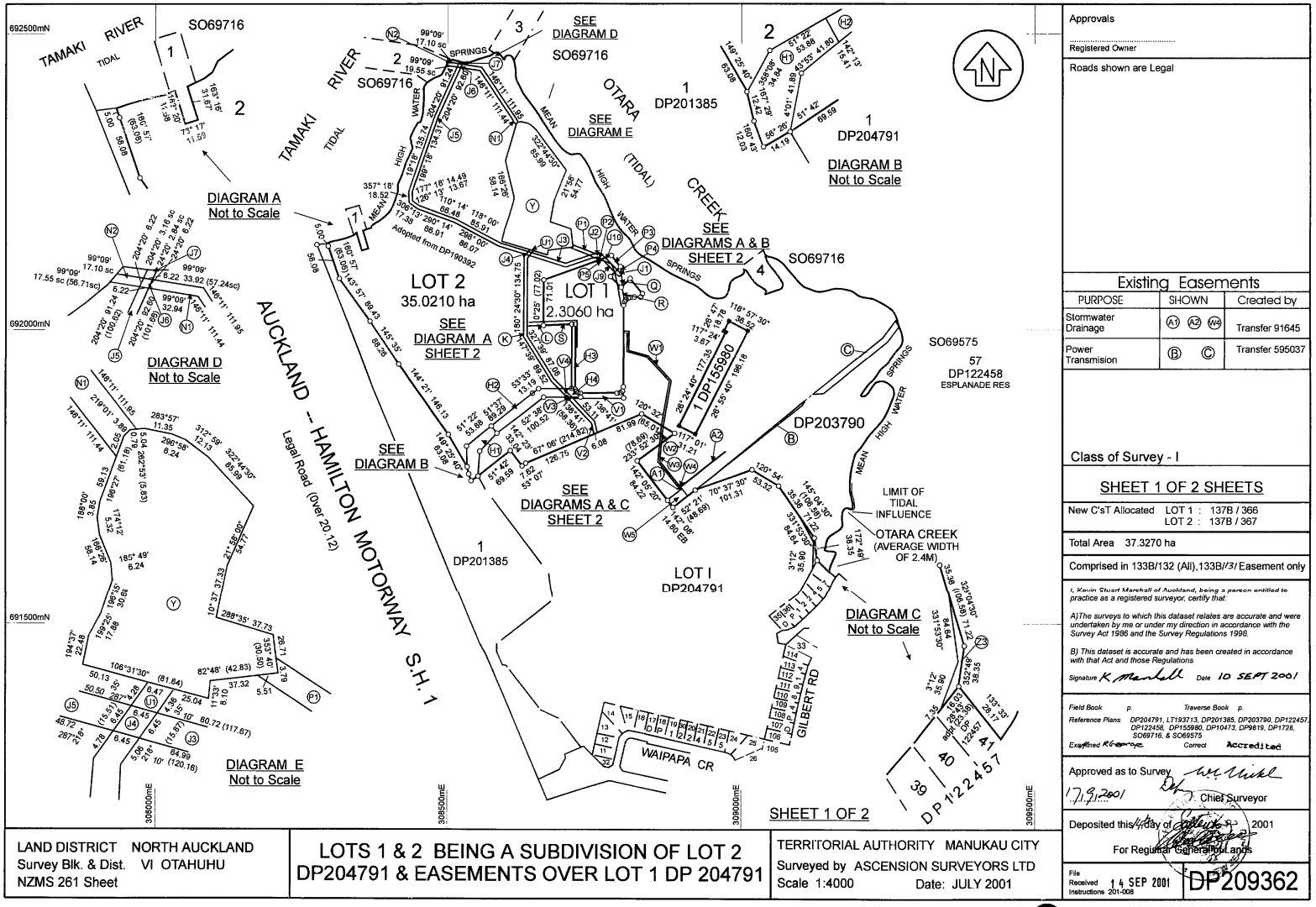
Subject to a right (in gross) to convey electricity over part herein marked B,C & D on DP 211681 in favour of Transpower New Zealand Limited created by Transfer 5271467.1 - 4.7.2002 at 9:00 am

6202531.1 Compensation Certificate pursuant to Section 19 Public Works Act 1981 - 3.11.2004 at 9:00 am

Appurtenant hereto is a right of way, water supply, sewage and stormwater drainage, and gas, electricity, telecommunications and liquid fuel supply created by Easement Instrument 8196392.3 - 30.10.2009 at 3:11 pm

Appurtenant hereto is a right of way, water supply, sewage and stormwater drainage and gas, electricity, telecommunications and liquid fuel supply created by Easement Instrument 8196479.1 - 30.10.2009 at 3:12 pm

10344615.1 Encumbrance to Contact Energy Limited - 26.2.2016 at 11:16 am



Approvals

Registered Owner

Roads shown are Legal

Existing Easements

PURPOSE	SHOWN	Created by
Stormwater Drainage	A1 A2 W4	Transfer 91645
Power Transmision	B C	Transfer 595037

Class of Survey - I

SHEET 1 OF 2 SHEETS

New C'sT Allocated LOT 1 : 137B / 366
LOT 2 : 137B / 367

Total Area 37.3270 ha

Comprised in 133B/132 (All),133B/373 Easement only

I, Kevin Stuart Marshall of Auckland, being a person entitled to practice as a registered surveyor, certify that:

A) The surveys to which this dataset relates are accurate and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1996.

B) This dataset is accurate and has been created in accordance with that Act and those Regulations

Signature K Marshall Date 10 SEPT 2001

Field Book p. Traverse Book p.

Reference Plans DP204791, LT193713, DP201385, DP203790, DP122457, DP122458, DP155980, DP10473, DP9819, DP1728, SO69716, & SO69575

Examined Reporter Correct Accredited

Approved as to Survey 17.9.2001 Chief Surveyor

Deposited this 1/4 day of October 2001

For Registrar General of Lands

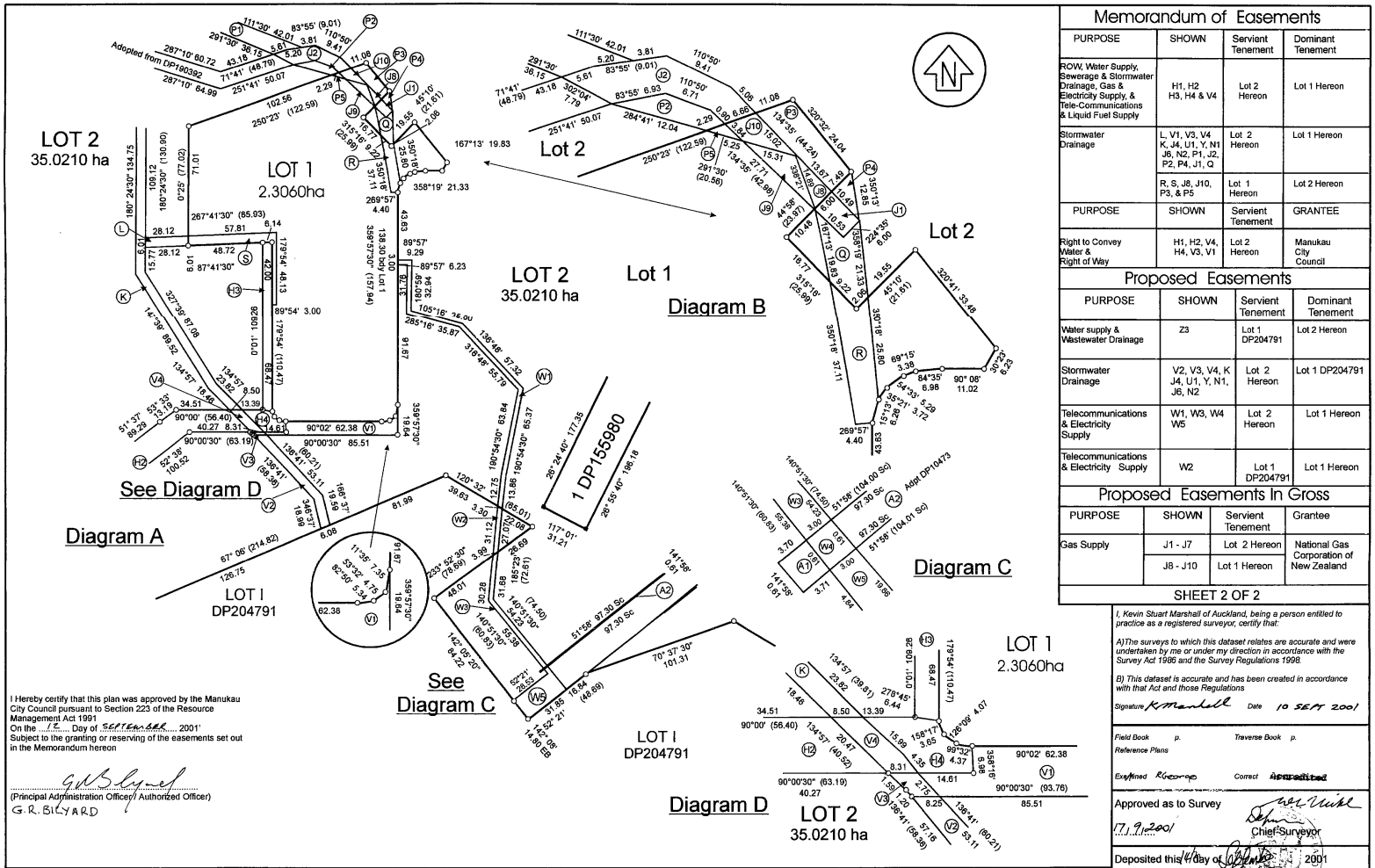
File Received 14 SEP 2001 Instructions 201-008

DP209362

LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist. VI OTAHUHU
NZMS 261 Sheet

LOTS 1 & 2 BEING A SUBDIVISION OF LOT 2 DP204791 & EASEMENTS OVER LOT 1 DP 204791

TERRITORIAL AUTHORITY MANUKAU CITY
Surveyed by ASCENSION SURVEYORS LTD
Scale 1:4000 Date: JULY 2001



Memorandum of Easements

PURPOSE	SHOWN	Servient Tenement	Dominant Tenement
ROW, Water Supply, Sewerage & Stormwater Drainage, Gas & Electricity Supply, & Tele-Communications & Liquid Fuel Supply	H1, H2 H3, H4 & V4	Lot 2 Hereon	Lot 1 Hereon
Stormwater Drainage	L, V1, V3, V4 K, J4, U1, Y, N1 J6, N2, P1, J2, P2, P4, J1, Q	Lot 2 Hereon	Lot 1 Hereon
	R, S, J8, J10, P3, & P5	Lot 1 Hereon	Lot 2 Hereon
PURPOSE	SHOWN	Servient Tenement	GRANTEE
Right to Convey Water & Right of Way	H1, H2, V4, H4, V3, V1	Lot 2 Hereon	Manukau City Council

Proposed Easements

PURPOSE	SHOWN	Servient Tenement	Dominant Tenement
Water supply & Wastewater Drainage	Z3	Lot 1 DP204791	Lot 2 Hereon
Stormwater Drainage	V2, V3, V4, K J4, U1, Y, N1, J6, N2	Lot 2 Hereon	Lot 1 DP204791
Telecommunications & Electricity Supply	W1, W3, W4 W5	Lot 2 Hereon	Lot 1 Hereon
Telecommunications & Electricity Supply	W2	Lot 1 DP204791	Lot 1 Hereon

Proposed Easements In Gross

PURPOSE	SHOWN	Servient Tenement	Grantee
Gas Supply	J1 - J7	Lot 2 Hereon	National Gas Corporation of New Zealand
	J8 - J10	Lot 1 Hereon	

SHEET 2 OF 2

I Hereby certify that this plan was approved by the Manukau City Council pursuant to Section 223 of the Resource Management Act 1991
On the 12 Day of SEPTEMBER 2001
Subject to the granting or reserving of the easements set out in the Memorandum hereon

(Principal Administration Officer/ Authorized Officer)
G.R. BILYARD

I, Kevin Stuart Marshall of Auckland, being a person entitled to practice as a registered surveyor, certify that:

A) The surveys to which this dataset relates are accurate and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1998.

B) This dataset is accurate and has been created in accordance with that Act and those Regulations

Signature K Marshall Date 10 SEPT 2001

Field Book p. Traverse Book p.
Reference Plans
Examined R George Correct Accredited

Approved as to Survey
17.9.2001
Chief Surveyor

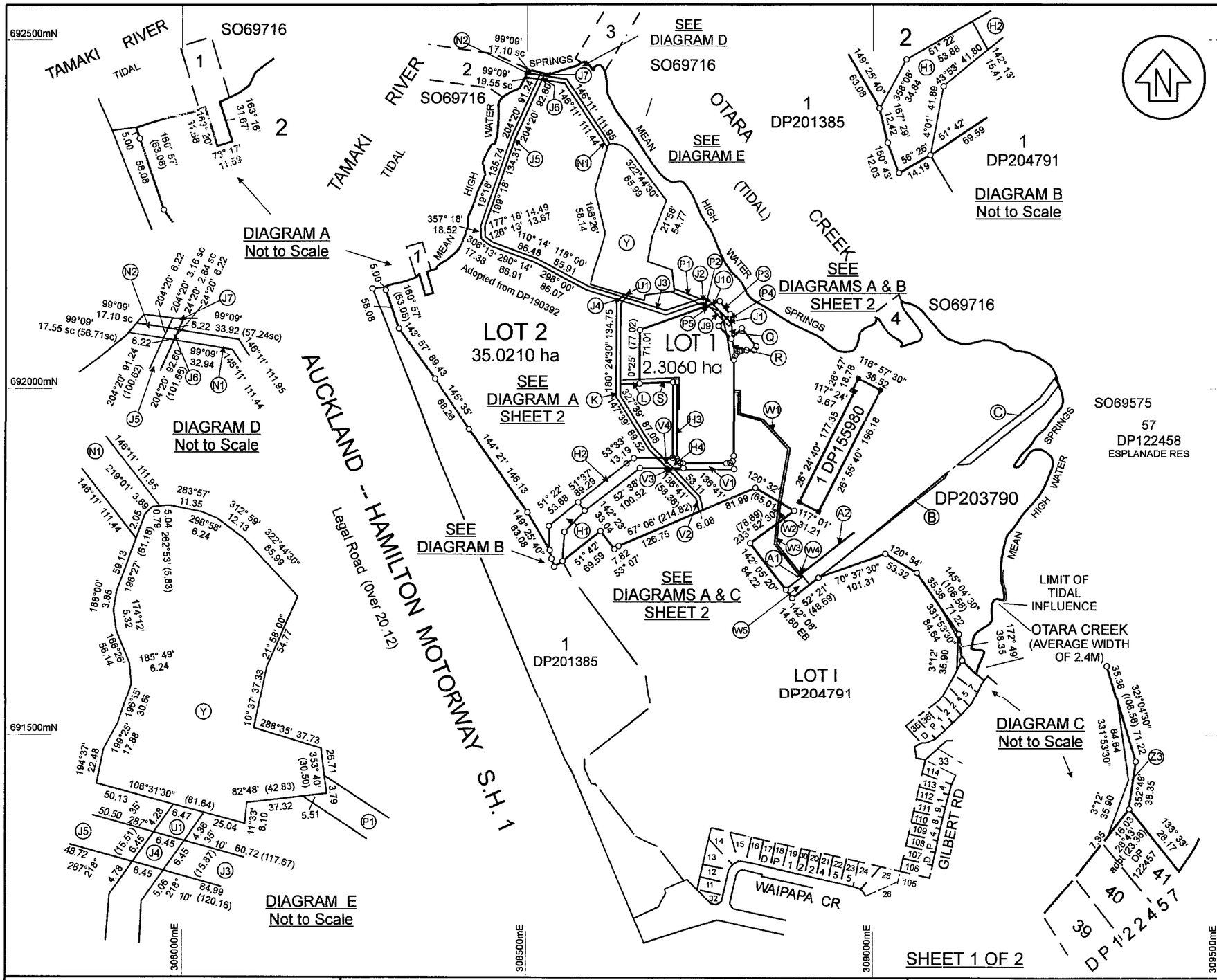
Deposited this 14 day of SEPTEMBER 2001
For Registrar-General of Lands

File Received 14 SEP 2001
Instructions 201-008

DP209362

LAND DISTRICT NORTH AUCKLAND Survey Blk. & Dist. VI OTAHUHU NZMS 261 Sheet	LOTS 1 & 2 BEING A SUBDIVISION OF LOT 2 DP204791 & EASEMENTS OVER LOT 1 DP204791	TERRITORIAL AUTHORITY MANUKAU CITY Surveyed by ASCENSION SURVEYORS LTD Diagrams Not to Scale Date: JULY 2001

SP. 7299 P. 19276 Otahuhu Pow... Stat... Fen... Ot...



Approvals	
Registered Owner	
Roads shown are Legal	

Existing Easements

PURPOSE	SHOWN	Created by
Stormwater Drainage	A1 A2 W4	Transfer 91645
Power Transmision	B C	Transfer 595037

Class of Survey - I

SHEET 1 OF 2 SHEETS

New C'sT Allocated LOT 1 : 137B / 366
LOT 2 : 137B / 367

Total Area 37.3270 ha

Comprised in 133B/132 (All),133B/*3*/ Easement only

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A)The surveys to which this dataset relates are accurate and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1998.

B) This dataset is accurate and has been created in accordance with that Act and those Regulations

Signature K Marshall Date 10 SEPT 2001

Field Book p. Traverse Book p.

Reference Plans DP204791, LT193713, DP201385, DP203790, DP122457, DP122458, DP155980, DP10473, DP9819, DP1728, SO69716, & SO69575

Examined RGeorge Correct Accredited

Approved as to Survey 17.9.2001

Chief Surveyor

Deposited this 14th day of September 2001

For Registrar General of Lands

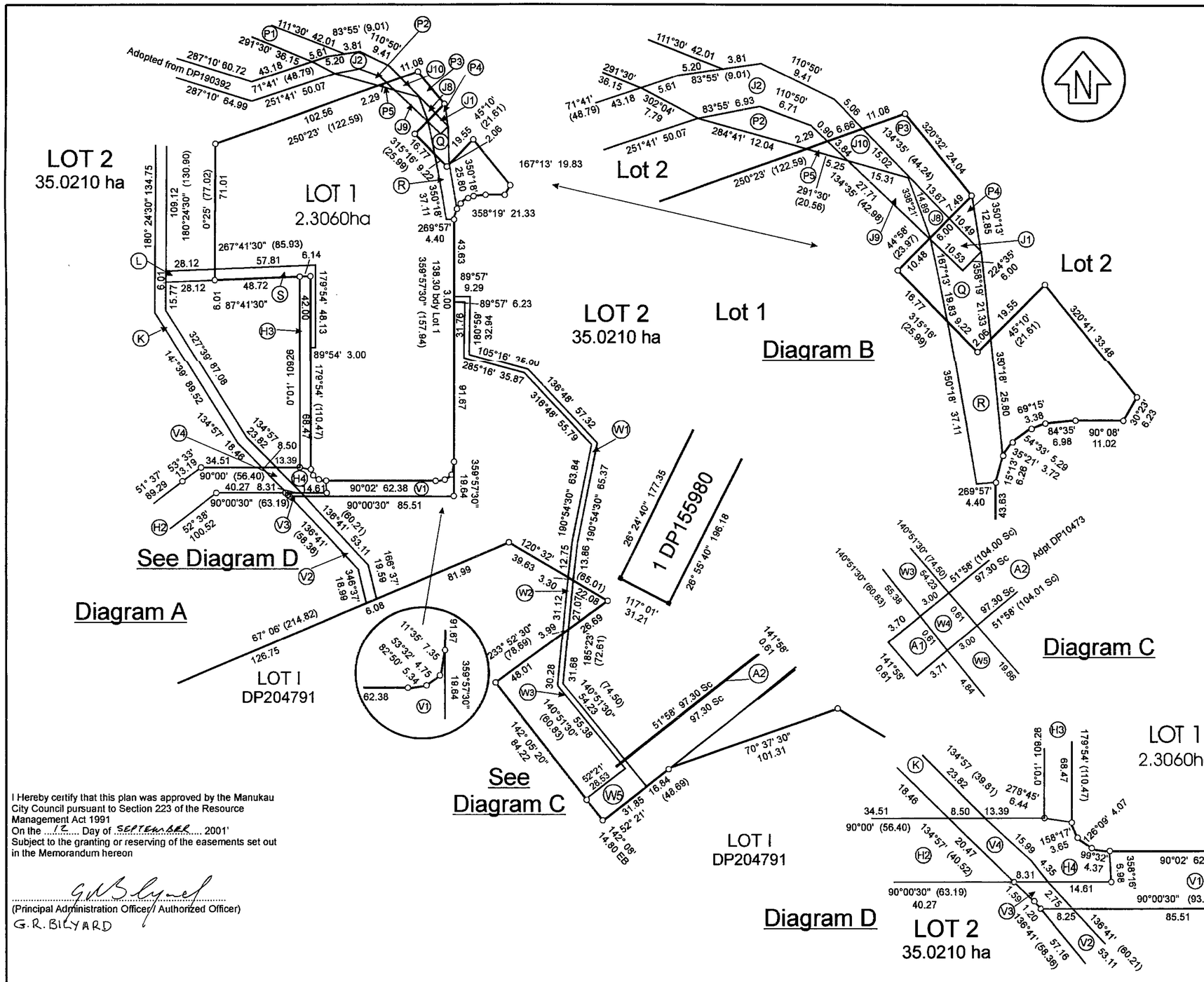
File
Received 14 SEP 2001
Instructions 201-008

DP209362

LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist. VI OTAHUHU
NZMS 261 Sheet

LOTS 1 & 2 BEING A SUBDIVISION OF LOT 2 DP204791 & EASEMENTS OVER LOT 1 DP 204791

TERRITORIAL AUTHORITY MANUKAU CITY
Surveyed by ASCENSION SURVEYORS LTD
Scale 1:4000 Date: JULY 2001



Memorandum of Easements

PURPOSE	SHOWN	Servient Tenement	Dominant Tenement
ROW, Water Supply, Sewerage & Stormwater Drainage, Gas & Electricity Supply, & Tele-Communications & Liquid Fuel Supply	H1, H2 H3, H4 & V4	Lot 2 Hereon	Lot 1 Hereon
Stormwater Drainage	L, V1, V3, V4 K, J4, U1, Y, N1 J6, N2, P1, J2, P2, P4, J1, Q	Lot 2 Hereon	Lot 1 Hereon
	R, S, J8, J10, P3, & P5	Lot 1 Hereon	Lot 2 Hereon
PURPOSE	SHOWN	Servient Tenement	GRANTEE
Right to Convey Water & Right of Way	H1, H2, V4, H4, V3, V1	Lot 2 Hereon	Manukau City Council

Proposed Easements

PURPOSE	SHOWN	Servient Tenement	Dominant Tenement
Water supply & Wastewater Drainage	Z3	Lot 1 DP204791	Lot 2 Hereon
Stormwater Drainage	V2, V3, V4, K J4, U1, Y, N1, J6, N2	Lot 2 Hereon	Lot 1 DP204791
Telecommunications & Electricity Supply	W1, W3, W4 W5	Lot 2 Hereon	Lot 1 Hereon
Telecommunications & Electricity Supply	W2	Lot 1 DP204791	Lot 1 Hereon

Proposed Easements In Gross

PURPOSE	SHOWN	Servient Tenement	Grantee
Gas Supply	J1 - J7	Lot 2 Hereon	National Gas Corporation of New Zealand
	J8 - J10	Lot 1 Hereon	

SHEET 2 OF 2

I, Kevin Stuart Marshall of Auckland, being a person entitled to practice as a registered surveyor, certify that:

A)The surveys to which this dataset relates are accurate and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1998.

B) This dataset is accurate and has been created in accordance with that Act and those Regulations

Signature K Marshall *Date* 10 SEPT 2001

Field Book p. *Traverse Book* p.

Reference Plans

Examined R George *Correct* Approved

Approved as to Survey

17/9/2001

Chief Surveyor

Deposited this 14th day of SEPTEMBER 2001

For Registrar-General of Lands

File
Received 14 SEP 2001
Instructions 201-008

DP209362

I Hereby certify that this plan was approved by the Manukau City Council pursuant to Section 223 of the Resource Management Act 1991
On the 12 Day of SEPTEMBER 2001
Subject to the granting or reserving of the easements set out in the Memorandum hereon

G.R. Bilyard
(Principal Administration Officer/ Authorized Officer)
G.R. BILYARD

LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist. VI OTAHUHU
NZMS 261 Sheet

LOTS 1 & 2 BEING A SUBDIVISION OF LOT 2 DP204791 & EASEMENTS OVER LOT 1 DP204791

TERRITORIAL AUTHORITY MANUKAU CITY
Surveyed by ASCENSION SURVEYORS LTD
Diagrams Not to Scale Date: JULY 2001

SP. 7299 P. 19276 Otahuhu Pow... Stat... Fa... Rd Otara

308700 mE | 308780 mE | 308860 mE

692000 mN | 691920 mN | 691840 mN

1
DP209362
C.T.137B/366

2
DP209362
C.T.137B/367

DP209362 ADPT ORIGIN

91°36' 23.02EB
4.32EB (14.98) (4.91)
34.85EB
131°29' 27.00EB
(27.00)
41°29' 43.13EB
41°29' 14.32EB
10.66EB 182°55'
199°57' 10.36EB
109°59' 13.23EB
359°57' 65.63EB
63.07EB
202°13' 52.43EB
16°16' 178.12EB
269°50' 13.80EB
359°52' 71.76EB
74°47' 7.38EB
8.98EB 319°56'
2.92EB (3.72)
359°57'30" (138.30) ADPT DP209362 111.17 BAL
(205.16) 41.32EB
(27.00)
16°16' 39.41EB
27.13EB
62.36EB
(27.00)
29.81 BAL
34.82 EB 67°06' (214.82) ADPT DP193713
150.19 BAL

SEE DIAGRAM

90°02' (62.38) ADPT DP209362
61.92 BAL

1
DP204791

COMPUTED PLAN

DIAGRAM NOT TO SCALE

1
DP209362
C.T.137B/366

2
DP209362
C.T.137B/367

16°16' (205.16) 39.41EB
27.13EB 359°57'30" (138.30) ADPT DP209362
11°35' 7.35 ADPT DP209362
53°32' 4.75 ADPT DP209362
82°50' 5.34 ADPT DP209362
0.46EB
90°02' (62.38) ADPT DP209362
61.92 BAL
62.36EB

Approvals REGISTERED OWNERS

CONTACT ENERGY LIMITED
C.T.137B/366 & C.T.137B/367

PROPOSED EASEMENTS IN GROSS

PURPOSE	SERVIENT TENEMENT	SHOWN	GRANTEE
RIGHT TO CONVEY ELECTRICITY	LOT 1 DP209362 C.T.137B/366	(A)	TRANSPOWER NEW ZEALAND LTD
	LOT 2 DP209362 C.T.137B/367	(B) (C) (D)	

ALL BEARINGS AND DISTANCES ARE CALCULATED UNLESS OTHERWISE SHOWN

COORDINATES

MARK	mN	mE
DP209362 ADPT (SOURCE DP209362)	692041.09	308800.15

CLASS OF SURVEY
EASEMENTS 'A', 'B', 'C' & 'D' = CLASS I

BEARING AND COORDINATE DATUM
- GEODETIC 1949
MT EDEN CIRCUIT COORDINATES
ORIGIN MT EDEN - 700000mN
- 300000mE

Total Area

Comprised in C.T.137B/366 (EASEMENT ONLY)
C.T.137B/367 (EASEMENT ONLY)

I JOHN MELVILLE GASSON OF PUKEKOHE
being a person entitled to practise as a Registered Surveyor, certify that –
(a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Survey Act 1986 and the Survey Regulations 1998.
(b) This dataset is accurate, and has been created in accordance with that Act and those Regulations.
Dated at PUKEKOHE this 26th day of March 2002
Signature

Field Book p Traverse Book 2013 p 82-83
Reference Plans DP209362, DP193713, DP203790, DP204791

Examined Correct Accredited

Approved as to Survey
11/4/2002
Chief Surveyor

Deposited this 12th day of April 2002
Registrar-General Of Land

File
Received Instructions 27 MAR 2002

DP211681

LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist.
NZMS 261 Sheet Record Map No.

EASEMENTS OVER LOTS 1 & 2 DP209362

TERRITORIAL AUTHORITY MANUKAU CITY COUNCIL
Surveyed by THE SURVEYING COMPANY
Scale 1:800 Date NOVEMBER 2001

219205

Approved AKLM/07/06

Digital Title Plan - DP 420711

Survey Number	DP 420711
Surveyor Reference	86449 GHD
Surveyor	Gary Jackson Blyth
Survey Firm	Fraser Thomas Ltd (Auckland)
Surveyor Declaration	I Gary Jackson Blyth, being a person entitled to practise as a licensed cadastral surveyor, certify that - (a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2; (b) This dataset is accurate, and has been created in accordance with that Act and those Rules. Declared on 16/06/2009.

Survey Details

Dataset Description	PLAN OF EASEMENT OVER LOT 1 DP 204791		
Status	Deposited		
Land District	North Auckland	**Survey Class**	Class I Cadastral Survey
Submitted Date	16/06/2009	**Survey Approval Date**	19/06/2009
		Deposit Date	30/10/2009

Territorial Authorities

Manukau City

Comprised In

CT NA133B/131

Created Parcels

Parcels	Parcel Intent	Area	CT Reference
Easement G Deposited Plan 420711	Easement		
Total Area		0.0000 Ha	

Fraser Thomas

- CONSULTING ENGINEERS
- RESOURCE MANAGERS
- ENVIRONMENTAL CONSULTANTS
- SURVEYORS & PLANNERS

FRASER THOMAS LIMITED
152 KOLMAR ROAD, PAPATOETOE
P.O. BOX 23 273, HUNTERS CORNER
AUCKLAND 2155, NEW ZEALAND
PHONE: +64 9 278 7078
FAX: +64 9 278 3697
www.fraserthomas.co.nz

Land Registration District

North Auckland

Plan Number

LT 420711

Territorial Authority (the Council)

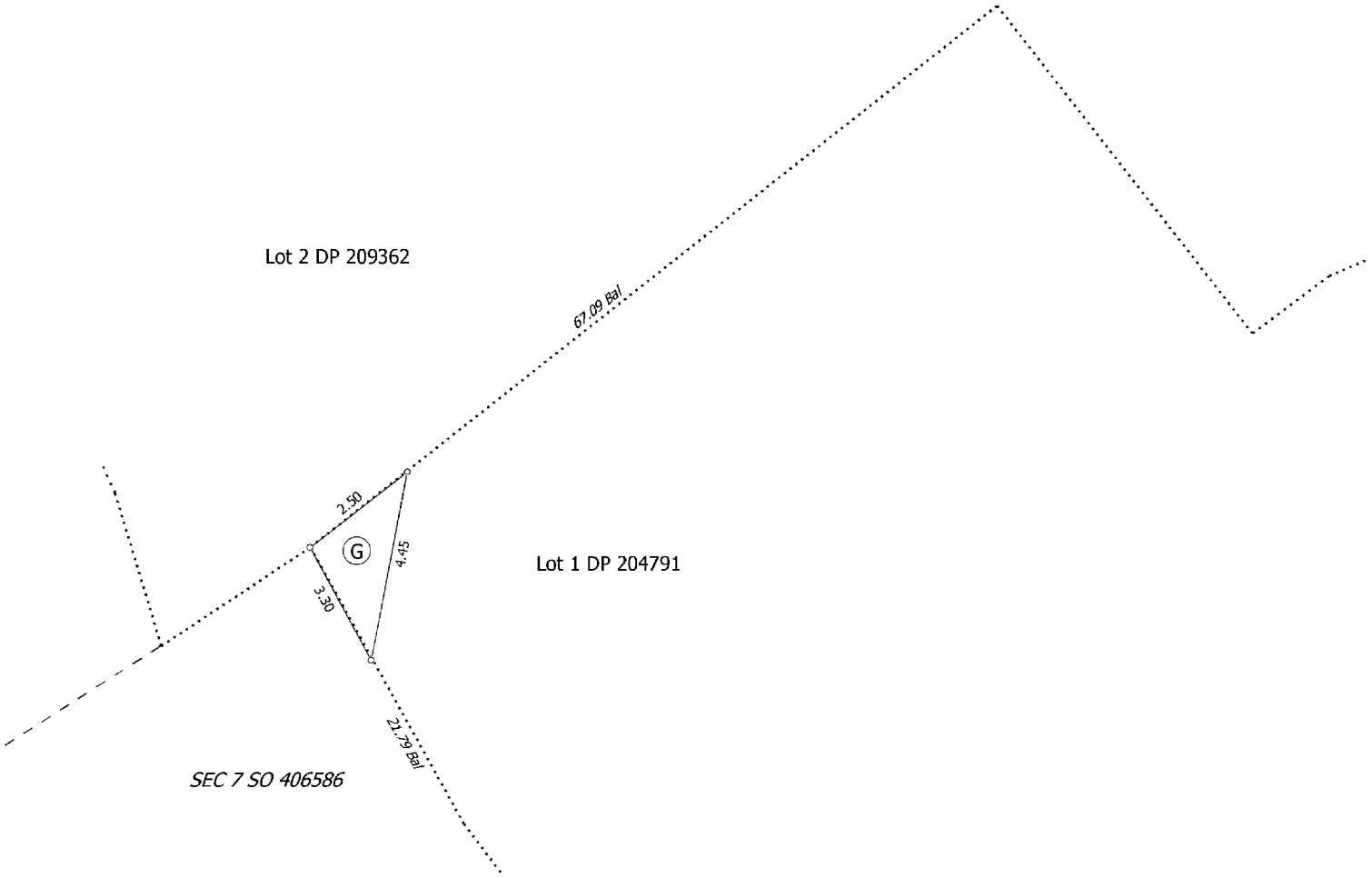
MANUKAU CITY COUNCIL

Proposed Easements			
Purpose	**Shown**	**Servient Tenement**	**Dominant Tenement**
Right of way, water supply, sewerage & stormwater drainage and gas, electricity, telecommunications & liquid fuel supply	G	Lot 1 DP 204791	Lots 1 & 2 DP 209362, Section 7 SO 406586, Lot 1 DP 155980 & Sections 1 – 4 SO 69716

Proposed Easements in Gross			
Purpose	**Shown**	**Servient Tenement**	**Grantee**
Right of way	G	Lot 1 DP 204791	Manukau City Council

Schedule of Existing Easements/ Interests to Remain with Land (Pursuant to s239(2) of the Resource Management Act 1991)		
Purpose/Interest	**Shown/Document Number**	**Created By**
Right of Way, Right to Drain Sewage and Waste Water and Right to Convey Water, Electricity, Communications, Gas and Liquid Fuel	D DP 204791	D640353.5

Diag. A
Non Primary



T 1/1

Land District: North Auckland Digitally Generated Plan Generated on: 11/11/2009 10:54am Page 3 of 3	PLAN OF EASEMENT OVER LOT 1 DP 204791	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Digital Title Plan DP 420711 Deposited on: 30/10/2009

Title Plan - SO 403357

Survey Number	SO 403357
Surveyor Reference	86449 Contact legalisation
Surveyor	Gary Jackson Blyth
Survey Firm	Fraser Thomas Ltd (Auckland)
Surveyor Declaration	I Gary Jackson Blyth, being a licensed cadastral surveyor, certify that: (a) this dataset provided by me and its related survey are accurate, correct and in accordance with the Cadastral Survey Act 2002 and the Rules for Cadastral Survey 2010, and (b)the survey was undertaken by me or under my personal direction. Declared on 02 Oct 2014 09:15 AM

Survey Details

Dataset Description	SECTIONS 1 - 6, 8 and 10 - 39		
Status	Approved as to Survey		
Land District	North Auckland	**Survey Class**	Class A
Submitted Date	02/10/2014	**Survey Approval Date**	06/10/2014
		Deposit Date	

Territorial Authorities

Auckland

Comprised In

CT NA137B/367
CT NA125B/883
CT NA133B/131
CT NA130A/437

Created Parcels

Parcels	Parcel Intent	Area	CT Reference
Section 34 Survey Office Plan 403357	Strata		
Area BB Survey Office Plan 403357	Easement		
Area C Survey Office Plan 403357	Easement		
Area M Survey Office Plan 403357	Easement		
Area N Survey Office Plan 403357	Easement		
Area O Survey Office Plan 403357	Easement		
Area E Survey Office Plan 403357	Easement		
Section 16 Survey Office Plan 403357	Strata		
Section 17 Survey Office Plan 403357	Strata		
Section 18 Survey Office Plan 403357	Strata		
Section 19 Survey Office Plan 403357	Strata		
Section 20 Survey Office Plan 403357	Strata		
Section 21 Survey Office Plan 403357	Strata		
Section 22 Survey Office Plan 403357	Strata		
Section 23 Survey Office Plan 403357	Strata		
Section 24 Survey Office Plan 403357	Strata		
Section 25 Survey Office Plan 403357	Strata		

Title Plan - SO 403357

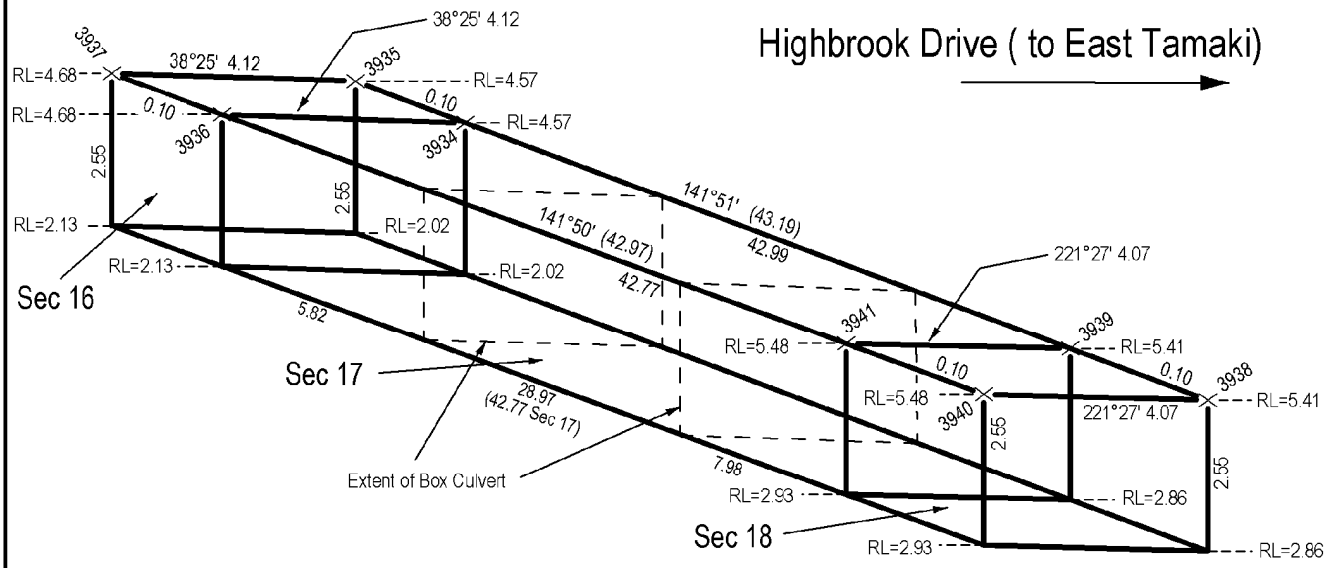
Created Parcels

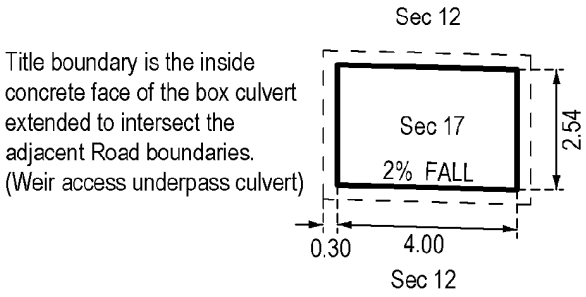
Parcels	Parcel Intent	Area	CT Reference
Section 26 Survey Office Plan 403357	Strata		
Area R Survey Office Plan 403357	Easement		
Area S Survey Office Plan 403357	Easement		
Area T Survey Office Plan 403357	Easement		
Section 27 Survey Office Plan 403357	Strata		
Area U Survey Office Plan 403357	Easement		
Section 1 Survey Office Plan 403357	Legalisation	0.6244 Ha	
Section 2 Survey Office Plan 403357	Legalisation	0.5500 Ha	
Section 3 Survey Office Plan 403357	Legalisation	0.0101 Ha	
Section 4 Survey Office Plan 403357	Legalisation	0.0050 Ha	
Section 5 Survey Office Plan 403357	Legalisation	0.0099 Ha	
Section 6 Survey Office Plan 403357	Legalisation	0.9884 Ha	
Section 8 Survey Office Plan 403357	Legalisation	0.7553 Ha	
Section 10 Survey Office Plan 403357	Legalisation	0.0946 Ha	
Section 11 Survey Office Plan 403357	Legalisation	0.3058 Ha	
Section 12 Survey Office Plan 403357	Legalisation	3.4393 Ha	
Section 13 Survey Office Plan 403357	Legalisation	0.0057 Ha	
Section 14 Survey Office Plan 403357	Legalisation	0.0073 Ha	
Section 15 Survey Office Plan 403357	Strata		
Area K Survey Office Plan 403357	Easement		
Area L Survey Office Plan 403357	Easement		
Area Q Survey Office Plan 403357	Easement		
Area V Survey Office Plan 403357	Easement		
Area W Survey Office Plan 403357	Easement		
Area X Survey Office Plan 403357	Easement		
Area Z Survey Office Plan 403357	Easement		
Area P Survey Office Plan 403357	Easement		
Area AA Survey Office Plan 403357	Easement		
Area AB Survey Office Plan 403357	Easement		
Area AC Survey Office Plan 403357	Easement		
Area AD Survey Office Plan 403357	Easement		
Area Y Survey Office Plan 403357	Easement		
Area AE Survey Office Plan 403357	Easement		
Area AF Survey Office Plan 403357	Easement		
Area AG Survey Office Plan 403357	Easement		
Area AH Survey Office Plan 403357	Easement		
Area A Survey Office Plan 403357	Easement		
Area AI Survey Office Plan 403357	Easement		
Area AJ Survey Office Plan 403357	Easement		
Area AK Survey Office Plan 403357	Easement		
Area AL Survey Office Plan 403357	Easement		
Area AM Survey Office Plan 403357	Easement		
Area AN Survey Office Plan 403357	Easement		
Area AO Survey Office Plan 403357	Easement		

Title Plan - SO 403357

Created Parcels

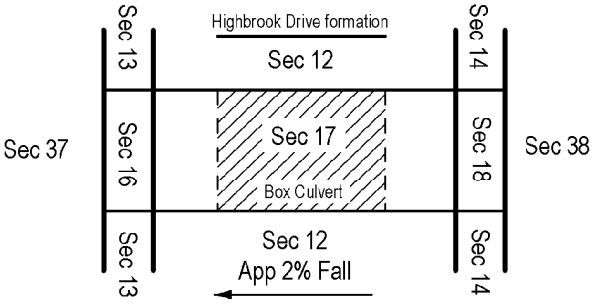
Parcels	Parcel Intent	Area	CT Reference
Area AP Survey Office Plan 403357	Easement		
Area AQ Survey Office Plan 403357	Easement		
Area AR Survey Office Plan 403357	Easement		
Area AS Survey Office Plan 403357	Easement		
Area AT Survey Office Plan 403357	Easement		
Area AU Survey Office Plan 403357	Easement		
Section 35 Survey Office Plan 403357	Strata		
Area D Survey Office Plan 403357	Easement		
Section 36 Survey Office Plan 403357	Fee Simple Title	0.8454 Ha	
Area B Survey Office Plan 403357	Easement		
Section 39 Survey Office Plan 403357	Fee Simple Title	20.4840 Ha	
Section 37 Survey Office Plan 403357	Fee Simple Title	4.0317 Ha	
Section 28 Survey Office Plan 403357	Legalisation	0.0001 Ha	
Section 38 Survey Office Plan 403357	Fee Simple Title	27.2452 Ha	
Area AV Survey Office Plan 403357	Easement		
Section 29 Survey Office Plan 403357	Legalisation	0.0003 Ha	
Section 30 Survey Office Plan 403357	Legalisation	0.0007 Ha	
Section 31 Survey Office Plan 403357	Legalisation	0.0003 Ha	
Section 32 Survey Office Plan 403357	Legalisation	0.0004 Ha	
Section 33 Survey Office Plan 403357	Legalisation	0.0004 Ha	
Area F Survey Office Plan 403357	Easement		
Area G Survey Office Plan 403357	Easement		
Area H Survey Office Plan 403357	Easement		
Area AW Survey Office Plan 403357	Easement		
Area AX Survey Office Plan 403357	Easement		
Area AY Survey Office Plan 403357	Easement		
Area AZ Survey Office Plan 403357	Easement		
Area I Survey Office Plan 403357	Easement		
Area BA Survey Office Plan 403357	Easement		
Area J Survey Office Plan 403357	Easement		
Lot 1 Deposited Plan 209362	Fee Simple Title	2.3060 Ha	
Lot 1 Deposited Plan 155980	Fee Simple Title	0.6363 Ha	
Total Area		62.3466 Ha	





Title boundary is the inside concrete face of the box culvert extended to intersect the adjacent Road boundaries. (Weir access underpass culvert)

Typical Cross Section



Typical Long Section

Notes:

1, × indicates the Landonline point and the number adjacent is the Landonline reference.
2, See LOL Title Plan sheets 4 & 6 for Section 16 - 18 locations
3, Dimensions shown are plan view dimensions
4, Heights are in term of LINZ Mean Sea Level Datum 1946
Origin of levels : RM 4887 SO 55767
RL= 14.09m

SO 403357

Fraser Thomas
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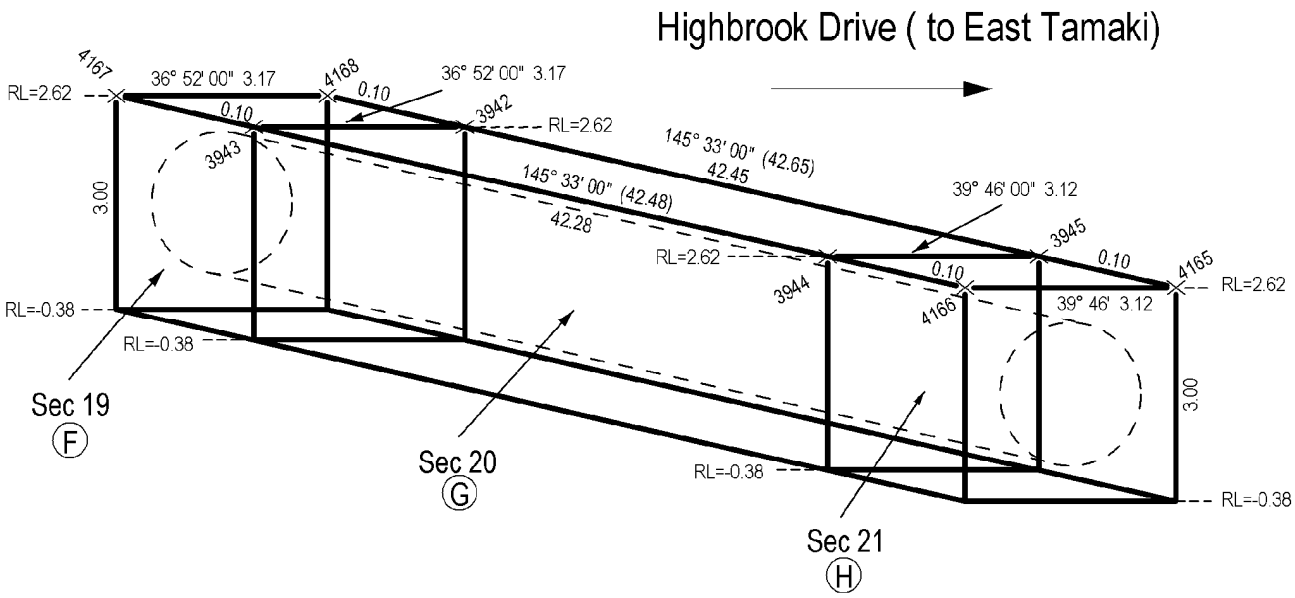
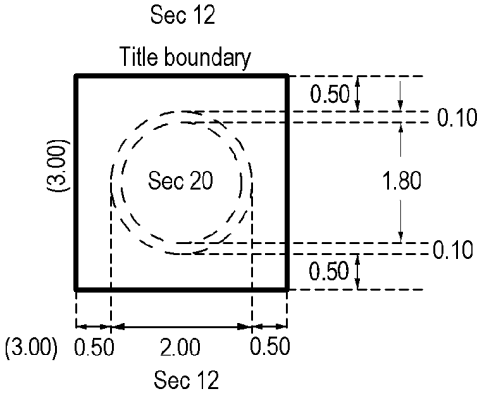
PLAN OF SECTIONS 16 - 18 ON SECTIONS 12 - 14 SO 403357

HIGHBROOK DRIVE, EAST TAMAKI

SCALE: (A4)	REVISION
NOT TO SCALE	B

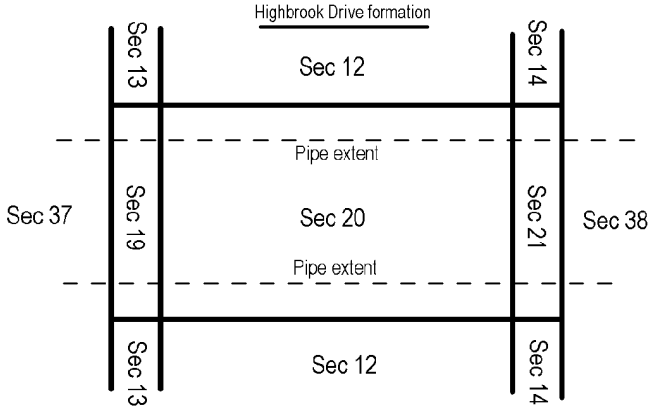
SURVEYED	FF	06/03/08
DRAWN	CK	03/04/08
CAD FILE No.	P:\86 Series\86449\ 86449 Ease Diag - EB 1 Rev A-u	
DRAWING NUMBER	86449/EB1	





Typical Cross Section

(Cooling pond outflow pipe)



Typical Long Section

Notes:

1, × indicates the Landonline point and the number adjacent is the Landonline reference.
2, See LOL Title Plan sheets 4 & 6 for Section 19 - 21 locations
3, Dimensions shown are plan view dimensions
4, Heights are in term of LINZ Mean Sea Level Datum 1946
Origin of levels : RM 4887 SO 55767
RL= 14.09m

SO 403357

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PLAN OF SECTIONS 19 - 21 ON SECTIONS 12 - 14 SO 403357

HIGHBROOK DRIVE, EAST TAMAKI

SCALE (A4)		REVISION
NOT TO SCALE		B
SURVEYED	FF	23/05/05
DRAWN	CK	02/04/08
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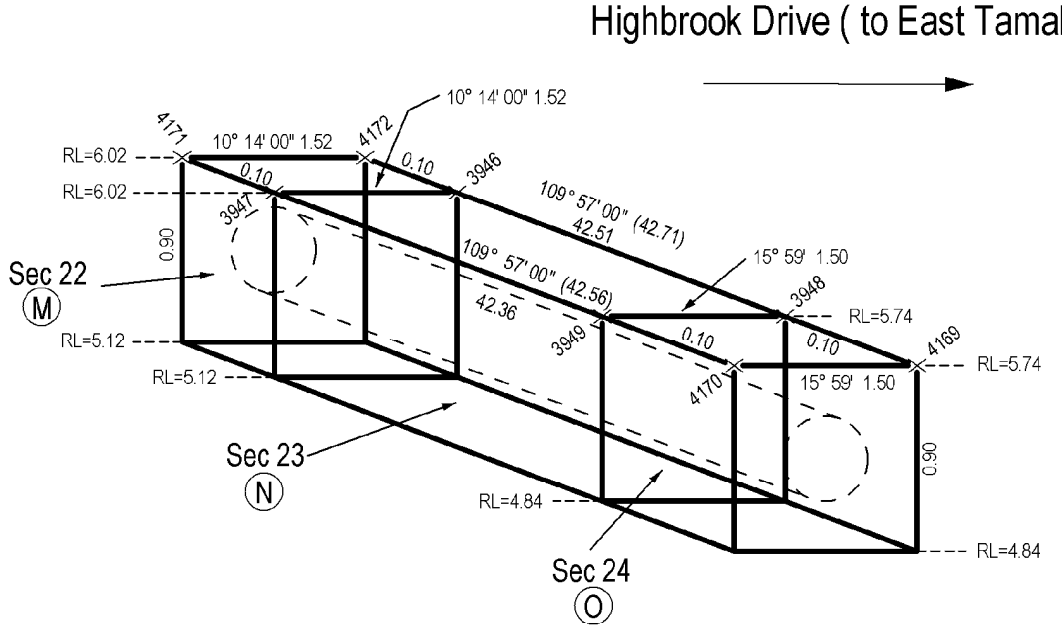
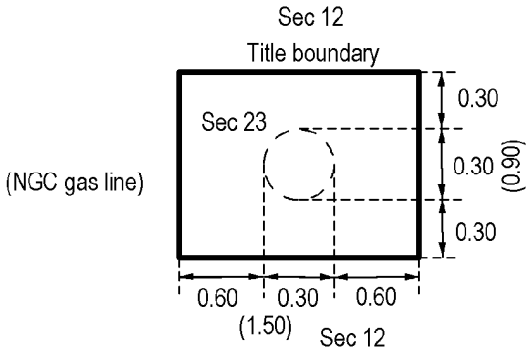
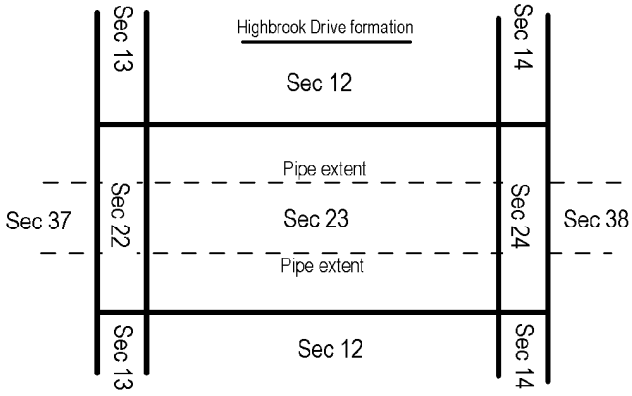
DRAWING NUMBER	86449/EB2	





Typical Cross Section



Typical Long Section

Notes:

1, × indicates the Landonline point and the number adjacent is the Landonline reference.
2, See LOL Title Plan sheets 5 & 9 for Section 22 - 24 locations
3, Dimensions shown are plan view dimensions
4, Heights are in term of LINZ Mean Sea Level Datum 1946
Origin of levels : RM 4887 SO 55767
RL= 14.09m

SO 403357

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PLAN OF SECTIONS 22 - 24 ON SECTIONS 12 - 14 SO 403357

HIGHBROOK DRIVE, EAST TAMAKI

SCALE (A4)		REVISION
NOT TO SCALE		C
SURVEYED	FF	11/05/05
DRAWN	CK	02/04/08
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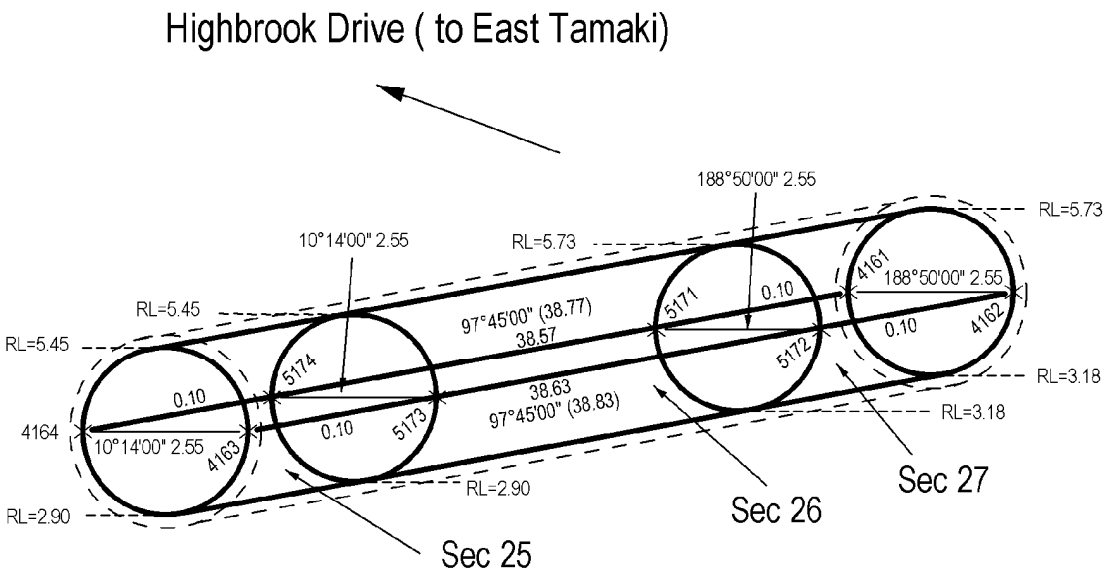
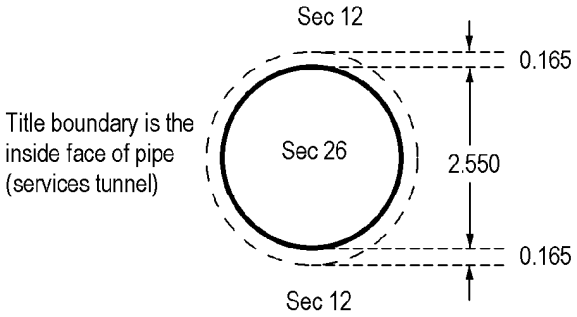
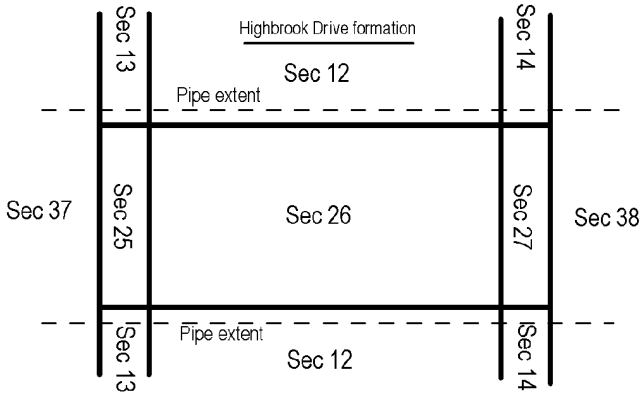
DRAWING NUMBER	86449/EB3	





Typical Cross Section



Typical Long Section

Notes:

1, × indicates the Landonline point and the number adjacent is the Landonline reference.
2, See LOL Title Plan sheets 5 & 9 for Section 25 - 27 locations
3, Dimensions shown are plan view dimensions
4, Heights are in term of LINZ Mean Sea Level Datum 1946
Origin of levels : RM 4887 SO 55767
RL= 14.09m

SO 403357

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Email: survey@ftl.co.nz

PLAN OF SECTIONS 25 - 27 ON SECTIONS 12 - 14 DP 403357

HIGHBROOK DRIVE, EAST TAMAKI

SCALE (A4)		REVISION
NOT TO SCALE		B
SURVEYED	FF	11/05/05
DRAWN	CK	02/04/08
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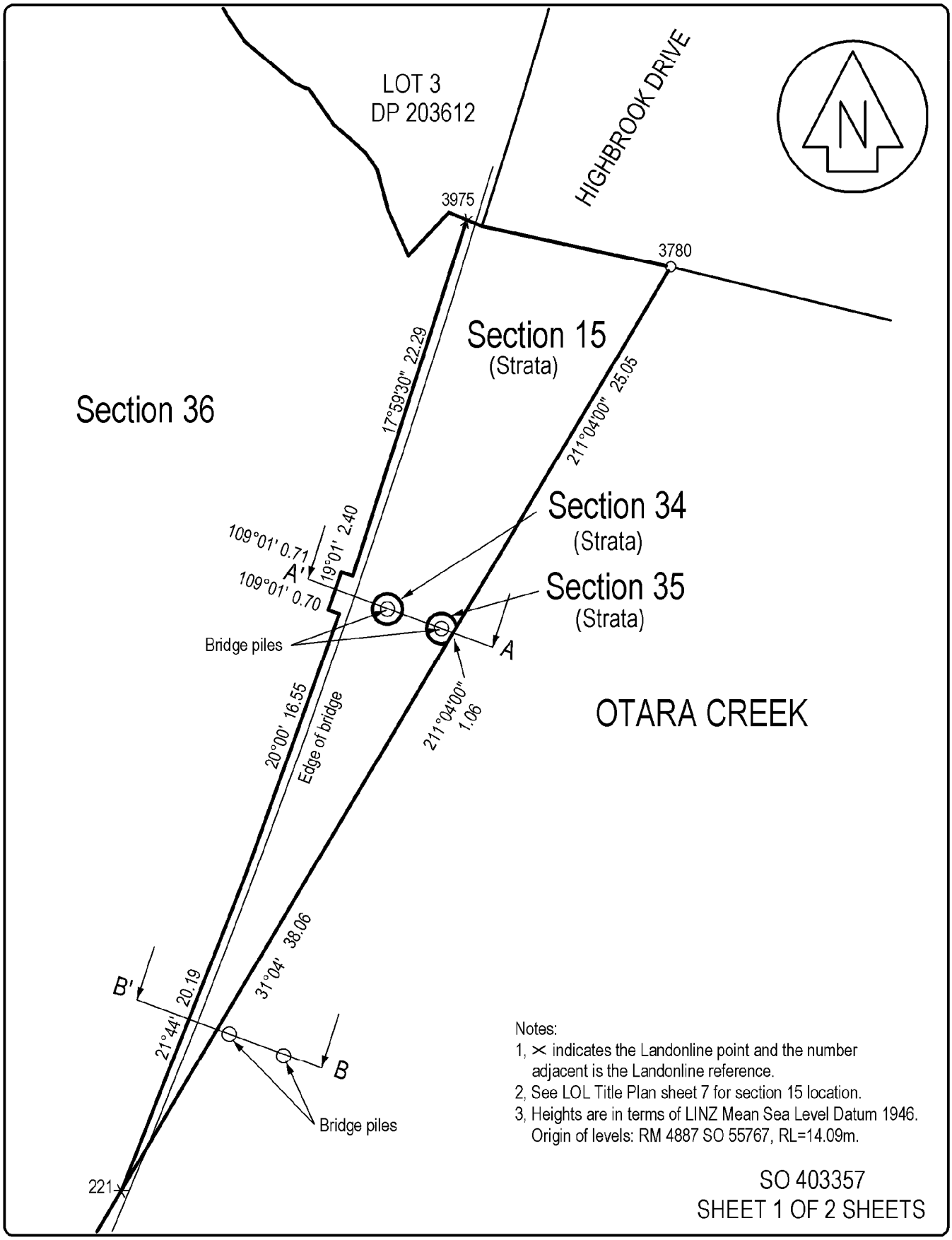

Notes:

1, ✕ indicates the Landonline point and the number adjacent is the Landonline reference.
2, See LOL Title Plan sheet 7 for section 15 location.
3, Heights are in terms of LINZ Mean Sea Level Datum 1946. Origin of levels: RM 4887 SO 55767, RL=14.09m.

SO 403357
SHEET 1 OF 2 SHEETS

Fraser Thomas
SURVEYORS & ENGINEERS
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PLAN OF SECTIONS 15, 34 & 35
SO 403357

HIGHBROOK DRIVE, EAST TAMAKI

SCALE: (A4)		REVISION
1:300		
SURVEYED	MB	17/3/09
DRAWN	JGS	18/3/09
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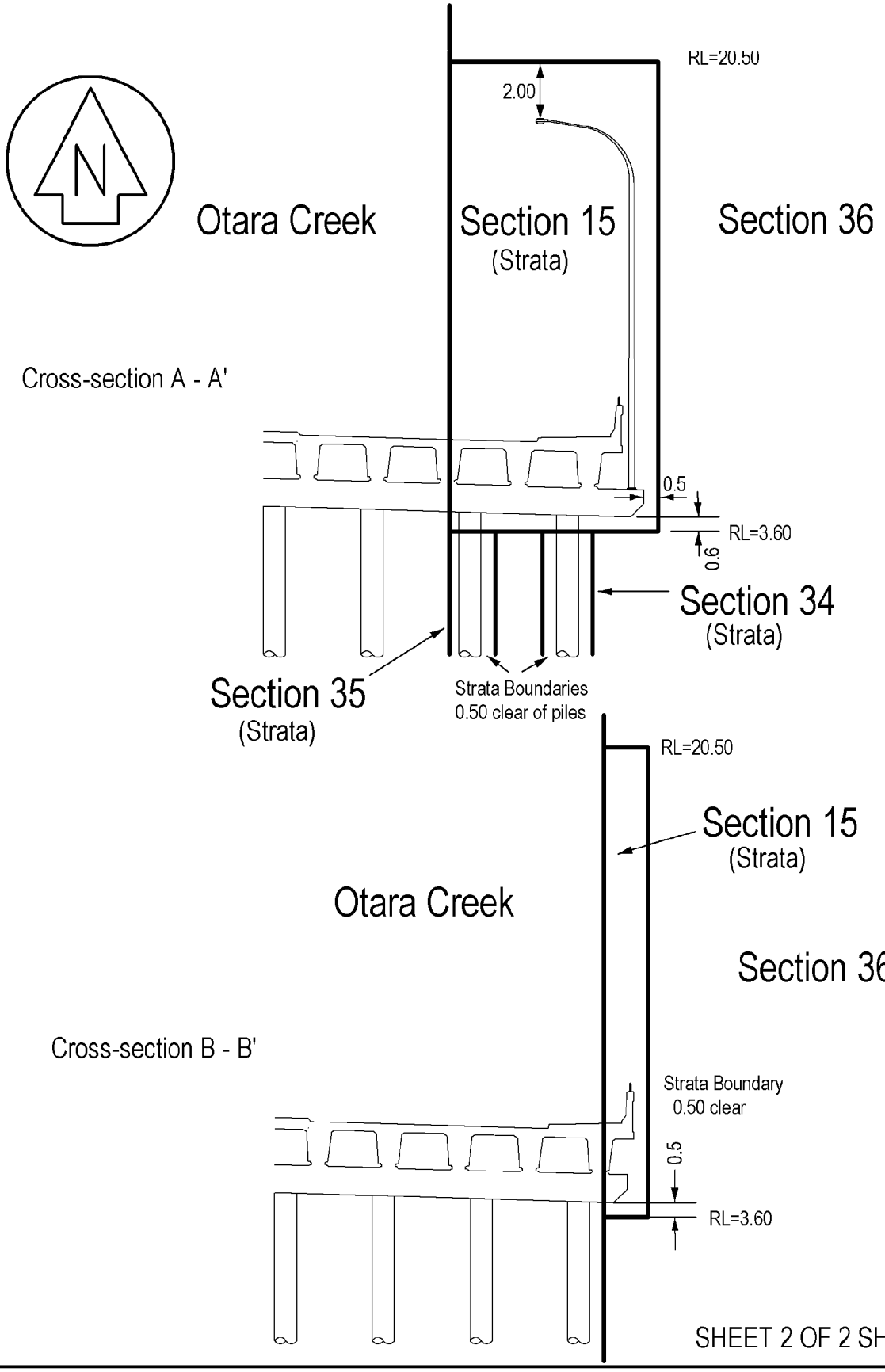

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PLAN OF SECTIONS 15, 34 & 35
SO 403357
HIGHBROOK DRIVE, EAST TAMAKI

SCALE (A4)		REVISION
1:200		
SURVEYED	JGS	18/3/09
DRAWN	MB	17/3/09
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DRAWING NUMBER	86449/EB5	

Fraser Thomas

- CONSULTING ENGINEERS
- RESOURCE MANAGERS
- ENVIRONMENTAL CONSULTANTS
- SURVEYORS & PLANNERS

FRASER THOMAS LIMITED
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WWW.fraserthomas.co.nz

Land Registration District	Plan Number
North Auckland	SO 403357

Land to be acquired for public road			
Shown	**Description**	**CT**	**Area (Ha)**
Section 3	Part Lot 1 DP 204791	NA 133B/131	0.0101
Section 4	Part Lot 1 DP 204791	NA 133B/131	0.0050
Section 5	Part Lot 1 DP 204791	NA 133B/131	0.0099
Section 12	Part Lot 2 DP 209362	NA137B/367	3.4393
Section 34 (Strata)	Part Section 3 SO 69716	NA125B/883	0.0003
Section 35 (Strata)	Part Section 3 SO 69716	NA125B/883	0.0002
Section 15 (Strata)	Part Section 3 SO 69716	NA125B/883	0.0353

Land to be set apart for road			
Shown	**Description**	**CT**	**Area (Ha)**
Section 2	Part Lot 1 DP 201385	NA130A/437	0.5500
Section 6	Part Lot 1 DP 201385	NA130A/437	0.9884

Severence lot			
Shown	**Description**	**CT**	**Area**
Section 1	Part Lot 1 DP 201385	NA130A/437	0.6244
Section 8	Part Lot 1 DP 201385	NA130A/437	0.7553

Land to be acquired for motorway purposes			
Shown	**Description**	**CT**	**Area (Ha)**
Section 10	Part Lot 2 DP 209362	NA137B/367	0.0946

Land to be acquired for motorway			
Shown	**Description**	**CT**	**Area (Ha)**
Section 11	Part Lot 2 DP 209362	NA137B/367	0.3058

Land to be acquired for boundary/segregation strip			
Shown	**Description**	**CT**	**Area (Ha)**
Section 13	Part Lot 2 DP 209362	NA137B/367	0.0057
Section 14	Part Lot 2 DP 209362	NA137B/367	0.0073
Section 29	Part Lot 1 DP 204791	NA 133B/131	0.0003
Section 31	Part Lot 1 DP 204791	NA 133B/131	0.0003
Section 33	Part Lot 1 DP 204791	NA 133B/131	0.0004

Land to be set apart for boundary/segregation strip			
Shown	**Description**	**CT**	**Area (Ha)**
Section 28	Part Lot 1 DP 201385	NA130A/437	0.0001
Section 30	Part Lot 1 DP 201385	NA130A/437	0.0007
Section 32	Part Lot 1 DP 201385	NA130A/437	0.0004

Sections 15 – 27, 34 & 35 are Strata Parcels, see plan graphic for details.

Fraser Thomas

- CONSULTING ENGINEERS
- RESOURCE MANAGERS
- ENVIRONMENTAL CONSULTANTS
- SURVEYORS & PLANNERS

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www.fraserthomas.co.nz

Land Registration District

North Auckland

Plan Number

SO 403357

Territorial Authority (the Council)

AUCKLAND COUNCIL

Proposed Easements			
Purpose	**Shown**	**Servient Tenement**	**Dominant Tenement**
Right of way, water supply, sewerage & stormwater drainage, gas, electricity, telecommunications and liquid fuel supply	B Hereon	Section 38 Hereon	Lot 1 DP 209362
Right of way	C Hereon	Section 13 Hereon	Sections 37 & 38 Hereon
Stormwater drainage	D Hereon	Section 38 Hereon	Lot 1 DP 209362
	E Hereon	Section 37 Hereon	
	F Hereon (Height Restricted)	Section 19 Hereon	Lot 1 DP 209362 & Section 39 Hereon
	G Hereon (Height Restricted)	Section 20 Hereon	
	H Hereon (Height Restricted)	Section 21 Hereon	
	AK, S, R, K, AB, AC, Y & D Hereon	Section 38 Hereon	Section 39 Hereon
	E, AE & AV Hereon	Section 37 Hereon	
Telecommunications and Electricity Supply	AJ Hereon	Section 39 Hereon	Lot 1 DP 209362
Water Supply and Wastewater Drainage	BB Hereon		Section 38 Hereon
Proposed Easements in Gross			
Purpose	**Shown**	**Servient Tenement**	**Grantee**
Right of way	B Hereon	Section 38 Hereon	Manukau City Council
Right to Convey Water	B Hereon	Section 38 Hereon	Manukau Water Ltd
Electricity Supply	I Hereon	Section 1 Hereon	Vector Ltd
Gas Supply	V, X, AA, AB & AT Hereon	Section 38 Hereon	
	AE, AW & AU Hereon	Section 37 Hereon	
	M Hereon (Height Restricted)	Section 22 Hereon	
	N Hereon (Height Restricted)	Section 23 Hereon	
	O Hereon (Height Restricted)	Section 24 Hereon	

Fraser Thomas Limited
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PO Box 23273 : Hunters Corner : MANUKAU 2155
AUCKLAND : NEW ZEALAND
TEL +64 9 278 7078 : FAX +64 9 278 3697

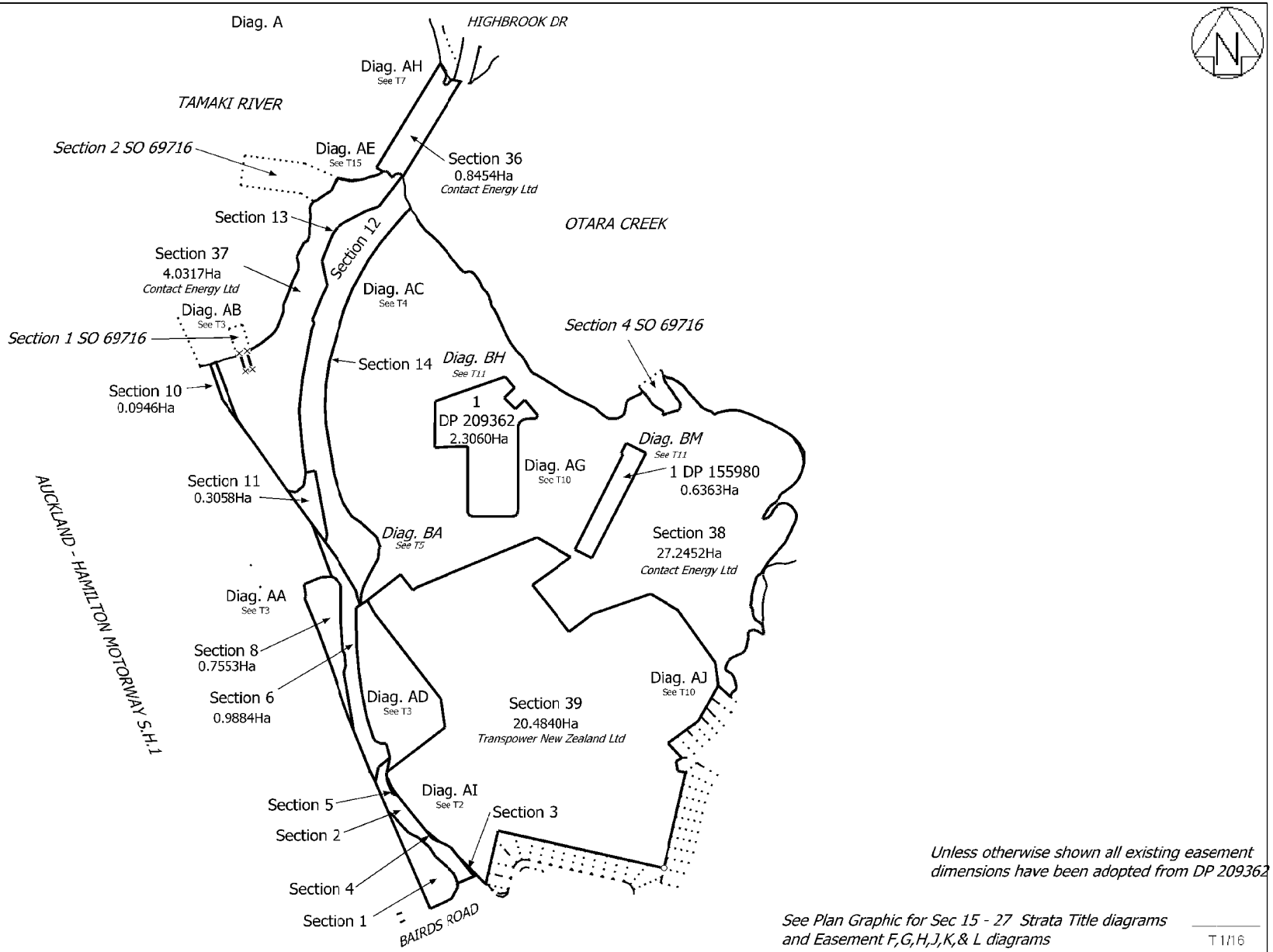
Fraser Thomas
ENGINEERS RESOURCE MANAGERS SURVEYORS

Land Registration District
NORTH AUCKLAND

Plan Number
SO 403357

Territorial Authority (the Council)
AUCKLAND COUNCIL

Schedule of Existing Easements/ Interests to Remain with Land (Pursuant to s239(2) of the Resource Management Act 1991)			
Purpose/Interest	**Shown/Document Number**	**Servient Tenement**	**Created By**
Right of Way	AZ Hereon	Section 39 Hereon	8196479.2
Right of Way, Water Supply, Sewage and Stormwater Drainage and Gas, Electricity, Telecommunications and Liquid Fuel Supply			8196479.1
Right of Way and Right to Convey Water, Drain Sewage and Waste Water and to Electricity, Communications, Gas and Liquid Fuel Rights	J Hereon		D640353.5
Water Drainage Right	A, AF & AG Hereon	Section 38 Hereon	T91645
Electricity Right	AX & AY hereon		T595037
Right of Way and Right to Convey Water	P, R, T, S, AP & AO Hereon		D640353.10
Right of Way and Water Supply, Sewerage and Stormwater Drainage, Gas and Electricity Supply, Telecommunications and Liquid Fuel Supply rights	P, U, T & R Hereon		D640353.11
Stormwater Drainage	L, AP, S, R, AO, K, AB, AC, Y, AD, X, Z, W, V & Q Hereon		
Telecommunications and Electricity Supply Rights	AN, AM, AL, AI, AG & AH Hereon		
Right to Convey Electricity	AQ, AM, AR, BA & AS Hereon		T5271467.1
Stormwater Drainage	AE & AV	Section 37 Hereon	D640353.11
Noise, Vibration and Emission Rights		Section 1 Hereon	D533860.6

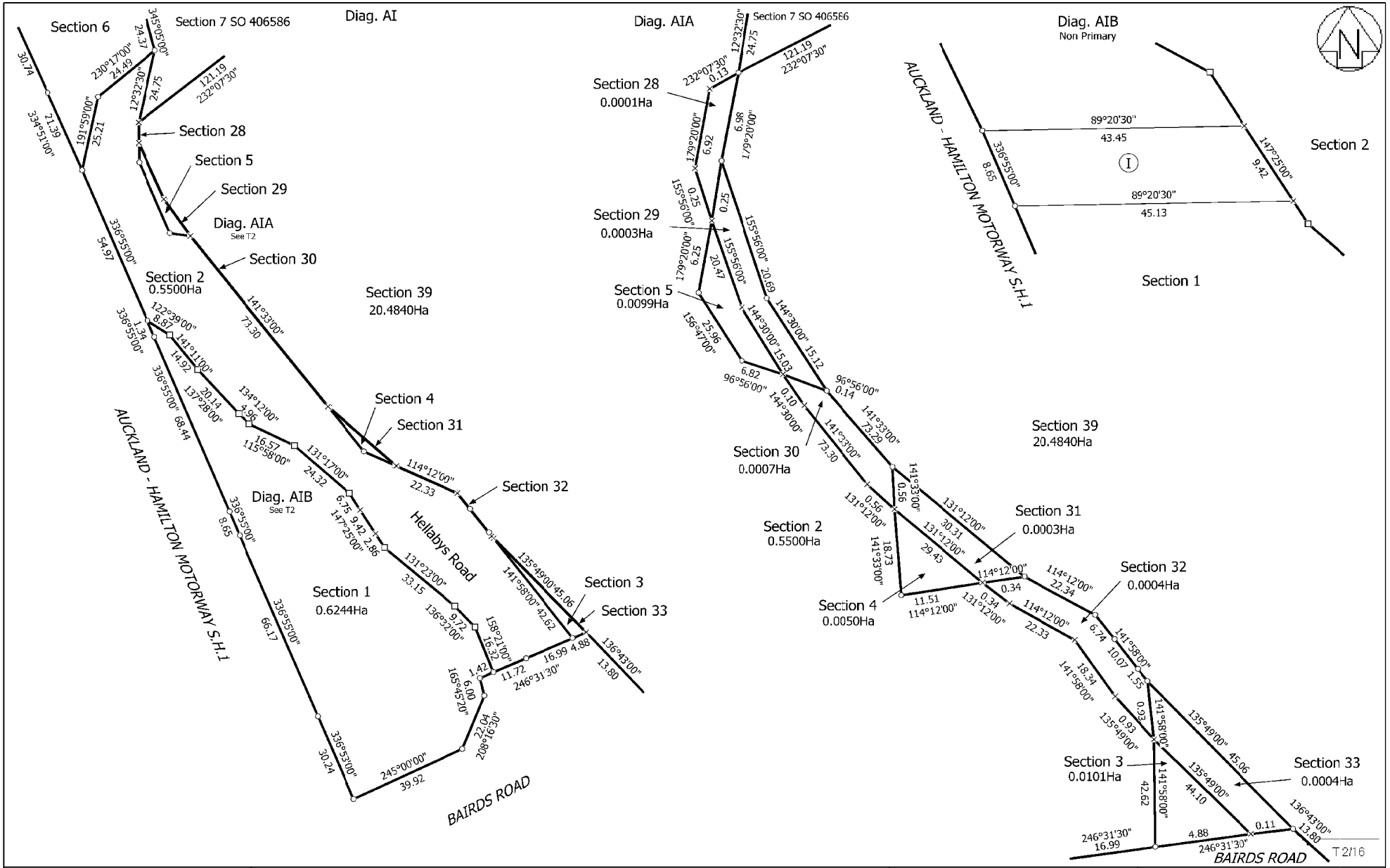


Unless otherwise shown all existing easement dimensions have been adopted from DP 209362

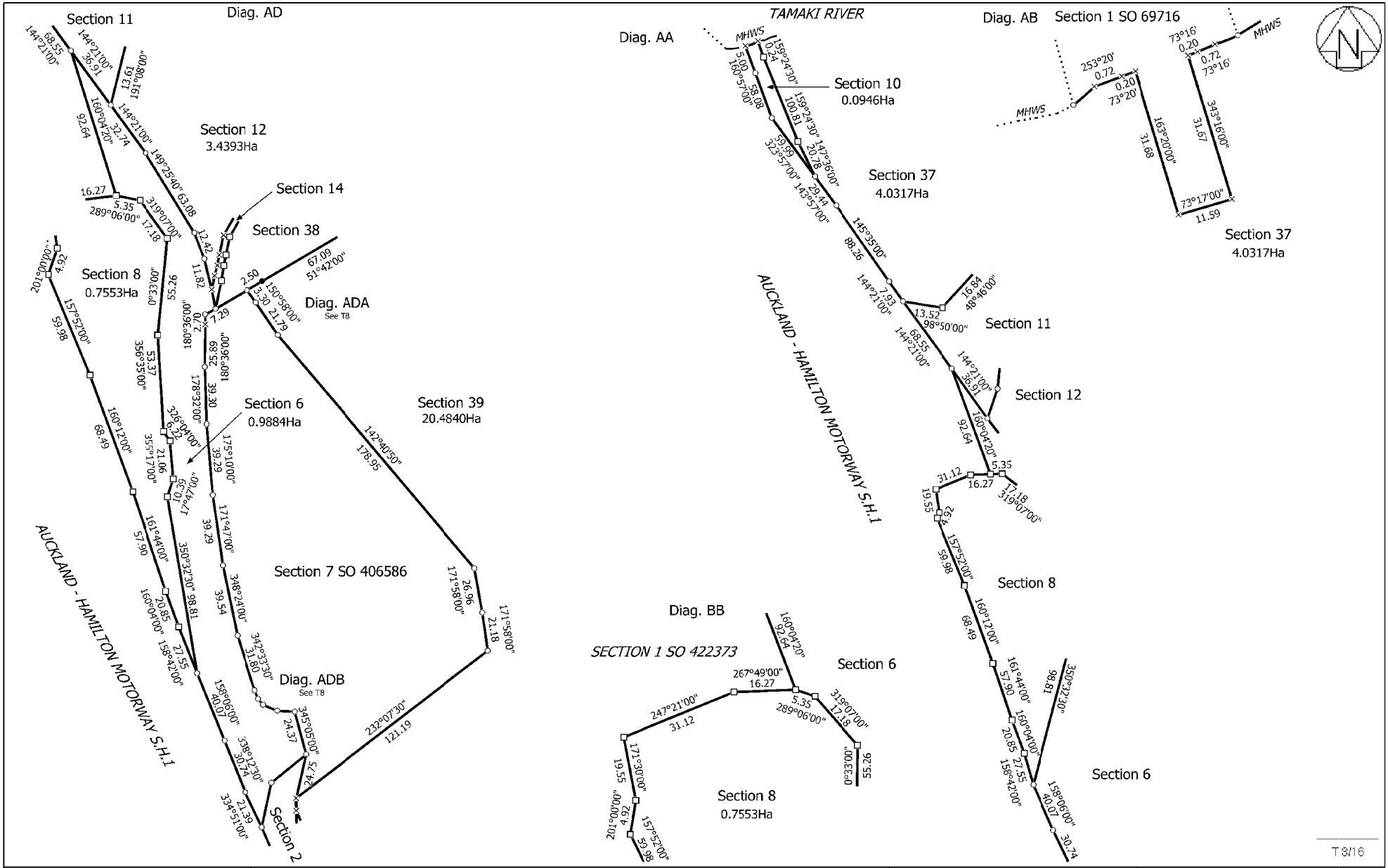
See Plan Graphic for Sec 15 - 27 Strata Title diagrams and Easement F,G,H,J,K,& L diagrams

T1/16

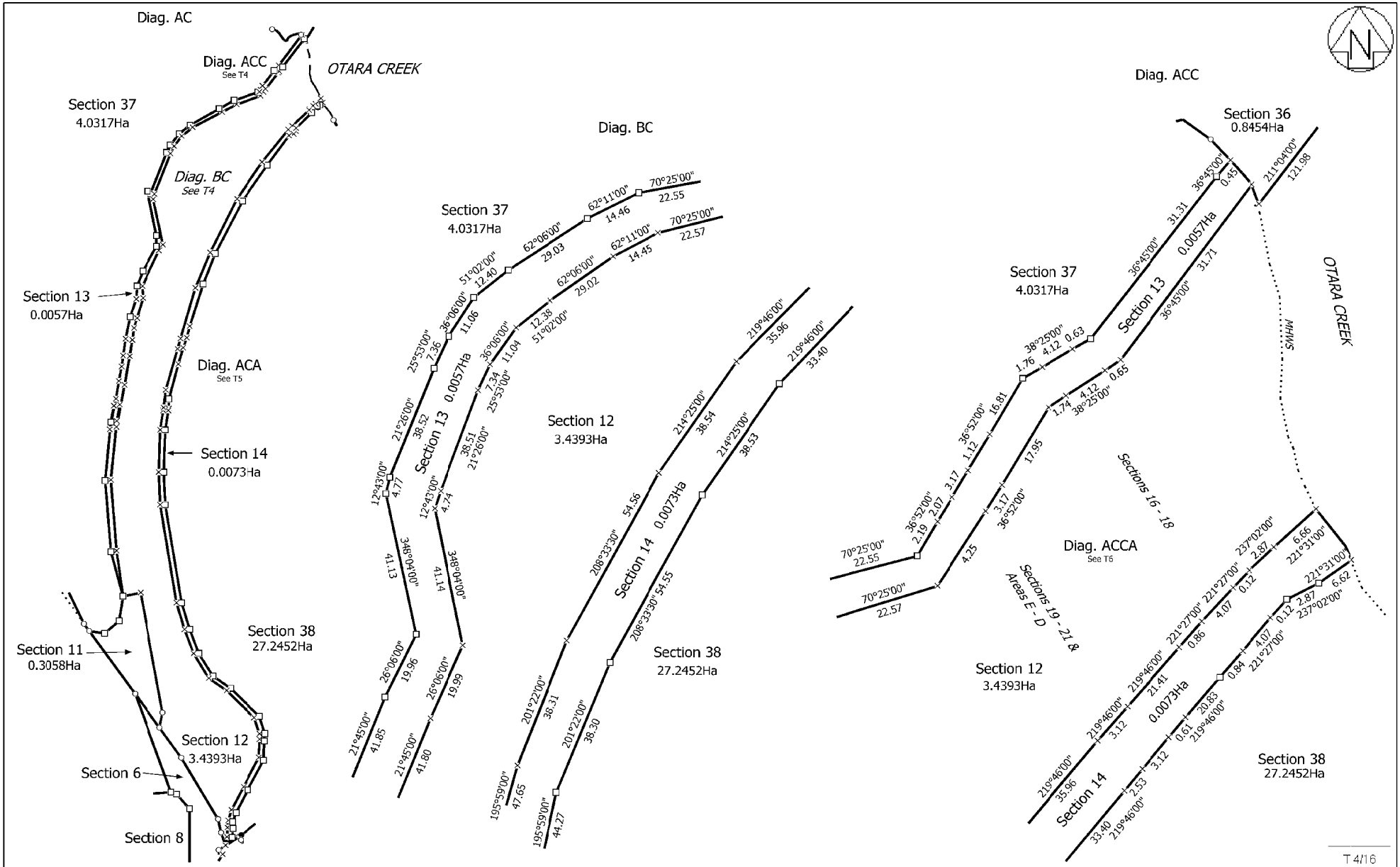
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 14 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



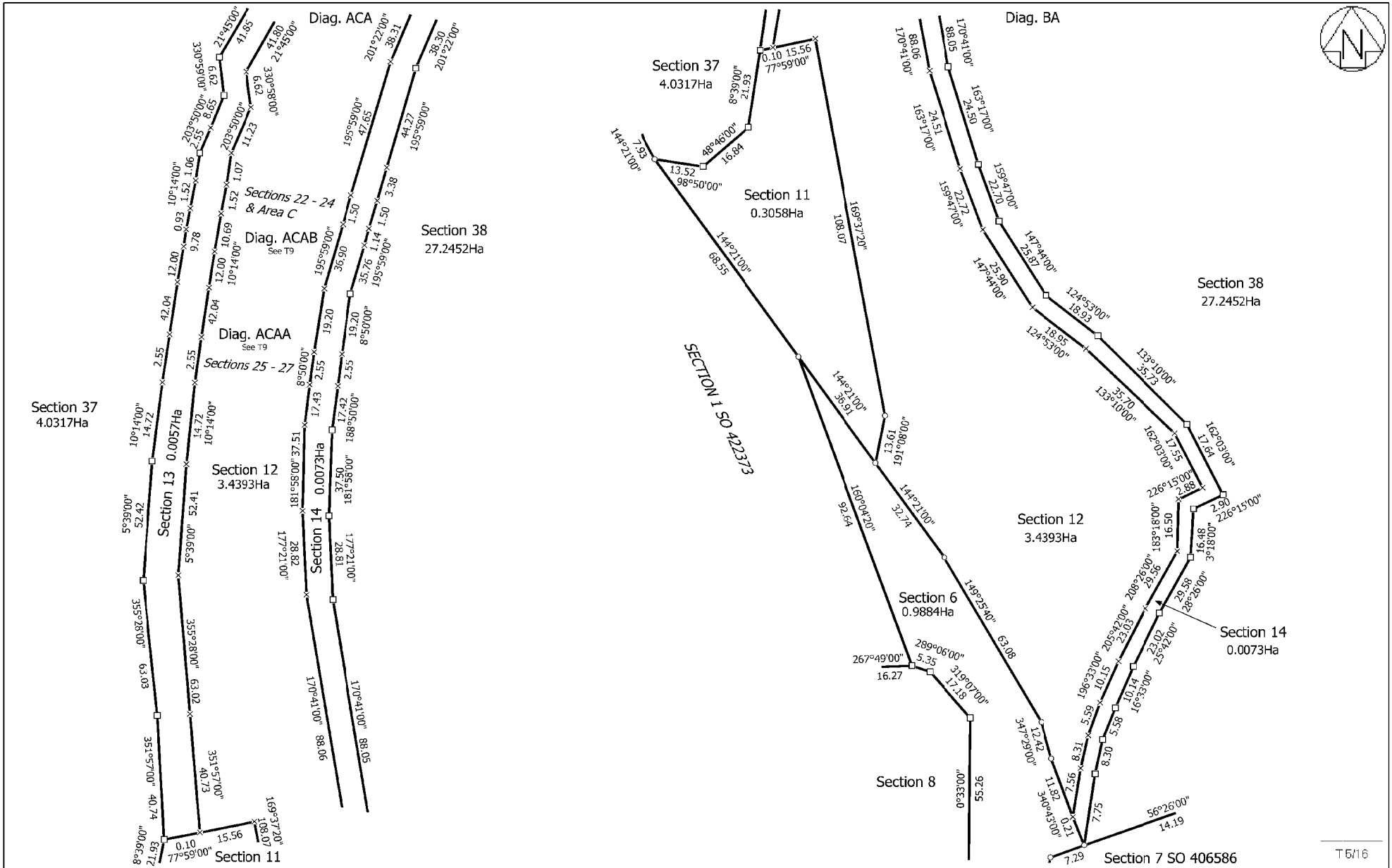
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 15 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



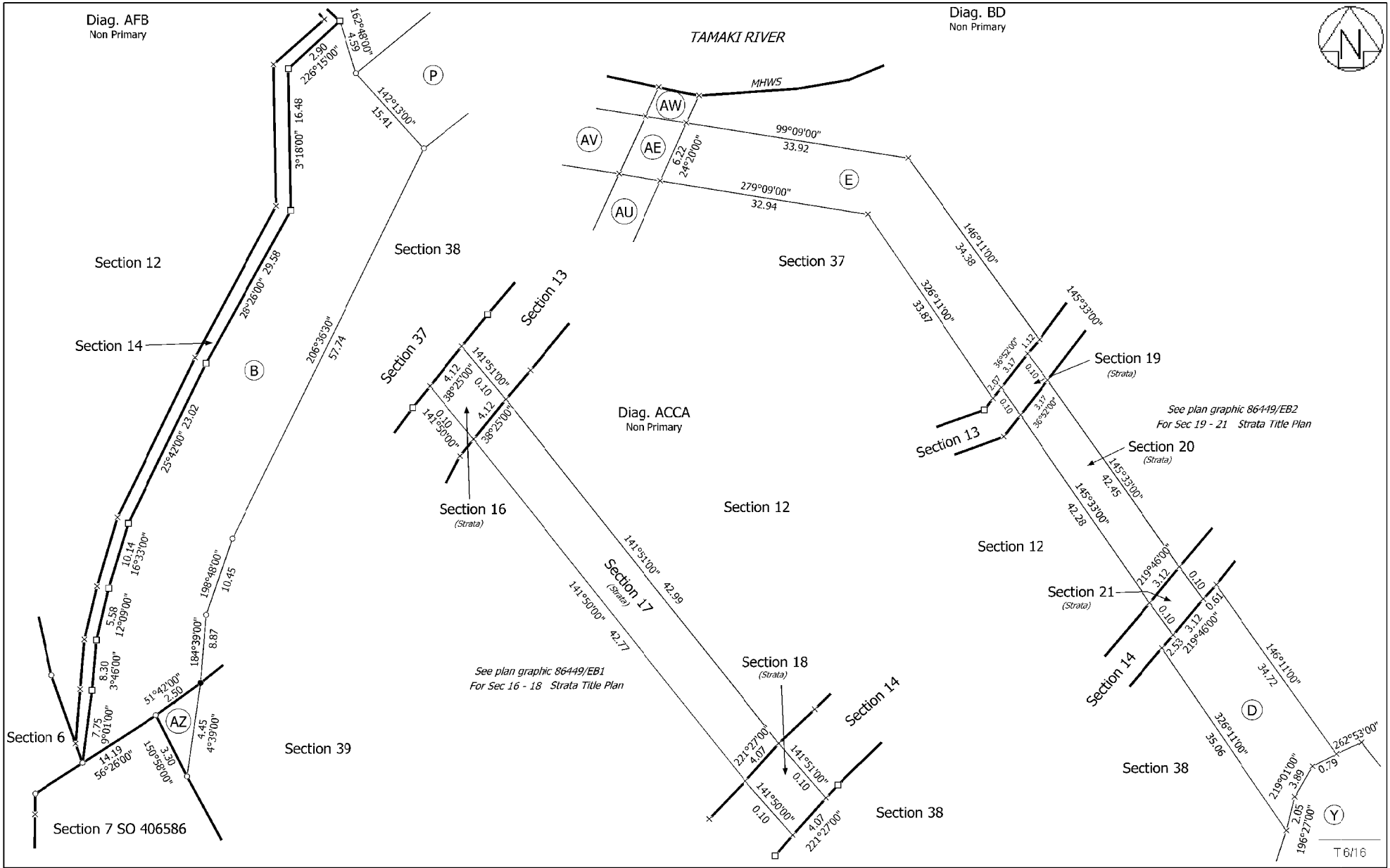
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 16 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



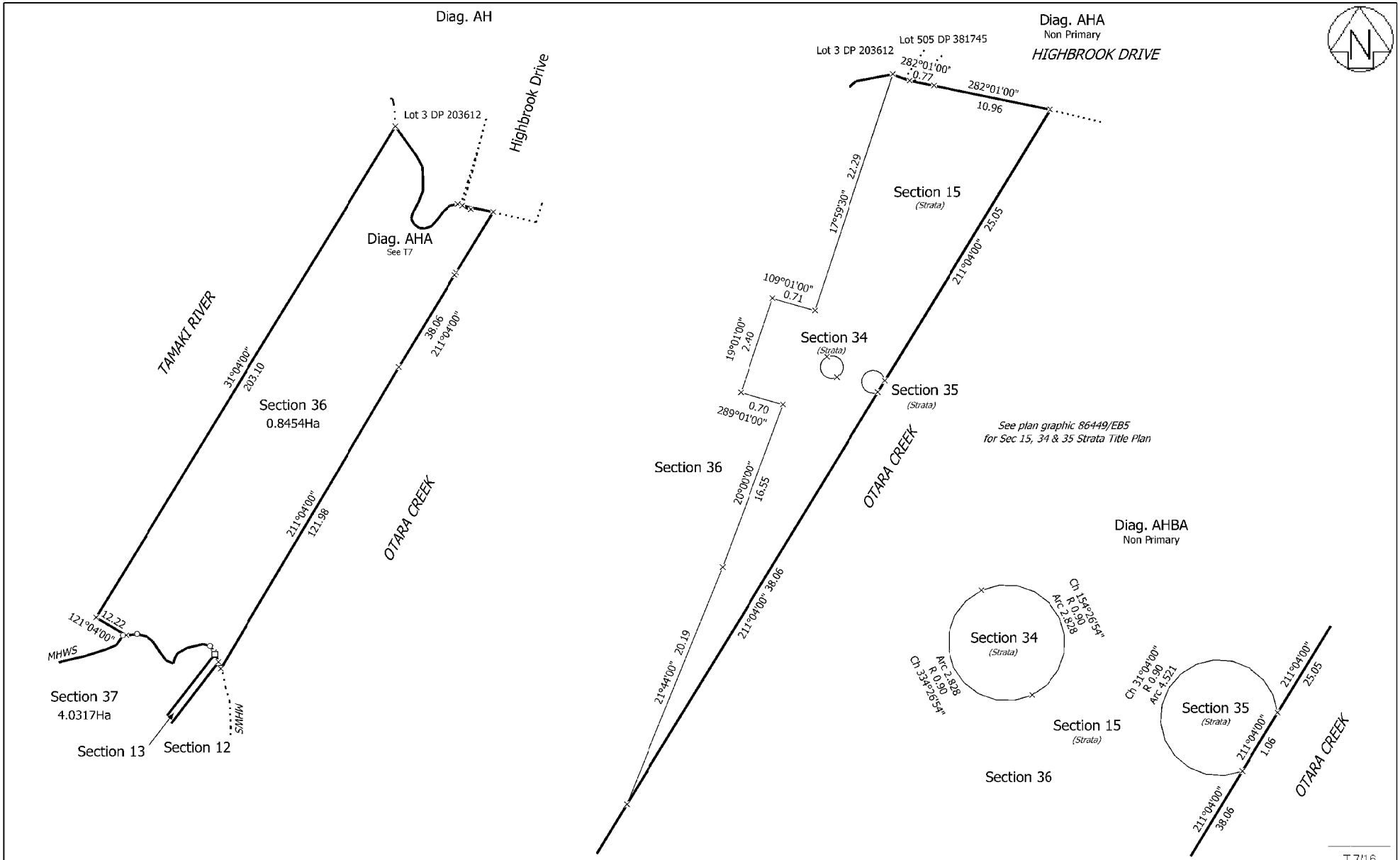
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 17 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



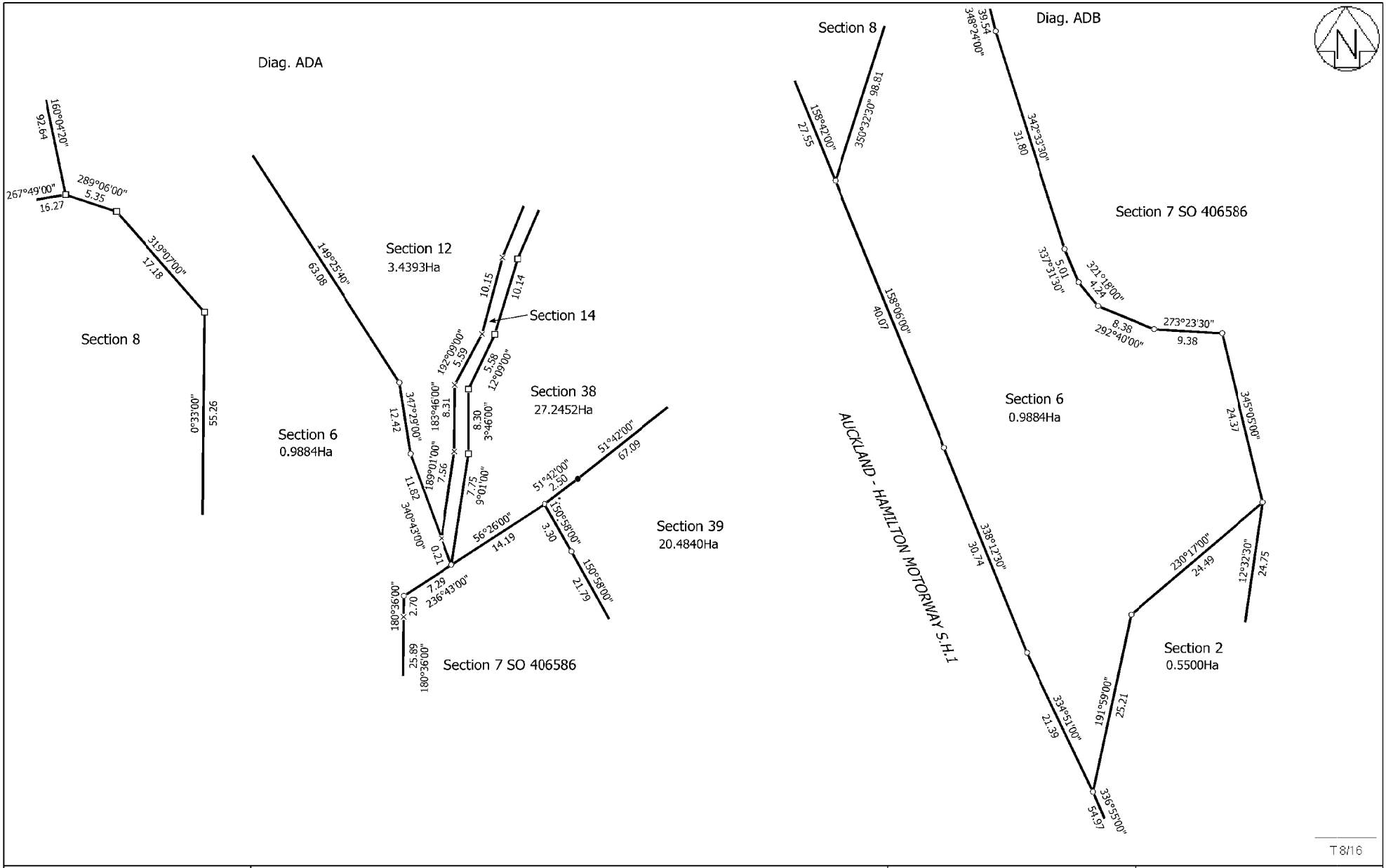
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 18 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



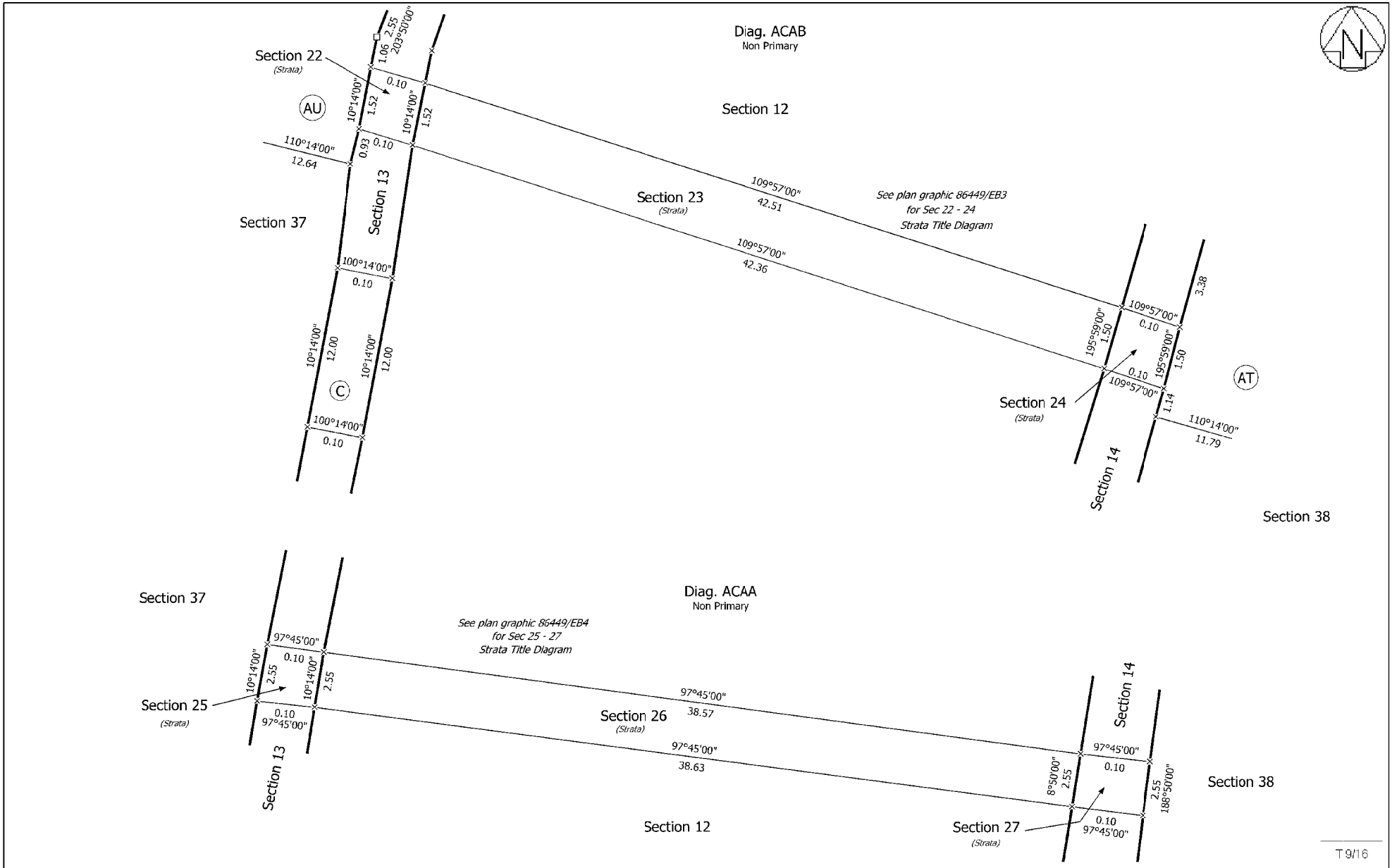
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 19 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



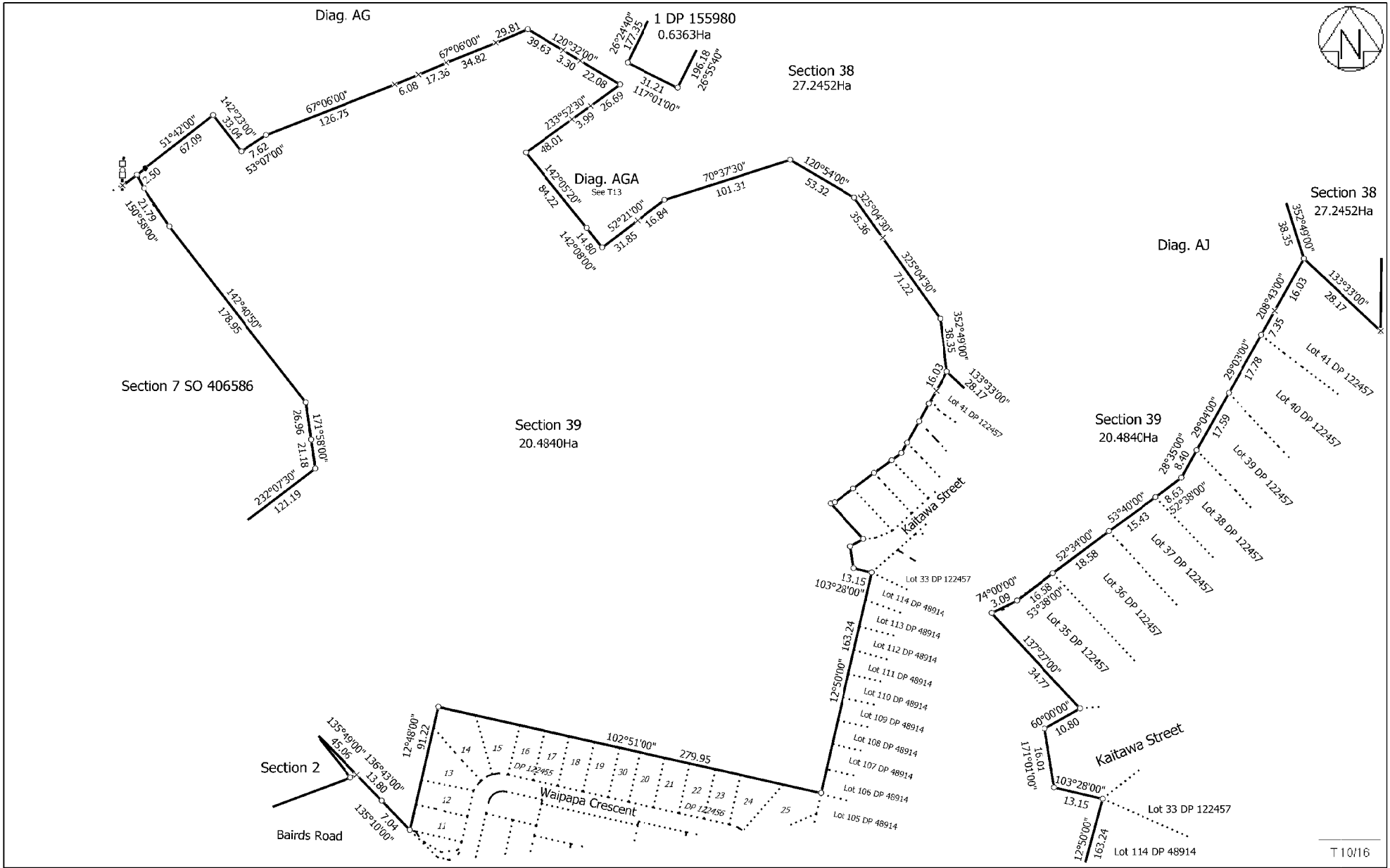
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 20 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



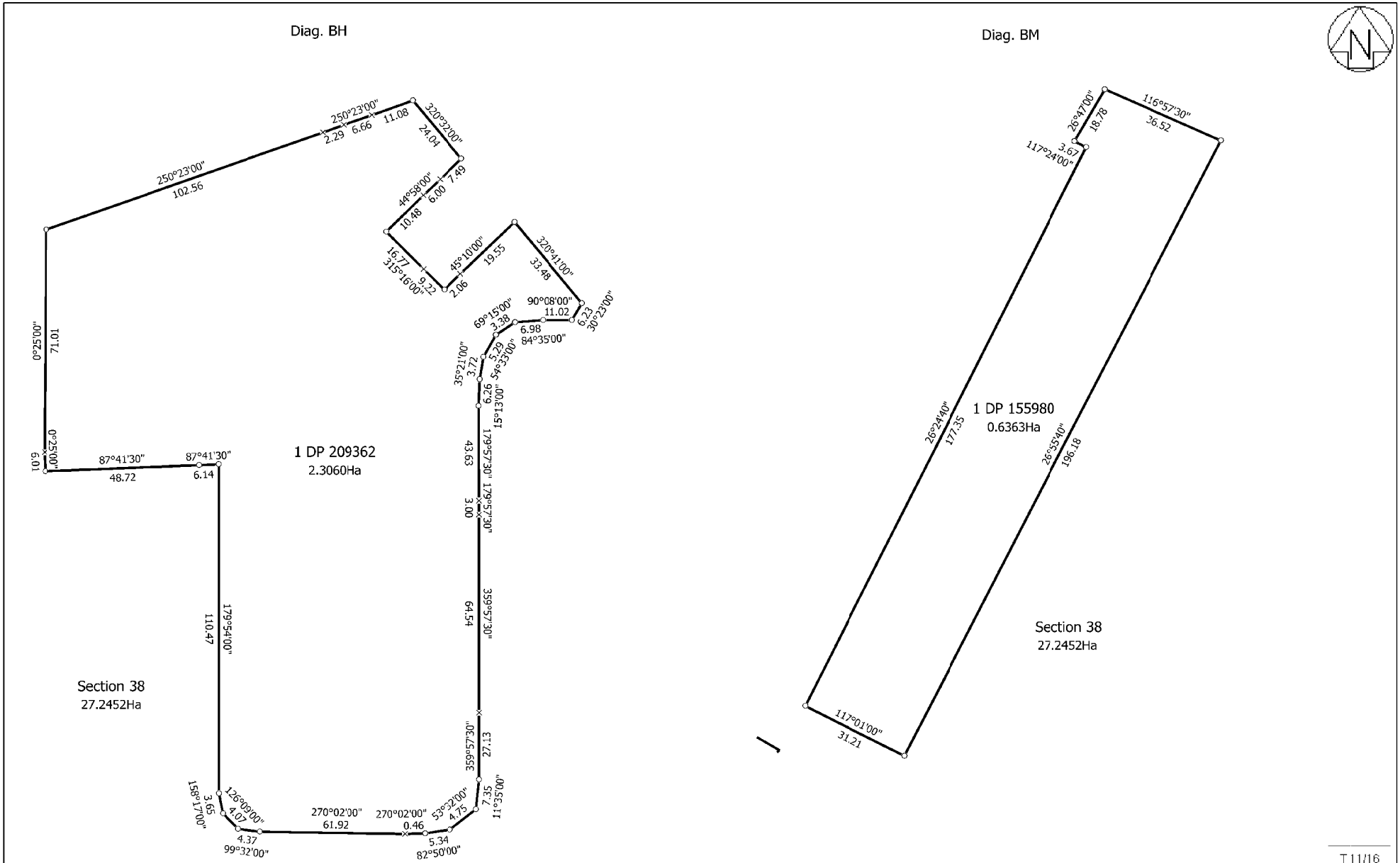
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 21 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



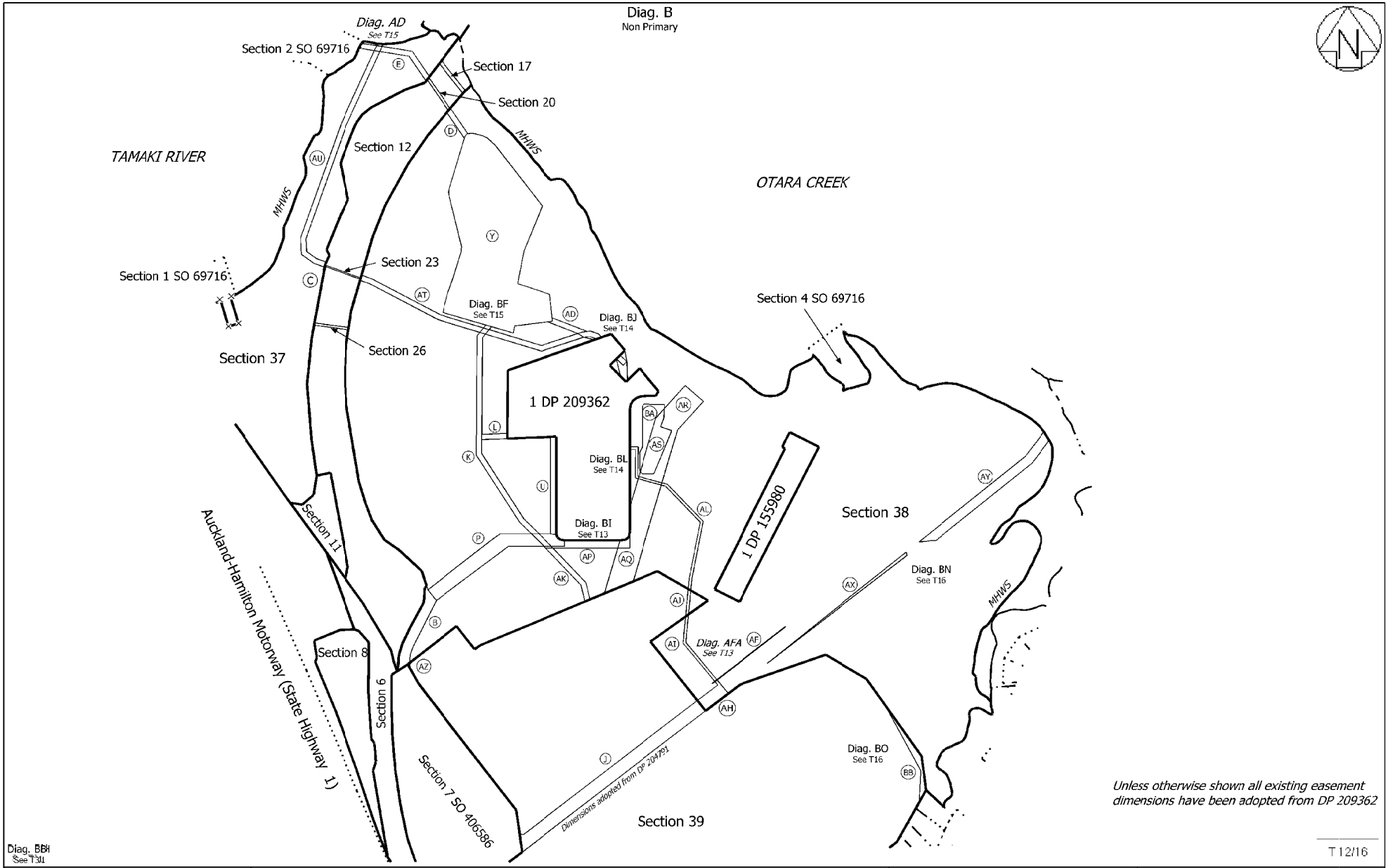
Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 22 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 23 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014

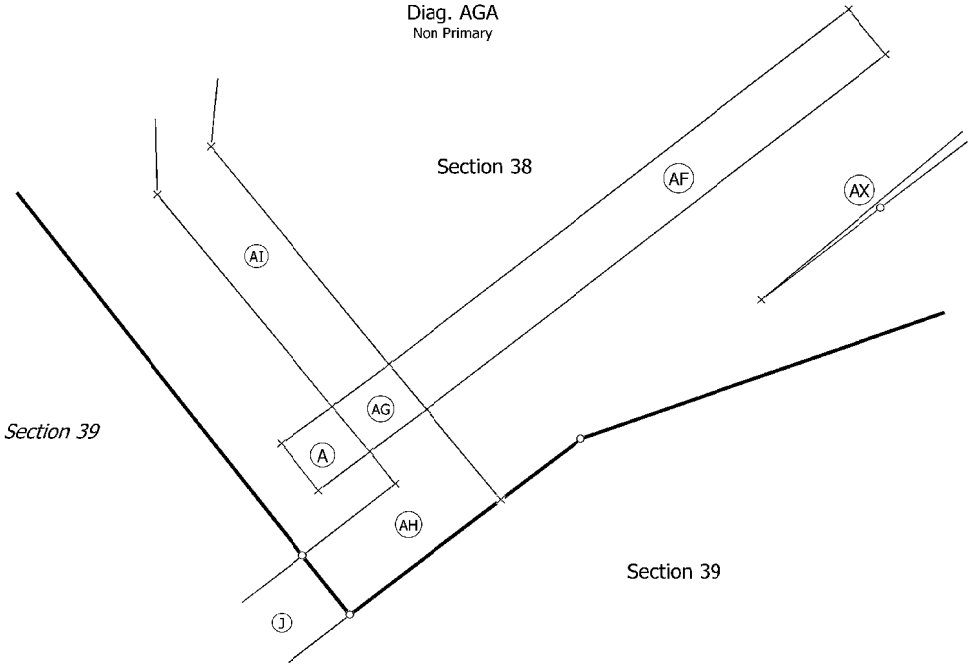


Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 24 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 25 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014

Diag. AGA
Non Primary



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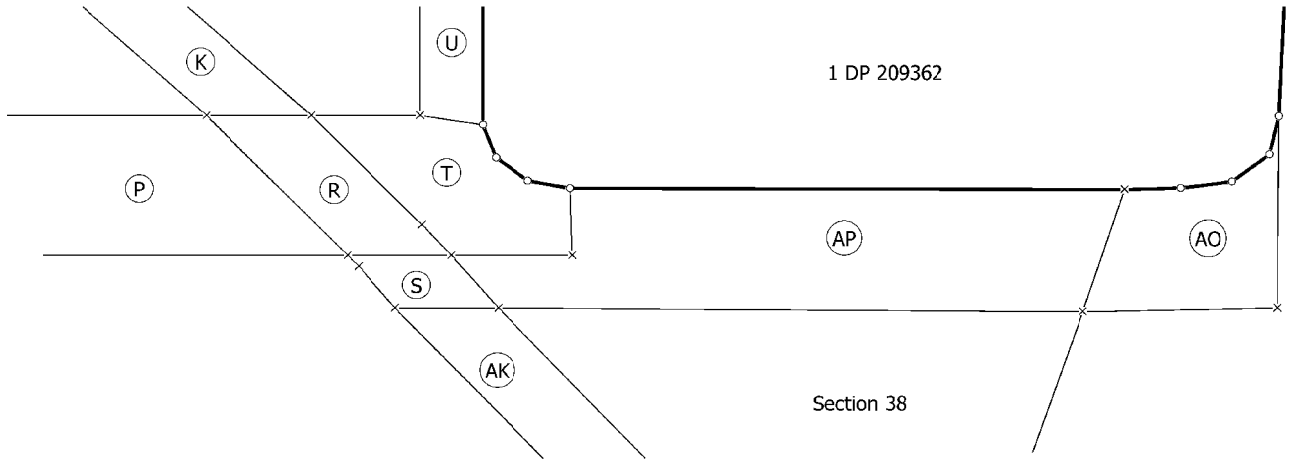
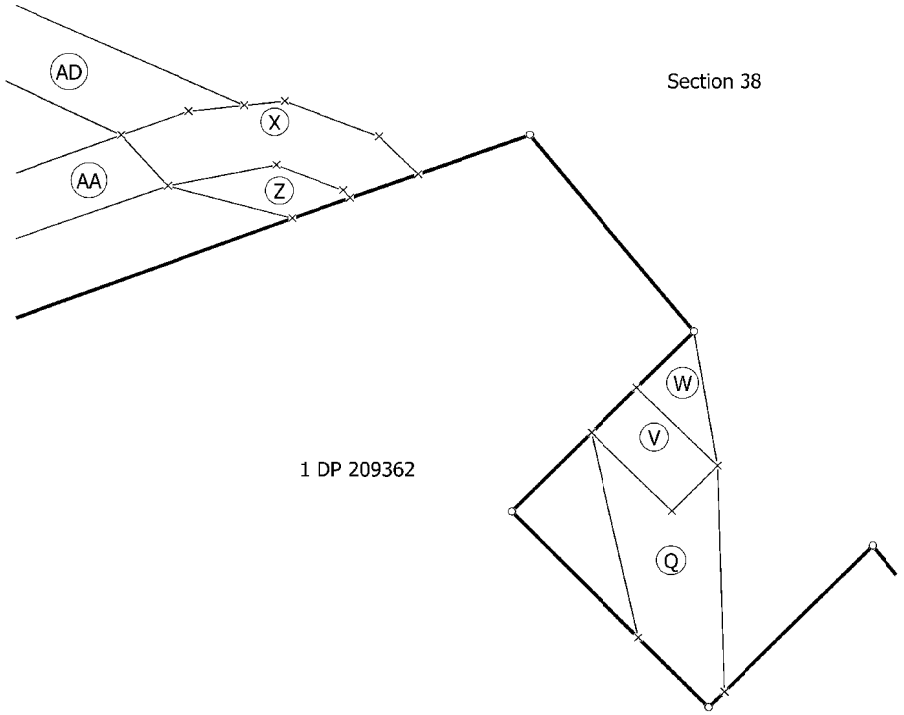


Unless otherwise shown all existing easement dimensions have been adopted from DP 209362

T 13/16

Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 26 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014

Diag. BJ
Non Primary



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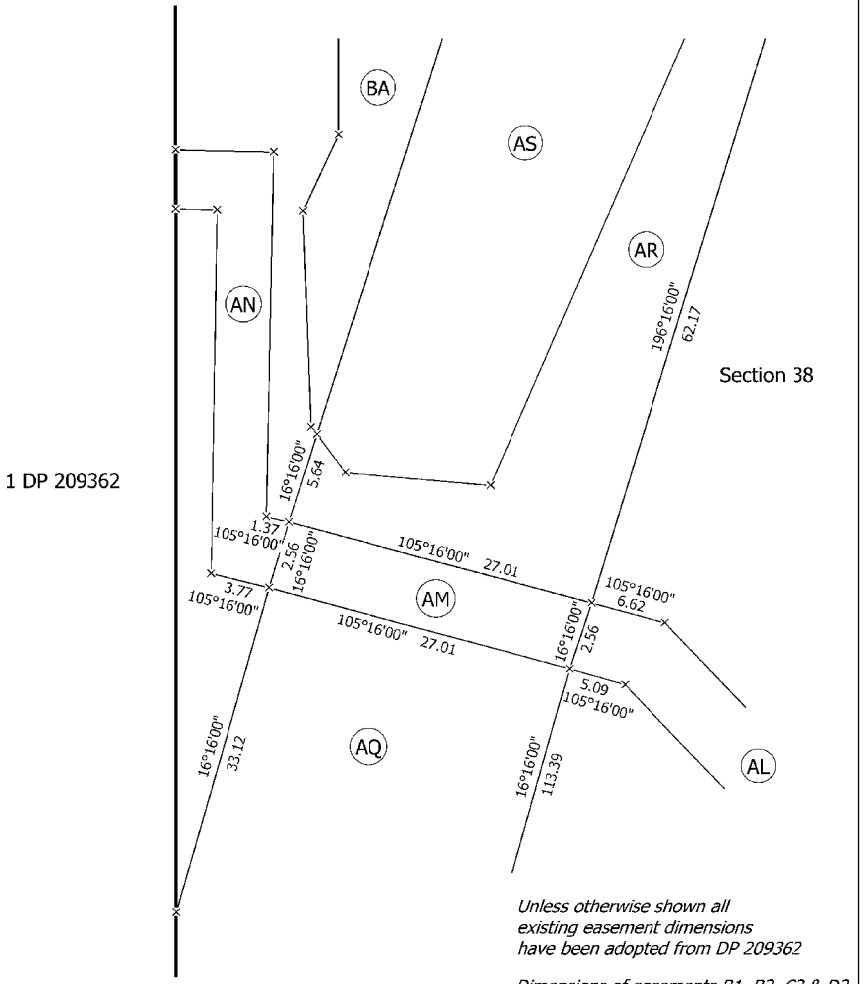
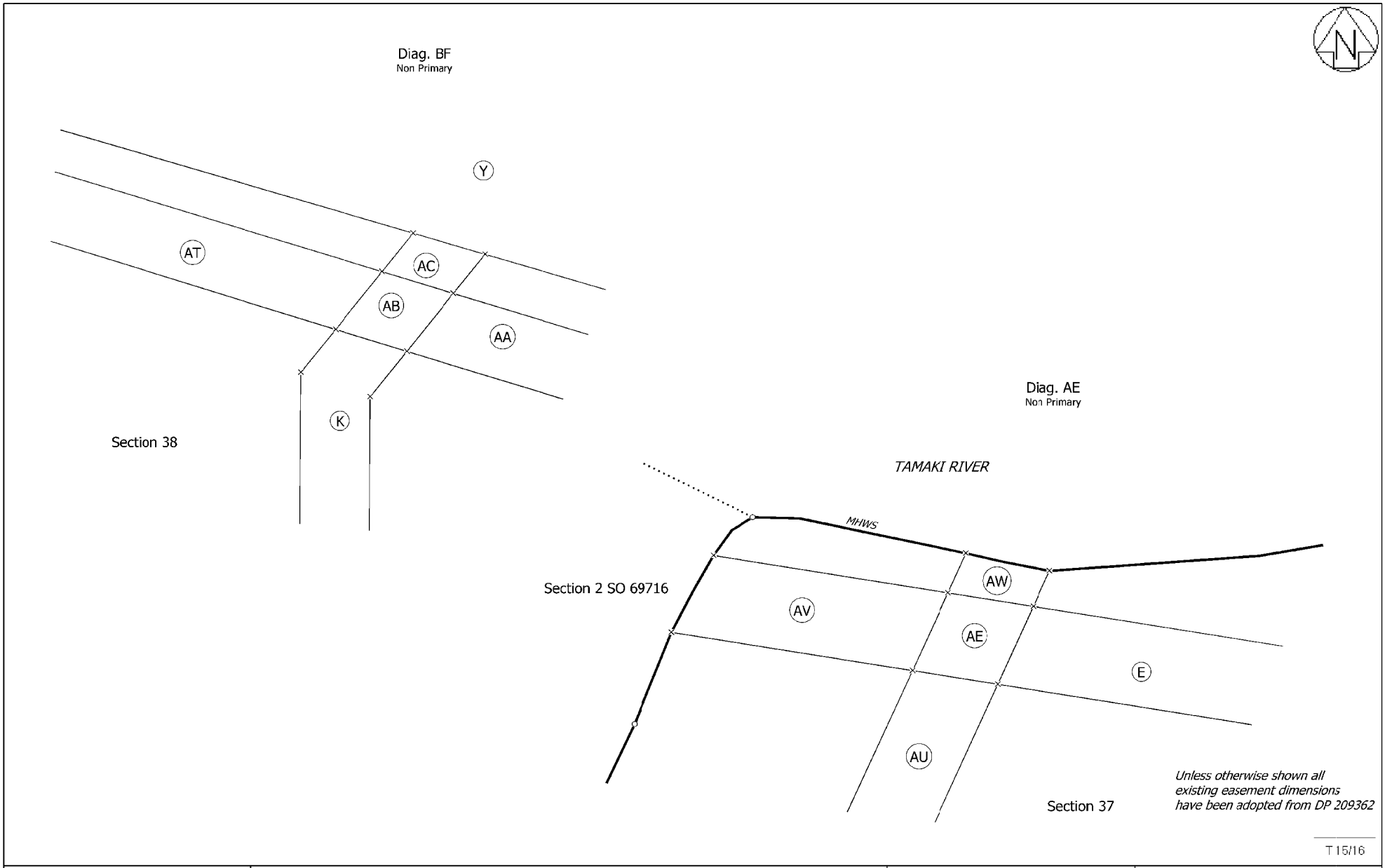


Unless otherwise shown all existing easement dimensions have been adopted from DP 209362

Dimensions of easements B1, B2, C2 & D2 have been adopted from DP 211681

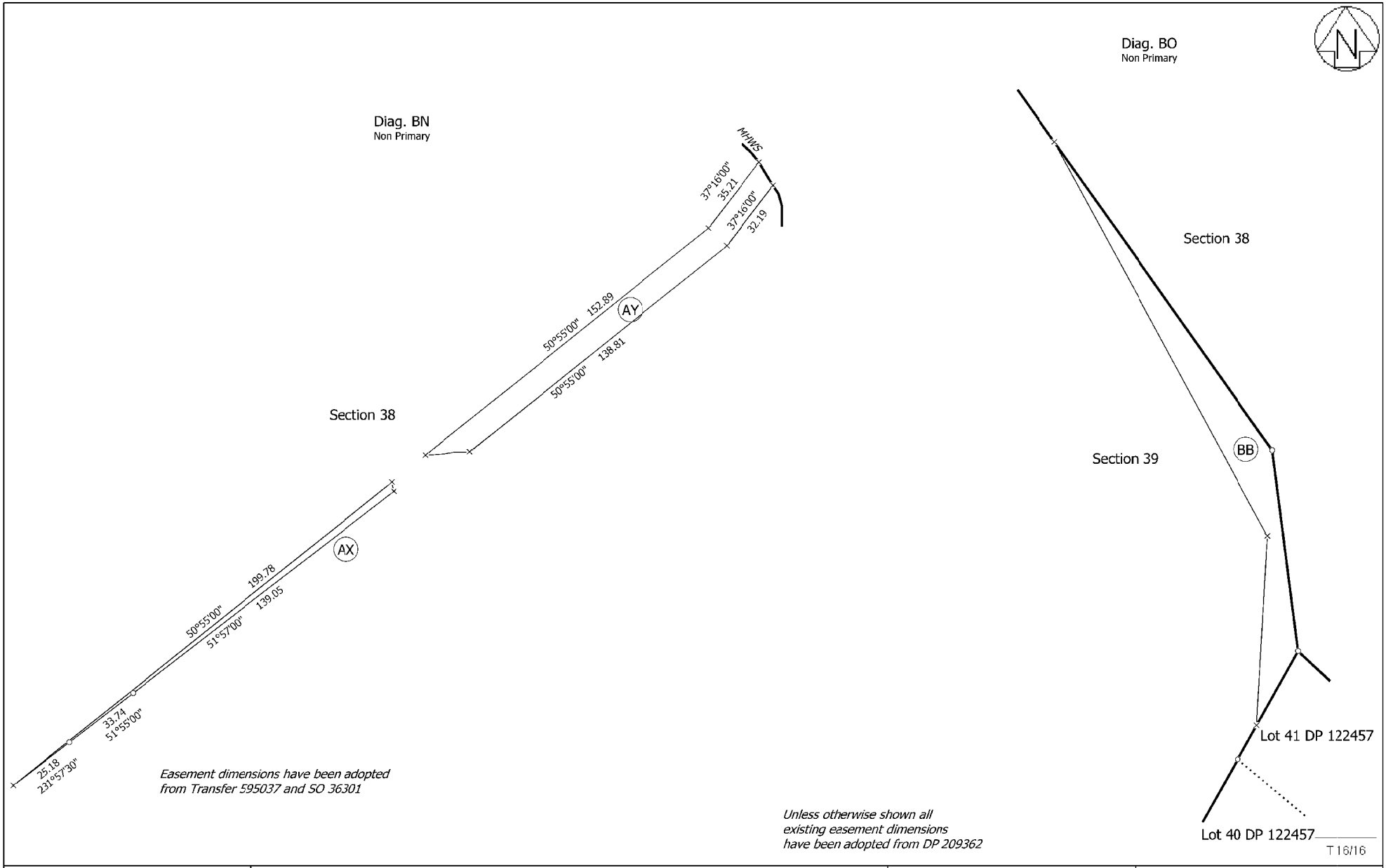
T 14/16

Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 27 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



T 15/16

Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 28 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014



Land District: North Auckland Digitally Generated Plan Generated on: 06/10/2014 09:25am Page 29 of 29	SECTIONS 1 - 6, 8 and 10 - 39	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Title Plan SO 403357 Approved on: 6/10/2014

Digital Title Plan - SO 406586

Survey Number	SO 406586
Surveyor Reference	86449 SEC 7 Contact
Surveyor	Gary Jackson Blyth
Survey Firm	Fraser Thomas Ltd (Auckland)
Surveyor Declaration	I Gary Jackson Blyth, being a person entitled to practise as a licensed cadastral surveyor, certify that - (a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2; (b) This dataset is accurate, and has been created in accordance with that Act and those Rules. Declared on 20/11/2008.

Survey Details

Dataset Description	SECTION 7		
Status	Approved as to Survey		
Land District	North Auckland	**Survey Class**	Class I Cadastral Survey
Submitted Date	20/11/2008	**Survey Approval Date**	21/11/2008
		Deposit Date	

Territorial Authorities

Manukau City

Comprised In

CT NA130A/437

Created Parcels

Parcels	Parcel Intent	Area	CT Reference
Easement C Survey Office Plan 406586	Easement		
Easement A Survey Office Plan 406586	Easement		
Part Lot 1 Deposited Plan 201385	Fee Simple Title	5.0085 Ha	
Easement B Survey Office Plan 406586	Easement		
Easement D Survey Office Plan 406586	Easement		
Easement E Survey Office Plan 406586	Easement		
Easement F Survey Office Plan 406586	Easement		
Section 7 Survey Office Plan 406586	Legalisation	2.2015 Ha	
Total Area		7.2100 Ha	

Fraser Thomas

- CONSULTING ENGINEERS
- RESOURCE MANAGERS
- ENVIRONMENTAL CONSULTANTS
- SURVEYORS & PLANNERS

FRASER THOMAS LIMITED
PHONE: +64 9 278 7078
WWW.fraserthomas.co.nz

Land Registration District

North Auckland

Plan Number

SO 406586

LAND TO BE SET APART FOR ELECTRICITY PURPOSES			
Shown	**Description**	**CT**	**Area**
Section 7	Part Lot 1 DP 201385	NA130A/437	2.2015ha

Fraser Thomas

- CONSULTING ENGINEERS
- RESOURCE MANAGERS
- ENVIRONMENTAL CONSULTANTS
- SURVEYORS & PLANNERS

FRASER THOMAS LIMITED
152 KOLMAR ROAD, PAPATOETOE
P.O. BOX 23 273, HUNTERS CORNER
AUCKLAND 2155, NEW ZEALAND
PHONE: +64 9 278 7078
FAX: +64 9 278 3697
www.fraserthomas.co.nz

Land Registration District

North Auckland

Plan Number

SO 406586

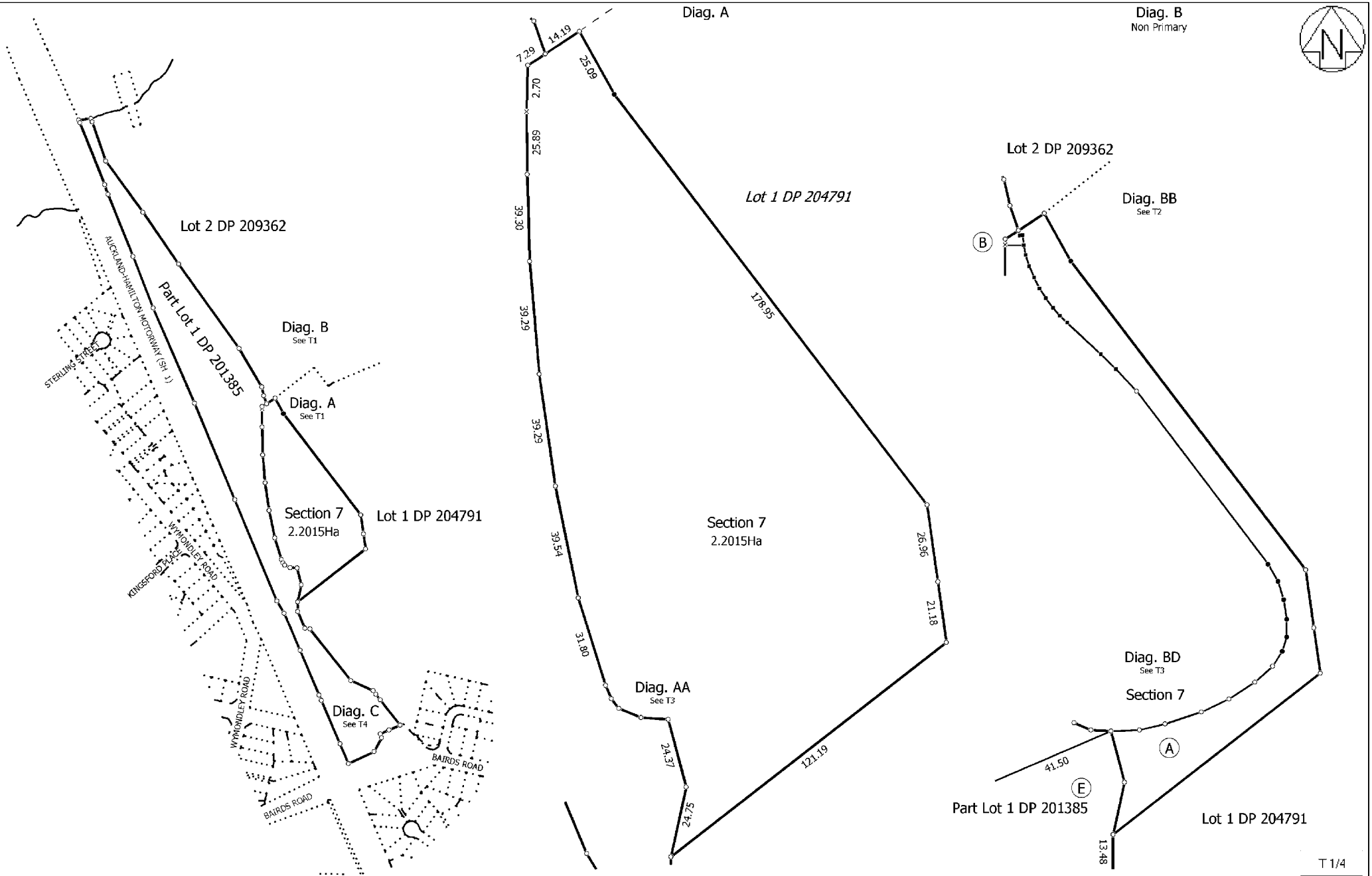
Territorial Authority (the Council)

MANUKAU CITY COUNCIL

Proposed Easements			
Purpose	**Shown**	**Servient Tenement**	**Dominant Tenement**
Right of way, water supply, sewerage & stormwater drainage and gas, electricity, telecommunications & liquid fuel supply	A	Section 7 Hereon	Lots 1 & 2 DP 209362 and Lot 1 DP 204791
	E	Part Lot 1 DP 201385	

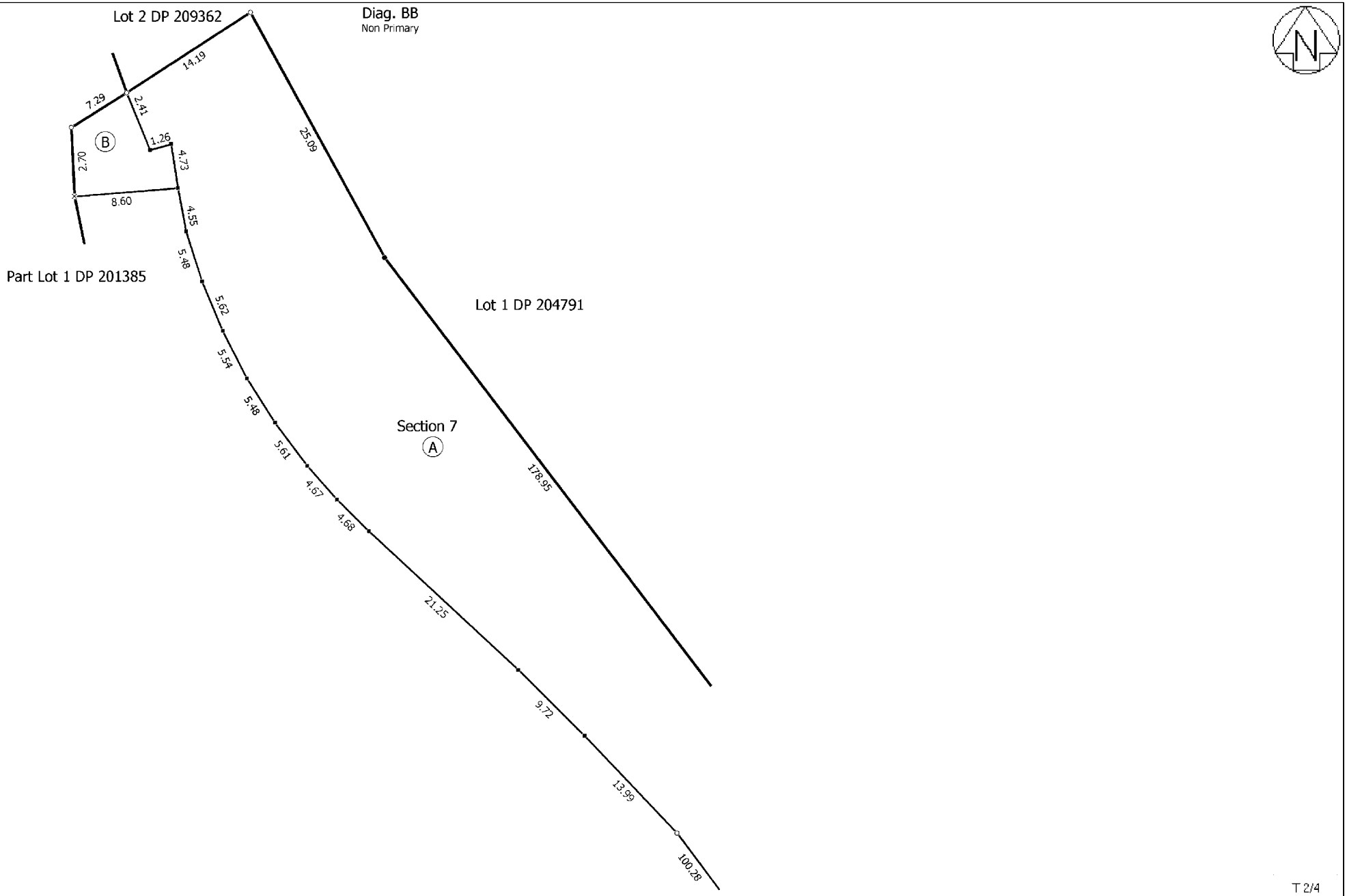
Proposed Easements in Gross			
Purpose	**Shown**	**Servient Tenement**	**Grantee**
Right of way	A	Section 7 Hereon	Manukau City Council
Right to convey water	A & B	Section 7 Hereon	Manukau Water Limited

Schedule of Existing Easements to Remain with the Land		
Purpose/Interest	**Shown/Document Number**	**Created By**
Right of way, water supply, sewerage & stormwater drainage and gas, electricity, telecommunications & liquid fuel supply	C & D	D533860.5
Electricity Supply	D & F	D693539.1
Noise, vibration and emission		D533860.6



151

Land District: North Auckland Digitally Generated Plan Generated on: 21/11/2008 07:11am Page 4 of 7	SECTION 7	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Digital Title Plan SO 406586 Approved on: 21/11/2008



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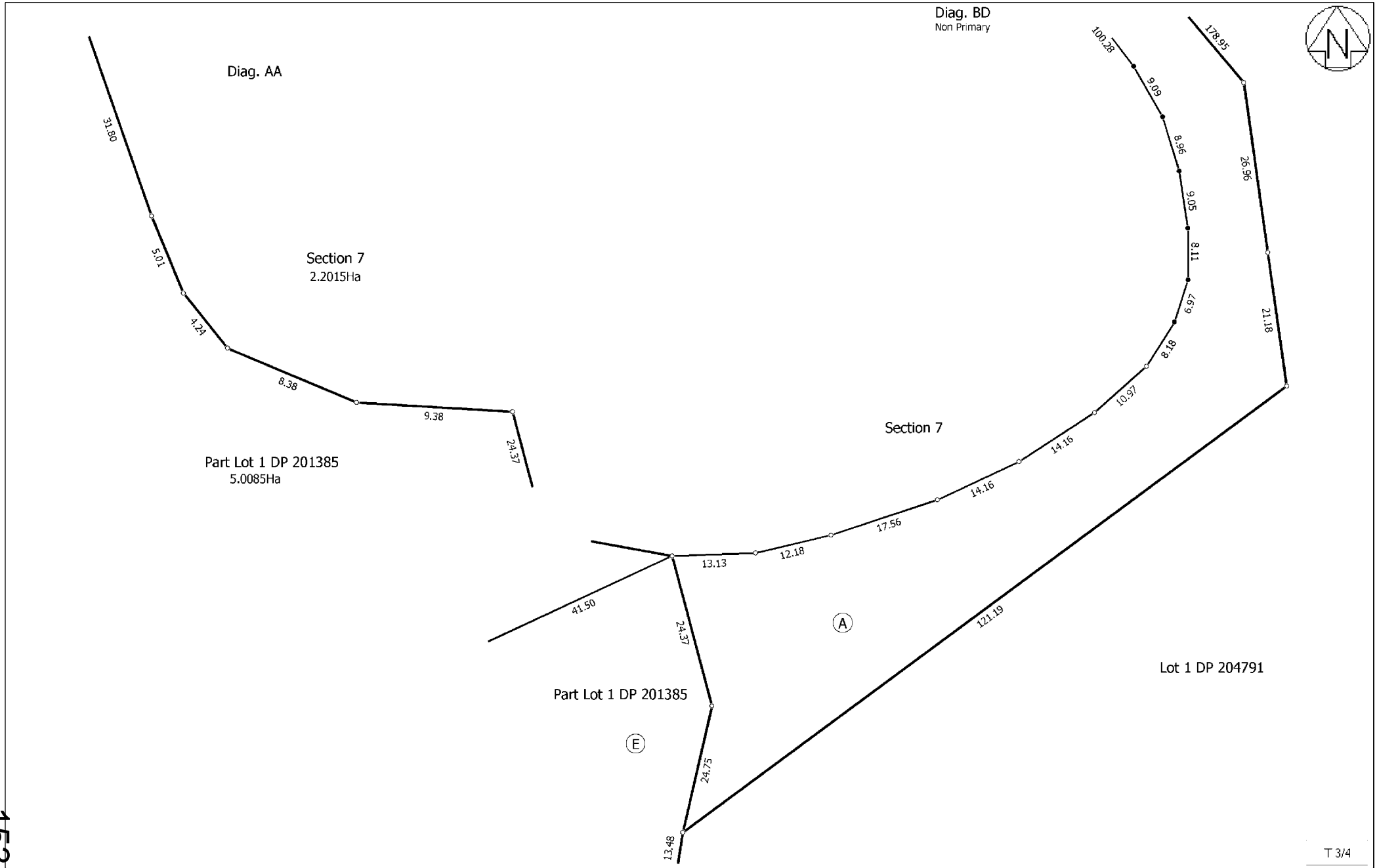
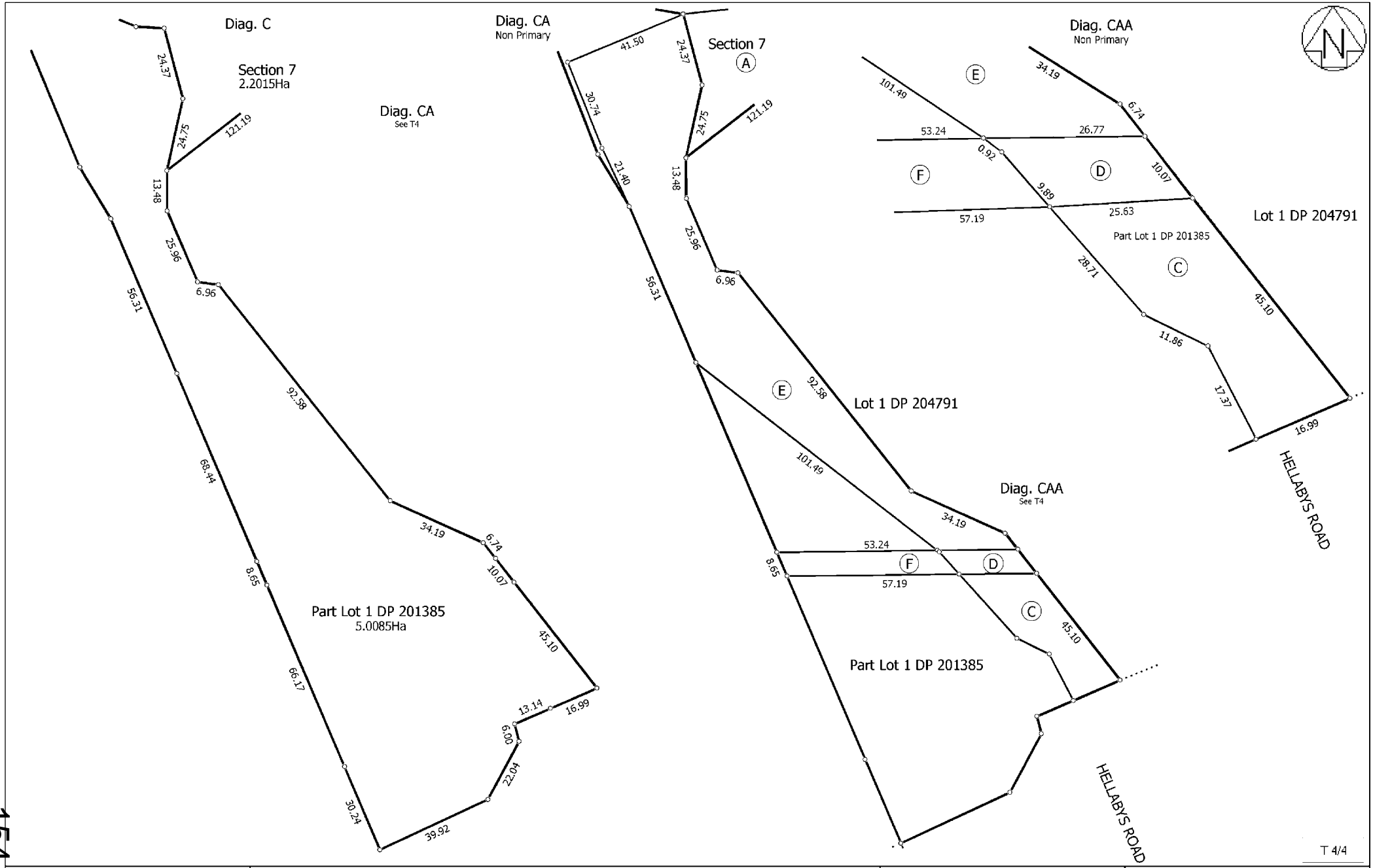
Land District: North Auckland Digitally Generated Plan Generated on: 21/11/2008 07:11am Page 5 of 7	SECTION 7	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Digital Title Plan SO 406586 Approved on: 21/11/2008



Land District: North Auckland Digitally Generated Plan Generated on: 21/11/2008 07:11am Page 6 of 7	SECTION 7	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Digital Title Plan SO 406586 Approved on: 21/11/2008



Land District: North Auckland Digitally Generated Plan Generated on: 21/11/2008 07:11am Page 7 of 7	SECTION 7	Surveyor: Gary Jackson Blyth Firm: Fraser Thomas Ltd (Auckland)	Digital Title Plan SO 406586 Approved on: 21/11/2008

91645 TE 01011870

Approved by the District Land Registrar, Auckland. No. 195.

New Zealand.

Memorandum of Transfer

Grant of Pt Lots 2 & another 3 Manurewa
Pt Lots 2 & 3 1824
with consent of mtge under mtge 245781

I ARTHUR LEWIS BURRETT of Auckland in the Provincial District of Auckland and Dominion of New Zealand Settler ....., being registered as proprietor of an estate in fee simple ——— subject, however, to such encumbrances, liens, and interests as are notified by memoranda underwritten or endorsed hereon, in th at piece of land containing Seventy one acres two roods and fifteen perches more or less being Lots Two and Three on a plan deposited in the Land Registry Office at Auckland under Number 10473 which said piece of land is part of the subdivision of Allotments ~~Two~~ Three and Four of the Parish of Manurewa and being part of the land comprised and described in Certificate of Title registered in Volume 247 folio 186 of the Register Book at Auckland aforesaid IN CONSIDERATION of the Body Corporate called the Inhabitants of the East Tamaki Road District consenting to the dedication of certain roads through parts of said Allotments Two Three and Four and of the sum of Five shillings paid to me by the said Body Corporate (the receipt of which sum I hereby acknowledge) DO HEREBY TRANSFER GIVE-AND-GRANT unto the said Body Corporate its successors and assigns the easement right and privilege of discharging water at any time through over ~~Do hereby transfer to the said~~

all estate and interest in the said piece of land above described

In witness whereof have hereunto subscribed name this

day of

Signed by the said

in the presence of

and along that piece of land two feet wide being part of said Lots Two ~~and Three~~ and extending from the culvert in the public road hereinafter mentioned and being bounded(commencing at the South Eastern corner of the public road dedicated by

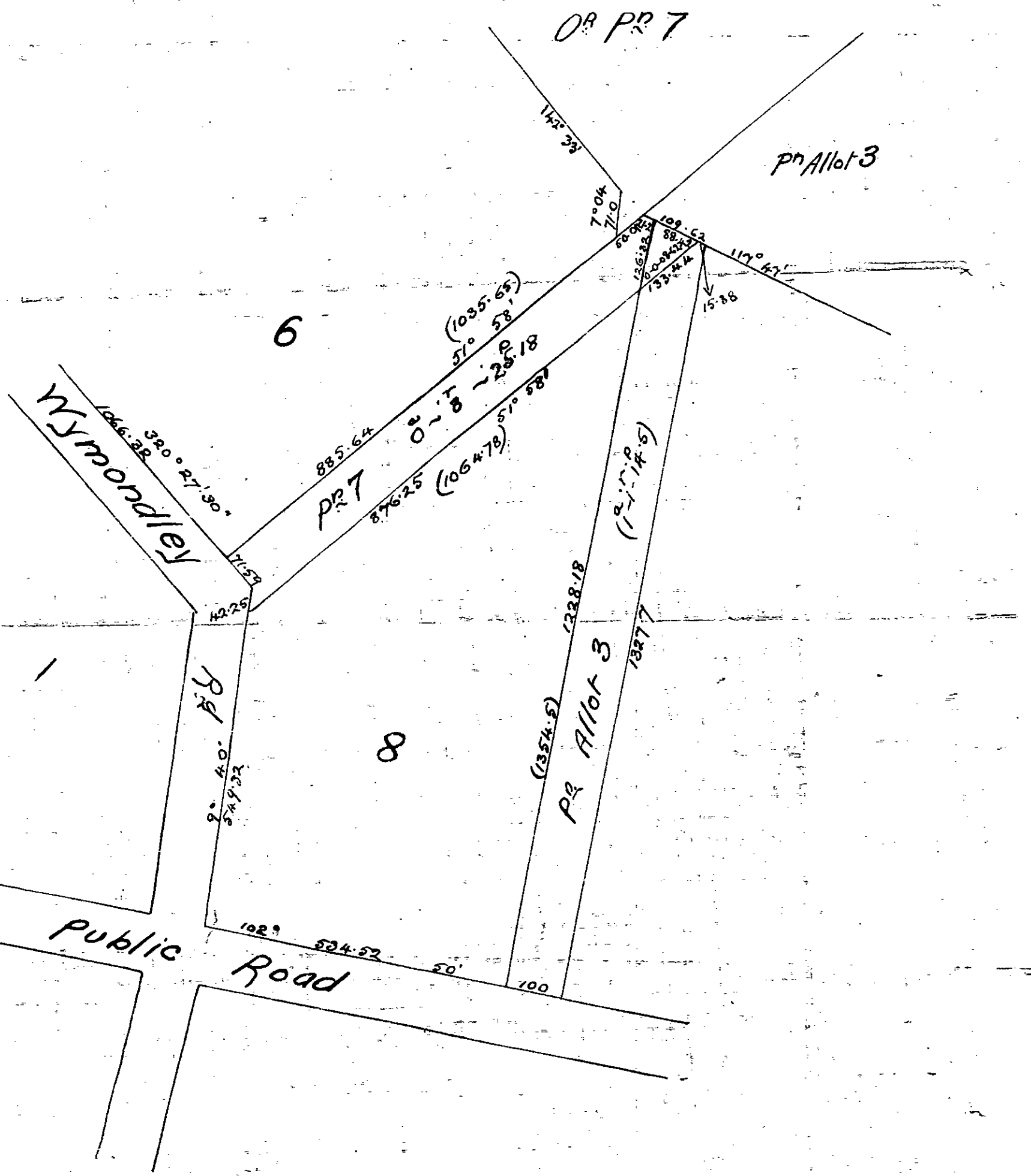
No. 9:8:4

Memorandum of Transfer dated the Nineteenth day of October One thousand nine hundred and fifteen from me to His Majesty the King of that piece of land containing One acre oneroad and fifteen perches more or less being part of the said subdivision of said Allotments Two Three and Four) towards the North West by the said public road Two feet and thence extending in a strip of land of a uniform width of two feet to the creek running through said Lot Two and shown on the plan drawn hereon and on said plan Number 10473 AS the said piece of land is delineated by the plan drawn hereon edged red and thence by means of the said creek to the sea AND for that purpose by its agents contractors servants and workmen to lay down pipes under the said piece of land and to raise and repair the same and to pass and repass along and across the said piece of land for the purpose of examining the said pipes and of cleaning out the same or any drain in or under the said piece of land AND in the exercise of the said easement right and privilege to do all things which the said Body Corporate shall reasonably from time to time deem necessary for the purpose of obtaining the fullest benefit and advantage of the same TO HOLD the same unto the said Body Corporate its successors and assigns for ever PROVIDED ALWAYS and I the said Arthur Lewis Burrett for myself and my assigns expressly covenant and agree with the said Body Corporate and its successors and assigns that the right privilege and easement hereby granted shall in no way entail or impose on the said Body Corporate any liability or responsibility for any damage or loss to the owner for the time being of Lots Two and Three aforesaid occasioned or incurred in any way whatsoever by the free or obstructed discharge or passage of water along or over the said piece of land above mentioned it being the intention of the parties that this covenant shall run with the above mentioned Lots Two and Three so as to bind hereunder the owner or owners for the time being of Lots Two and Three aforesaid and absolutely estop him or them of and from any right to claim damages against the Body Corporate or its successors in respect of any damage caused to Lots Two and Three aforesaid either from the free or obstructed discharge of water along or over the strip of land Two feet wide above described ———

IN WITNESS WHEREOF I have hereunto subscribed my name this 17th. day of December One thousand nine hundred and fifteen ———

SIGNED by the said ARTHUR LEWIS BURRETT) C. L. Burrett.
in the presence of ———) E. Macdermick Solicitor Auckland.

I GAVIN WALLACE of Otahuhu near Auckland aforesaid Settler the Mortgagee named and described in Deed of Mortgage registered in the Deeds Registry Office at Auckland aforesaid under Number 245781 affecting inter alia the above-mentioned piece of land IN CONSIDERATION of the sum of FIVE SHILLINGS paid to me by the above-named Arthur Lewis Burrett (the receipt of which sum I hereby acknowledge) DO HEREBY CONSENT to the foregoing Memorandum of Transfer and to the creation of the easement therein described and set forth ———



Plan of Pns of Allot 3 and Pn Lot 7 of Allot 3

Parish of Nanunerra

Scale:- 2 chains to an Inch

H Munro Nelson
Licensed Surveyor

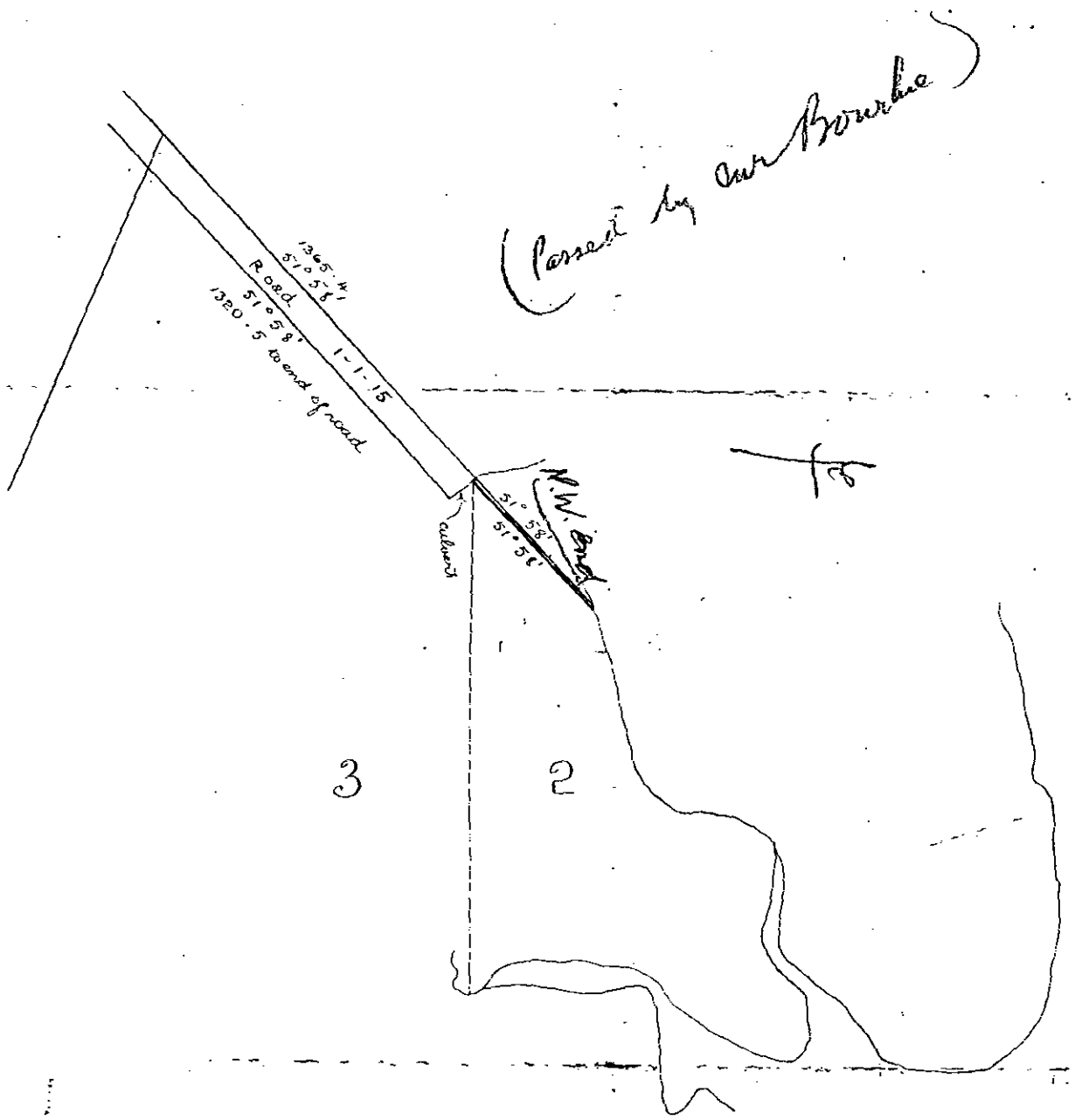
91645 - TE 0101 1870

IN WITNESS WHEREOF I have hereunto subscribed my name this 21st day of December One thousand nine hundred and fifteen .... ——————

SIGNED by the said GAVIN WALLACE in the presence of James A. Rinson J.P. Gavin Wallace

Jeweller
Dalhousie

(Passed by our Bourke)



No. [illegible]

Transfer of

ARTHUR L. BURRETT Vendor.

THE EAST TAMAKI ROAD BOARD Purchaser.

Particulars entered in the Register Book, Vol. 247 Fol/ 86

24th day of MARCH, 1916 at 2-48 o'clock. pm

[illegible signature]

Asst. District Land Registrar of the District of Auckland.

NORTH

4th
medm.
10473

17191
129 B 5-4

XRP_0032244

Correct for the purposes of the Land Transfer Act.

E. MacCormick
Solicitor
Auckland.

ALISON & ALISON & MacCORMICK
SOLICITORS
AUCKLAND

View Instrument Details

Instrument No.	8196392.3
Status	Registered
Date & Time Lodged	30 Oct 2009 15:11
Lodged By	Singleton, Kirsty Anne
Instrument Type	Easement Instrument

Affected Computer Registers	Land District
480534	North Auckland
NA125B/883	North Auckland
NA133B/131	North Auckland
NA137B/366	North Auckland
NA137B/367	North Auckland
NA93A/818	North Auckland

Annexure Schedule: Contains 9 Pages.

Grantor Certifications

I certify that I have the authority to act for the Grantor and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Julian Christopher Smith as Grantor Representative on 27/10/2009 12:37 PM

Grantee Certifications

I certify that I have the authority to act for the Grantee and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Julian Christopher Smith as Grantee Representative for Transpower New Zealand Limited on 27/10/2009 12:37 PM

Grantee Certifications

I certify that I have the authority to act for the Grantee and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

Grantee Certifications

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Lloyd Thomas Davies as Grantee Representative for Contact Energy Limited on 30/10/2009 08:55 AM

***** End of Report *****

Form B

Easement instrument to grant easement or *profit à prendre*, or create land covenant

(Sections 90A and 90F Land Transfer Act 1952)

Grantor

TRANSPOWER NEW ZEALAND LIMITED

Grantee

TRANSPOWER NEW ZEALAND LIMITED as registered proprietor of the land comprised in NA133B/131 and **CONTACT ENERGY LIMITED** as registered proprietor of the land comprised in NA137B/366, NA137B/367, NA93A/818 and NA125B/883

Grant of Easement or *Profit à prendre* or Creation of Covenant

The Grantor being the registered proprietor of the servient tenement(s) set out in Schedule A **grants to the Grantee** (and, if so stated, in gross) the easement(s) or *profit(s) à prendre* set out in Schedule A, **or creates** the covenant(s) **set out** in Schedule A, with the rights and powers or provisions set out in the Annexure Schedule(s)

Schedule A *Continue in additional Annexure Schedule, if required*

Purpose (Nature and extent) of easement; *profit* or covenant	Shown (plan reference)	Servient Tenement (Computer Register)	Dominant Tenement (Computer Register) or in gross
Right of way, water supply, sewage and stormwater drainage and gas, electricity telecommunications and liquid fuel supply	"A" on SO 406586	Section 7 SO 406586	(a) Lot 1 DP 209362 (NA137B/366) (b) Lot 2 DP 209362 (NA137B/367) (c) Lot 1 DP 204791 (NA133B/131) (d) Lot 1 DP 155980 (NA93A/818) (e) Sections 1, 2, 3, 4 SO 69716 (NA125B/883)

Form B - continued

Easements or *profits à prendre* rights and powers (including terms, covenants and conditions)

Delete phrases in [ ] and insert memorandum number as required; continue in additional Annexure Schedule, if required

Unless otherwise provided below, the rights and powers implied in specified classes of easement are those prescribed by the Land Transfer Regulations 2002 and/or Schedule Five of the Property Law Act 2007

The implied rights and powers are hereby **[varied]** **[~~negatived~~]** **[added to]** or **[~~substituted~~]** by:

~~[Memorandum number , registered under section 155A of the Land Transfer Act 1952]~~

[the provisions set out in Annexure Schedule]

Covenant provisions

Delete phrases in [ ] and insert Memorandum number as require; continue in additional Annexure Schedule, if required

The provisions applying to the specified covenants are those set out in:

~~[Memorandum number , registered under section 155A of the Land Transfer Act 1952]~~

[Annexure Schedule]

Form L

Annexure Schedule Page 3 of 4 Pages

Insert instrument type

Easement instrument to grant easement

Continue in additional Annexure Schedule, if required

Continuation of Interest or Easement to be created

The registered proprietor from time to time of the Servient Tenement shall not be liable to contribute towards the costs of the establishment, maintenance or repair of any right of way formed or to be formed on the Servient Tenement from time to time unless that registered proprietor or its servants, agents, workmen or tenants shall have caused damage to any such formed right of way.

If at any time the Dominant Tenement comprises more than one lot, the owners thereof shall share the costs of maintenance and repair of the rights created herein on the Servient Tenement equally PROVIDED that should any maintenance or repairs be required as consequence of the actions of one of such owners (and in the case of the Right of Way, the owner of the servient tenement) - whether directly or by their agents, servants or invitees, then such party shall be responsible for the cost of such repairs or maintenance.

The terms, covenants, conditions or restrictions set out below shall attach to the electricity, gas, liquid fuel and telecommunications easements specified herein.

ELECTRICITY, GAS, LIQUID FUEL AND TELECOMMUNICATIONS

(a) The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and its tenants (in common with the registered proprietor of the Servient Tenement, and its tenants, and any other person lawfully entitled so to do) from time to time and at all times to separately take, convey, and lead electrical current, gas, liquid fuel and/or telecommunications and computer media in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the Servient Tenement over which the easements are granted or created, together with:

(b) The full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement and its tenants (in common with the registered proprietor of the Servient Tenement its tenants, and any other person lawfully entitled to do so) for the purpose of the easements concerned:

i to use any cables and/or pipes already laid on the stipulated course or any cable or cables and/or pipe or pipes in replacement or in substitution for all or any of those cables and/or pipes;

ii where no such cables and/or pipes exist, to lay place, and maintain, or to have laid, placed and maintained cables and/or pipes of a sufficient size and of suitable material for the purpose under the surface of the Servient

Tenement over which the easements are granted or created;

iii In order to construct or maintain the efficiency of any such cable and/or pipe, the full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement, its tenants, servants, agents and workmen, with any tools, implements, machinery, vehicles, or equipment, of whatsoever nature necessary for the purpose to enter upon the Servient Tenement over which the easement is granted or created and to remain there for any reasonable time for the purpose of laying, inspection, cleansing, repairing, maintaining and renewing the cables, pipes, or other appurtenances thereto, or any part thereof and of opening up the soil of the Servient Tenement to such extent as may be necessary and reasonable in that regard, subject to the condition that as little disturbance as possible is caused to the surface of the land of the Servient Tenement and/or any day to day use thereof by persons lawfully entitled to do so, and that the surface of the land of the Servient Tenement is promptly restored as nearly as possible to its original condition and any other damage done by reason of the aforesaid operations is repaired.

The easements specified in this easement instrument shall be forever appurtenant to the Dominant Tenement.

Approved by Registrar-General of Land under No. 2003/6150

Annexure Schedule - Consent Form

Land Transfer Act 1952 section 238(2)

Registrar-General of Land Approval 03/6150EF A.D.L.S.

Insert type of instrument
"Caveat", "Mortgage" etc

Encumbrance

Page 1 of 2 pages

Consentor *Surname must be underlined or in CAPITALS*	**Capacity and Interest of Consentor** *(eg. Caveator under Caveat no./Mortgagee under Mortgage no.)*
Transpower New Zealand Limited	**Encumbrancee under Encumbrance Instrument D533860.7**

Consent

Delete Land Transfer Act 1952, if inapplicable, and insert name and date of application Act.
Delete words in [ ] if inconsistent with the consent.
State full details of the matter for which consent is required.

Pursuant to [section 238(2) of the Land Transfer Act 1952]

~~[section of the Act]~~

[Without prejudice to the rights and powers existing under the interest of the Consentor]

the **Consentor hereby consents** to:

Easement instrument creating a right of way, water supply, sewage and stormwater drainage and gas, electricity, telecommunications and liquid fuel supply over area "A" on SO 406586.

Dated this 17th day of June 2009

Attestation

Signed by the Consentor by its attorney David James Viviers **Signature of Consentor**	**Signed in my presence by the Consentor** **Signature of Witness** *Witness to complete in BLOCK letters (unless legibly printed)* **Witness name** **Occupation** Julian Christopher Smith Solicitor **Address** Wellington

An Annexure Schedule in this form may be attached to the relevant instrument, where consent is required to enable registration under the Land Transfer Act 1952, or other enactments, under which no form is prescribed.

REF: 7029 – AUCKLAND DISTRICT LAW SOCIETY

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

I, **DAVID JAMES VIVIERS, Property Manager**, of Wellington, hereby certify as follows:

That by deed dated 4th October 2004, **TRANSPOWER NEW ZEALAND LIMITED**, a duly incorporated company having its registered office at Wellington ("the Company"), appointed, as its attorneys in New Zealand, the persons then and from time to time holding certain offices within the Company (such offices being specified in the said deed), on the terms and subject to the conditions set out in the said deed.

That the said deed was deposited under **Power of Attorney Number 6209713.1** with the Registrar General of Land, pursuant to Section 151 Land Transfer Act 1952 on 9th November 2004.

That I hold the above-mentioned office specified in the said deed.

That, as the date hereof, I have not received any notice or information, actual or constructive, of the revocation of the said power of attorney either through the dissolution or winding up of **TRANSPOWER NEW ZEALAND LIMITED** or otherwise or of the cancellation or revocation of my appointment as attorney of the Company or otherwise.

SIGNED at Wellington this 17th day of June 2009.

DAVID JAMES VIVIERS
in the presence of:

Witness signature

Witness Name **Julian Christopher Smith**

Occupation **Solicitor**

City of Residence: **Wellington**

Approved by Registrar-General of Land under No. 2003/6150

Annexure Schedule - Consent Form

Land Transfer Act 1952 section 238(2)

Registrar-General of Land Approval 03/6150EF A.D.L.S.

Insert type of instrument
"Caveat", "Mortgage" etc

Encumbrance

Page 1 of 1 pages

Consentor *Surname must be underlined or in CAPITALS*	**Capacity and Interest of Consentor** *(eg. Caveator under Caveat no./Mortgagee under Mortgage no.)*
Contact Energy Limited	**Encumbrancee under Encumbrance Instrument D533860.7**

Consent

Delete Land Transfer Act 1952, if inapplicable, and insert name and date of application Act.
Delete words in [ ] if inconsistent with the consent.
State full details of the matter for which consent is required.

Pursuant to [section 238(2) of the Land Transfer Act 1952]

~~[section of the Act]~~

[Without prejudice to the rights and powers existing under the interest of the Consentor]

the **Consentor hereby consents** to:

Easement instrument creating a right of way, water supply, sewage and stormwater drainage and gas, electricity, telecommunications and liquid fuel supply over area "A" on SO 406586.

Dated this 1st day of July 2009

Attestation

MARK DESMOND TERRY, ATTORNEY **Signature of Consentor** SAJAN ARTHUNKAL, ATTORNEY	**Signed in my presence by the Consentor** **Signature of Witness** *Witness to complete in BLOCK letters (unless legibly printed)* **Witness name** William Brian Barnes **Occupation** Solicitor **Address** Wellington

An Annexure Schedule in this form may be attached to the relevant instrument, where consent is required to enable registration under the Land Transfer Act 1952, or other enactments, under which no form is prescribed.

REF: 7029 – AUCKLAND DISTRICT LAW SOCIETY

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

We, MARK DESMOND TEWS , and
SUSAN CATHERINE GRAD , both of Wellington, certify:

1. **THAT** by Deed dated **8 October 2008**, Contact Energy Limited appointed us its attorneys.

2. **THAT** a copy of that Deed has been deposited with the Registrar-General of Land under number **807572**.

3. **THAT** we have not received notice of any event revoking the power of attorney.

SIGNED at Wellington, this 1st day of July 2009

MANUKAU CITY COUNCIL

RESOLUTION PURSUANT TO SECTION 348 OF

THE LOCAL GOVERNMENT ACT 1974

The Manukau City Council hereby approves pursuant to Section 348 of the Local Government Act 1974 the Rights of Way 'A' as shown on Survey Office Plan Number 406586.

Purpose	Shown	Servient tenement	Dominant tenements
Right of way (and other types of easements)	'A' on SO 406586	Section 7 SO 406586	Lot 1 DP209362 (NA137B/366) Lot 2 DP209362 (NA137B/367) Lot 1 DP204791 (NA133B/131) Lot 1 DP155980 (NA93A/818) Sections 1, 2, 3, 4 on SO 69716 (NA125B/883)
Right of way (in gross)	'A' on SO 406586	Section 7 SO 406586	Manukau City Council

Dated at Manukau City this 18th day of June 2009.

The Common Seal of
THE MANUKAU CITY COUNCIL
was hereto affixed in the presence of:

R.H-Low.

Z I TANG

Authorised officer under delegated authority

RCP-041 (2)
Dec-06 / Page 1 of 1

View Instrument Details

Instrument No.	8196479.1
Status	Registered
Date & Time Lodged	30 Oct 2009 15:12
Lodged By	Singleton, Kirsty Anne
Instrument Type	Easement Instrument

Affected Computer Registers	Land District
480534	North Auckland
NA125B/883	North Auckland
NA133B/131	North Auckland
NA137B/366	North Auckland
NA137B/367	North Auckland
NA93A/818	North Auckland

Annexure Schedule: Contains 5 Pages.

Grantor Certifications

I certify that I have the authority to act for the Grantor and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Julian Christopher Smith as Grantor Representative on 27/10/2009 12:42 PM

Grantee Certifications

I certify that I have the authority to act for the Grantee and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Julian Christopher Smith as Grantee Representative for Transpower New Zealand Limited on 27/10/2009 12:42 PM

Grantee Certifications

I certify that I have the authority to act for the Grantee and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

Grantee Certifications

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

Signature

Signed by Lloyd Thomas Davies as Grantee Representative for Contact Energy Limited on 30/10/2009 08:58 AM

***** End of Report *****

Form B

Easement instrument to grant easement or *profit à prendre*, or create land covenant

(Sections 90A and 90F Land Transfer Act 1952)

Grantor

TRANSPOWER NEW ZEALAND LIMITED

Grantee

CONTACT ENERGY LIMITED as registered proprietor of the land comprised in NA137B/366, NA137B/367, NA93A/818 and NA125B/883 and **TRANSPOWER NEW ZEALAND LIMITED** as registered proprietor of the land comprised in Section 7 SO 406586

Grant of Easement or *Profit à prendre* or Creation of Covenant

The Grantor being the registered proprietor of the servient tenement(s) set out in Schedule A **grants to the Grantee** (and, if so stated, in gross) the easement(s) or *profit(s) à prendre* set out in Schedule A, **or creates** the covenant(s) **set out** in Schedule A, with the rights and powers or provisions set out in the Annexure Schedule(s)

Schedule A *Continue in additional Annexure Schedule, if required*

Purpose (Nature and extent) of easement; *profit* or covenant	Shown (plan reference)	Servient Tenement (Computer Register)	Dominant Tenement (Computer Register) or in gross
Right of way, water supply, sewage and stormwater drainage and gas, electricity telecommunications and liquid fuel supply	"G" on DP 420711	Lot 1 DP 204791 (NA133B/131)	(a) Lot 1 DP 209362 (NA137B/366) (b) Lot 2 DP 209362 (NA137B/367) (c) Section 7 SO 406586 (d) Lot 1 DP 155980 (NA93A/818) (e) Sections 1, 2, 3, 4 SO 69716 (NA125B/883)

118305882

Form B - continued

Easements or *profits à prendre* rights and powers (including terms, covenants and conditions)

Delete phrases in [ ] and insert memorandum number as required; continue in additional Annexure Schedule, if required

Unless otherwise provided below, the rights and powers implied in specified classes of easement are those prescribed by the Land Transfer Regulations 2002 and/or Schedule Five of the Property Law Act 2007

The implied rights and powers are hereby **[varied]** **[~~negatived~~]** **[added to]** or [**substituted**] by:

~~[Memorandum number , registered under section 155A of the Land Transfer Act 1952]~~

[the provisions set out in Annexure Schedule]

Covenant provisions

Delete phrases in [ ] and insert Memorandum number as require; continue in additional Annexure Schedule, if required

The provisions applying to the specified covenants are those set out in:

~~[Memorandum number , registered under section 155A of the Land Transfer Act 1952]~~

[Annexure Schedule]

Form L

Annexure Schedule Page 3 of 4 Pages

Insert instrument type

Easement instrument to grant easement

Continue in additional Annexure Schedule, if required

Continuation of Interest or Easement to be created

The registered proprietor from time to time of the Servient Tenement shall not be liable to contribute towards the costs of the establishment, maintenance or repair of any right of way formed or to be formed on the Servient Tenement from time to time unless that registered proprietor or its servants, agents, workmen or tenants shall have caused damage to any such formed right of way.

If at any time the Dominant Tenement comprises more than one lot, the owners thereof shall share the costs of maintenance and repair of the rights created herein on the Servient Tenement equally PROVIDED that should any maintenance or repairs be required as consequence of the actions of one of such owners (and in the case of the Right of Way, the owner of the servient tenement) - whether directly or by their agents, servants or invitees, then such party shall be responsible for the cost of such repairs or maintenance.

The terms, covenants, conditions or restrictions set out below shall attach to the electricity, gas, liquid fuel and telecommunications easements specified herein.

ELECTRICITY, GAS, LIQUID FUEL AND TELECOMMUNICATIONS

(a) The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and its tenants (in common with the registered proprietor of the Servient Tenement, and its tenants, and any other person lawfully entitled so to do) from time to time and at all times to separately take, convey, and lead electrical current, gas, liquid fuel and/or telecommunications and computer media in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the Servient Tenement over which the easements are granted or created, together with:

(b) The full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement and its tenants (in common with the registered proprietor of the Servient Tenement its tenants, and any other person lawfully entitled to do so) for the purpose of the easements concerned:

i to use any cables and/or pipes already laid on the stipulated course or any cable or cables and/or pipe or pipes in replacement or in substitution for all or any of those cables and/or pipes;

ii where no such cables and/or pipes exist, to lay place, and maintain, to have laid, placed and maintained cables and/or pipes of a sufficient size and of suitable material for the purpose under the surface of the Servient Tenement over which the easements are granted or created;

iii	In order to construct or maintain the efficiency of any such cable and/or pipe, the full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement, its tenants, servants, agents and workmen, with any tools, implements, machinery, vehicles, or equipment, of whatsoever nature necessary for the purpose to enter upon the Servient Tenement over which the easement is granted or created and to remain there for any reasonable time for the purpose of laying, inspection, cleansing, repairing, maintaining and renewing the cables, pipes, or other appurtenances thereto, or any part thereof and of opening up the soil of the Servient Tenement to such extent as may be necessary and reasonable in that regard, subject to the condition that as little disturbance as possible is caused to the surface of the land of the Servient Tenement and/or any day to day use thereof by persons lawfully entitled to do so, and that the surface of the land of the Servient Tenement is promptly restored as nearly as possible to its original condition and any other damage done by reason of the aforesaid operations is repaired.

The easements specified in this easement instrument shall be forever appurtenant to the Dominant Tenement.

MANUKAU CITY COUNCIL

RESOLUTION PURSUANT TO SECTION 348 OF

THE LOCAL GOVERNMENT ACT 1974

The Manukau City Council hereby approves pursuant to Section 348 of the Local Government Act 1974 the Rights of Way G as shown on Land Transfer Plan 420711.

Purpose	Shown	Servient tenement	Dominant tenements
Right of way (and other types of easements)	'G' on LT420711	Lot 1 DP204791 (CT NA133B/131)	Lot 1 DP209362 (NA137B/366) Lot 2 DP209362 (NA137B/367) Section 7 SO 406585 Lot 1 DP155980 (NA93A/818) Sections 1, 2, 3, 4 on SO 69716 (NA125B/883)
Right of way (in gross)	'G' on LT420711	Lot 1 DP204791 (CT NA133B/131)	Manukau City Council

Dated at Manukau City this 18th day of June 2009.

The Common Seal of
THE MANUKAU CITY COUNCIL
was hereto affixed in the presence of:

R.H. Low

T J TANG

Authorised officer under delegated authority

RCP-041 (2)
Dec-06 / Page 1 of 1

595037 TE 01011870

11/-

29/8/1:36 07

AUCKLAND

(Approved by the District Land Registrar, Auckland, No. 2716)

New Zealand] (C)

Under the Land Transfer Act, 1952

Memorandum of Transfer

WHEREAS THE AUCKLAND CITY BUILDINGS LIMITED a duly incorporated Company carrying on business in Auckland (hereinafter referred to as "the Grantor") is .. .. being registered as proprietor of an estate in fee simple . .. .

subject however to such encumbrances, liens and interests as are notified by memoranda underwritten or endorsed hereon in that piece of land situated in the Land District of Auckland containing SEVENTY-THREE ACRES . . THREE ROODS FIFTEEN PERCHES (73a. 3r. 15p) .. .. more or less being residue of Deposited Plan No.10426 and being portions of Allotments 2 3 and 4 of the Parish of Manurewa and the residue . of the land comprised in and described by Certificate of Title . . Volume 247 Folio 186 Auckland Registry SUBJECT to Drainage Rights over Lot 2 Deposited Plan 10473 in favour of East Tamaki Road . . . District created by Transfer 91645 and to Proclamation 12807 (revoked) defining the middle line of a Motorway.

AND WHEREAS the Grantor has agreed to grant an easement in gross to the AUCKLAND ELECTRIC POWER BOARD a Body Corporate duly constituted under the provisions of the Auckland Electric Power Board Act . . . 1921-22 (hereinafter called "the Grantee") to enable the Grantee . to instal electric power lines along that portion of the said land hereinafter mentioned.

NOW THEREFORE in pursuance of the said Agreement and in consideration of the premises the Grantor DOTH HEREBY TRANSFER AND GRANT . unto the Grantee as an easement in gross the full and free right . liberty and license to transmit along that portion of the said land delineated by the plan endorsed hereon and thereon coloured yellow electric current through such wires as may be necessary and for .. that purpose from time to time as occasion shall require and with . men horses carts vehicles and material to go upon that portion of the said land above described coloured yellow on the plan endorsed hereon and to erect poles and wires thereon and to repair and re- .

~~In consideration of~~

~~(the receipt of which sum is hereby acknowledged)~~

~~Do hereby Transfer to the said~~

~~all estate and interest in the said piece of land above described~~

new or remove any of such poles or wires and to view the state or condition thereof.

PROVIDED THAT all damage done to the surface of the said portion of the said land and any fences or other erections thereon shall be made good and remedied in a proper and workmanlike manner to the Grantor's satisfaction.

AND ~~PROVIDED~~ that any opening in such land shall be filled in as soon as possible after the necessary work for which such opening was made has been completed and the surface levelled off in a proper manner and restored to its former condition to the Grantor's satisfaction and all damage (if any) to fences or other erections made good and remedied in a proper and workmanlike manner to the Grantor's satisfaction.

AND PROVIDED that every care shall be exercised to prevent stock from being injured or escaping from the said land

~~In witness whereof~~ have ~~hereunto subscribed~~ name ~~this~~ ~~day of~~ ~~one thousand nine hundred and~~

~~Signed by the above named~~

~~in the presence of~~

AND PROVIDED ALSO that if and whenever the said Company or its successors in title subdivides the said land the power poles shall if required by them be removed to a position on the boundary or frontage of a section so that the erection of a building on such section shall not be obstructed.

IN WITNESS WHEREOF these presents have been executed this 28th day of August One thousand nine hundred and fifty-seven....

THE COMMON SEAL of AUCKLAND CITY BUILDINGS LIMITED was hereunto affixed in the presence of:-

.....) DIRECTORS

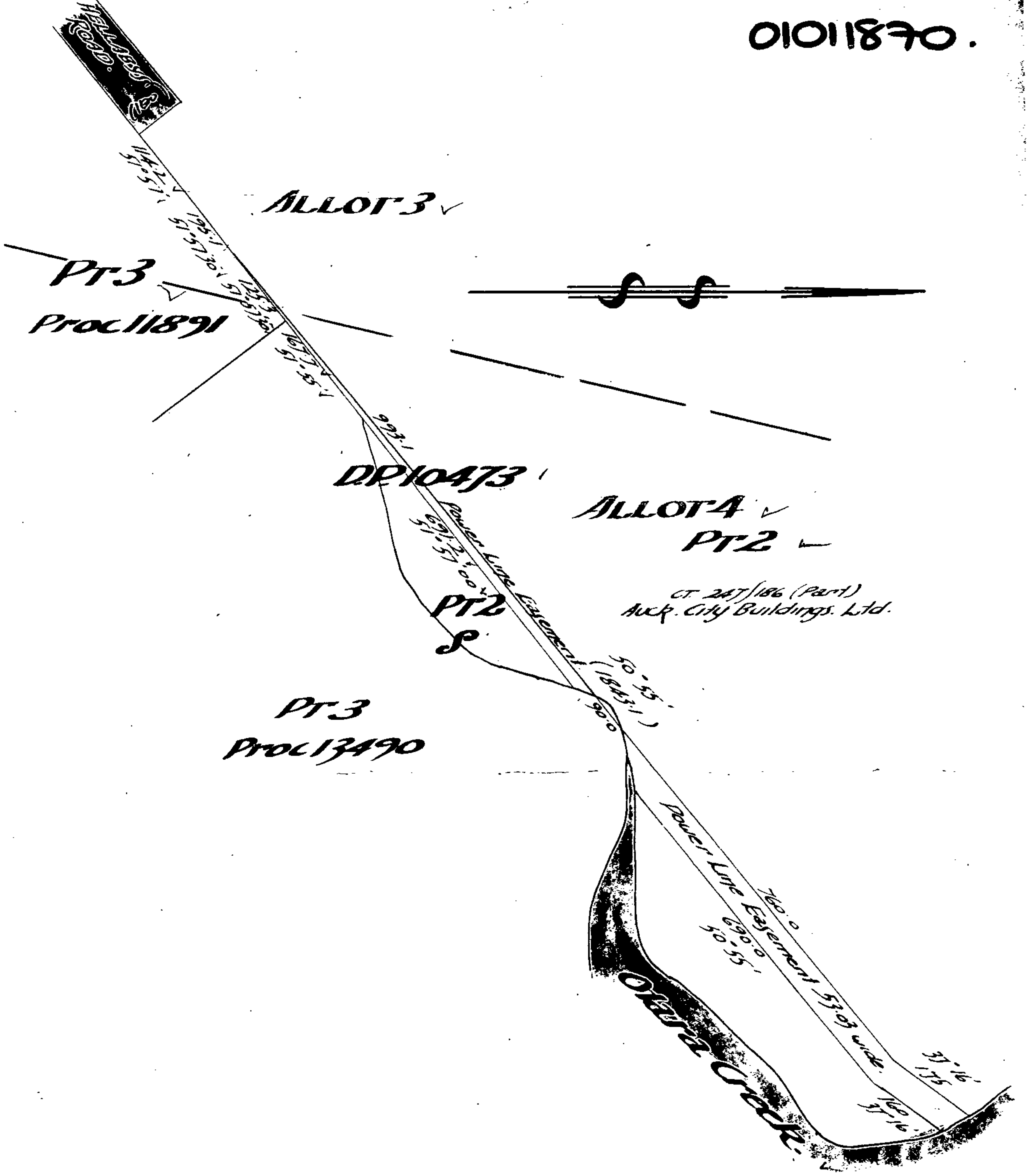
.....)

.....) SECRETARY

THE AUCKLAND CITY BUILDINGS LIMITED COMMON SEAL OF

595037 TE

01011870.



PLAN OF POWER LINE EASEMENT THROUGH PART LOT 2 ON DP 10473 BEING PART ALLOTS. 3 & 4 MANUREWA PARISH.

SCALE: 2 Chains = 1 inch.

Correct
Draughtsman,
21/10/57

W.E. Griffiths
Regd. Surveyor.

Print by
JAS. S. LOCKLEY LTD.
159 Queen Street · AUCKLAND
PLAN PRINTING * PHOTOCOPYING

595037

No.

Correct for the purposes of the Land Transfer Act.

TRANSFER OF Easement over residue D.P.10426 ptn Allots 2,3,4 Parish of Manurewa C.T.247/186

Solicitor for the Transferee

AUCKLAND CITY BUILDINGS LIMITED Grantor ~~Transferor~~

REGISTERED IN TRIPLICATE

AUCKLAND ELECTRIC POWER BOARD Grantee ~~Transferee~~

LT 1.

Please amend D.P. 12400 B

Particulars entered in the Register-Book

247/186

the 14th day of October 1957

at 11 o'clock

(Amendments of D.P. 12807 & 13209 to be endorsed)

Assistant ~~District~~ Land Registrar of the District of Auckland.

33163

130 A 2-3

XRP_0032241

LAND & DEEDS

Nature: T Easement

Firm: Nicholson G

14 OCT 1957

Time: 11 26

Fee: £ 1 : 2 :

Abstract No. 7297

NICHOLSON, GRIBBIN, ROGERSON & NICHOLSON,

SOLICITORS,

AUCKLAND.

Solicitors for the Transferee

THE LAW SOCIETY OF THE DISTRICT OF AUCKLAND

A.D. 71359

D 533860.6TE

TRANSFER

Land Transfer Act 1952

This page does not form part of the Transfer.

TRANSFER

Land Transfer Act 1952

If there is not enough space in any of the panels below, cross-reference to and use the approved Annexure Schedule: no other format will be received.

Land Registration District

NORTH AUCKLAND

Certificate of Title No.	All or Part?	Area and legal description — ***Insert only when part or Stratum; CT***
130A 437	ALL	

Transferor *Surnames must be underlined*

The Manukau City Council

Transferee *Surnames must be underlined*

Her Majesty the Queen (acting by and through the Minister of Lands pursuant to section 28 of the Public Works Act 1981).

Estate or Interest or Easement to be created: *Insert e.g. Fee simple; Leasehold in Lease No. .....; Right of way etc.*

Easements as specified in the attached annexure schedule.

Consideration

$1-00

Operative Clause

For the above consideration (receipt of which is acknowledged) the TRANSFEROR TRANSFERS to the TRANSFEREE all the transferor's estate and interest described above in the land in the above Certificate(s) of Title and if an easement is described above such is granted or created.

Dated this 4th **day of** August 2000

Attestati

Signed in my presence by the Transferor
Signature of Witness

Witness to complete in BLOCK letters
(unless typewritten or legibly stamped)

Witness name

Occupation

Address

Mayor

City Manager

feror

Certifie purposes of the Land Transfer Act 1952

Certified that no conveyance duty is payable by virtue of Section 24(1) of the Stamp and Cheque Duties Act 1971.
(DELETE INAPPLICABLE CERTIFICATE)

Solicitor for the Transferee

REF 4135

1. Interpretation

"The servient Tenement" means the land identified on the first page of this transfer.

"The Dominant Tenement" or the "Otahuhu ~~Substation~~ Power Station Land" means an estate in fee simple in all that parcel of land containing more or less 57.8370 hectares being Lot 1 on Deposited Plan 203790 being all the land contained in Certificate of Title 132B/642 (North Auckland Registry).

2. Background

(a) The Servient Tenement is situated adjacent to the Otahuhu Power Station Land

(b) Noise generation, vibration, emissions and/or deposits of matter including without limitation electromagnetic fields, waves or current or geomagnetically induced currents, traffic, adverse visual impact of electricity works or other adverse industrial impact are an unavoidable effect of the carrying on of electricity generation and supply operations on or about the Otahuhu Power Station Land.

(c) The Transferee sold the surplus Otahuhu Power Station Land to the Transferor upon the basis that owners, occupiers or persons having an interest in the Servient Tenement would not be able to use their interest in the Servient Tenement to object to, obstruct or hinder the carrying on of electricity generation and supply operations on or about the Otahuhu ~~Substation~~ Power Station Land.

(d) The Transferor has agreed to grant the within easements to the Transferee and to enter into a certain memorandum of encumbrance of even date herewith with the intention that such encumbrance apply in conjunction with this transfer.

3. Easements

The Transferor transfers and grants to the ~~Grantee~~ Transferee the full, free, uninterrupted and unrestricted right, liberty and privilege for the ~~Grantee~~ Transferee and it's servants, tenants, agents licensees and grantees from time to time by carrying on electricity generation and supply operations upon or about the Otahuhu Power Station Land to thereby also use and affect the Servient Tenement including it's subsoil and it's airspace by emanating noise to the Servient Tenement, causing vibrations of the Servient Tenement, allowing emissions from or incidental to the said electricity generation and supply operations carried on from time to time on or about the Otahuhu Power Station Land to escape, pass over, settle on or deposit as the case may be on or about the Servient Tenement including without limitation electromagnetic fields, waves or current or geomagnetically induced currents, (and whether caused by increased traffic flows in the proximity of the Servient Tenement or any other activity that adversely affects the servient Tenement generally and/or through the visual impact thereon of electricity works on or about the Otahuhu Power Station Land), to the intent that this easement shall be forever appurtenant to the Otahuhu Power Station Land.

~~SIGNED BY MANUKAU~~)
CITY COUNCIL)

In the presence of:

.....

.....

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Approved by Registrar-General
of Land under No. 1995/1004

TRANSFER

Land Transfer Act 1952

PRODUCED
ENTERED
9.00 21.AUG00 D 533860.6
9.00 1.9.00
PARTICULARS ENTERED IN REGISTER
LAND REGISTRY OFFICE
for REGISTRAR-GENERAL OF LAND

NZ COPY

Law Firm Acting

Auckland District Law Society
REF: 4135

This page is for Land Registry Office use only.
(except for "Law Firm Acting")

D533860.5TE

TRANSFER

Land Transfer Act 1952

This page does not form part of the Transfer.

TRANSFER

Land Transfer Act 1952

If there is not enough space in any of the panels below, cross-reference to and use the approved Annexure Schedule: no other format will be received.

Land Registration District

NORTH AUCKLAND

Certificate of Title No.	All or Part?	Area and legal description — *Insert only when part or Stratum, CT*
130A 437	PART	"A", "B" and "C" on DP 201385

Transferor *Surnames must be underlined*

THE MANUKAU CITY COUNCIL

Transferee *Surnames must be underlined*

HER MAJESTY THE QUEEN (acting through the Minister of Lands pursuant to section 28 of the Public Works Act 1981).

Estate or Interest or Easement to be created: *Insert e.g. Fee simple; Leasehold in Lease No. .....; Right of way etc.*

Easements of Right of Way, right to drain sewage, right to drain waste water, right to convey water, right to convey electricity, right to convey communications, right to convey gas, right to convey liquid fuel (continued on page 2 of annexure schedule).

Consideration

$1-00

Operative Clause

For the above consideration (receipt of which is acknowledged) the TRANSFEROR TRANSFERS to the TRANSFEREE all the transferor's estate and interest described above in the land in the above Certificate(s) of Title and if an easement is described above such is granted or created.

Dated this 4th **day of** August 2000

Attestation

Signed in my presence by the Transferor
Signature of Witness

Witness to complete in BLOCK letters
(unless typewritten or legibly stamped)

Witness name

Occupation

Address

Mayor

City Manager

...nsferor

Certified correct for the purposes of the Land Transfer Act 1952

Certified that no conveyance duty is payable by virtue of Sect on 24(1) of the Stamp and Cheque Duties Act 197[illegible]
(DELETE INAPPLICABLE CERTIFICATE)

Solicitor for the Transferee

REF 4135

Annexure Schedule

Insert below "Mortgage", "Transfer", "Lease" etc

Transfer | Dated 4th August 2000 | Page 2 of 3 Pages

Continuation of Interest or Easement to be created

The Transferor HEREBY TRANSFERS AND GRANTS to the Transferee the easements specified in this Transfer in and under such parts of the land marked "A", "B" and "C" in DP 201385 "the Servient Tenement".

The rights and powers set out in the Seventh Schedule to the Land Transfer Act 1952 and the rights and powers set out in the Ninth Schedule to the Property Law Act 1952 are herein implied but subject to the proviso that the registered proprietor from time to time of the Servient Tenement shall not be liable to contribute towards the cost of the establishment, maintenance or repair of any right of way formed or to be formed on the Servient Tenement from time to time unless that registered proprietor or its servants, agents, workmen or tenants shall have caused damage to any such formed right of way.

If at any time the Dominant Tenement comprises more than one lot, the owners thereof shall share the costs of maintenance and repair of the rights created herein on the Servient Tenement equally PROVIDED that should any maintenance or repairs be required as consequence of the actions of one of such owners (and in the case of the Right of Way, the owner of the servient tenement) –whether directly or by their agents ,servants or invitees, then such party shall be responsible for the cost of such repairs or maintenance.

The terms, covenants, conditions or restrictions set out below shall attach to the electricity, gas, liquid fuel and communications easements specified herein.

ELECTRICITY, GAS, LIQUID FUEL AND COMMUNICATIONS

a. The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, and his tenants, and any other person lawfully entitled so to do) from time to time and at all times to separately take, convey, and lead electrical current, gas, liquid fuel and/or communications in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the Servient Tenement over which the easements are granted or created, together with:

b. The full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, his tenants, and any other person lawfully entitled to do so) for the purpose of the easements concerned:

   i. To use any cables and/or pipes already laid on the stipulated course or any cable or cables and/or pipe or pipes in replacement or in substitution for all or any of those cables and/or pipes;

   ii. Where no such cables and/or pipes exist, to lay place, and maintain, cables and/or pipes of a sufficient size and of suitable material for the purpose under the surface of the Servient Tenement over which the easements are granted or created.

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

iii. In order to construct or maintain the efficiency of any such cable and/or pipe, the full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement, his tenants, servants, agents and workmen, with any tools, implements, machinery, vehicles, or equipment, of whatsoever nature necessary for the purpose to enter upon the Servient Tenement over which the easement is granted or created and to remain there for any reasonable time for the purpose of laying, inspection, cleansing, repairing, maintaining and renewing the cables, pipes, or other appurtenances thereto, or any part thereof and of opening up the soil of the Servient Tenement to such extent as may be necessary and reasonable in that regard, subject to the condition that as little disturbance as possible is caused to the surface of the land of the Servient Tenement and/or any day to day use thereof by persons lawfully entitled to do so, and that the surface of the land of the Servient Tenement is promptly restored as nearly as possible to its original condition and any other damage done by reason of the aforesaid operations is repaired.

The easements specified in this transfer shall be forever appurtenant to the land of the Transferee being Lot 1 on DP 203790 contained in Certificate of Title 132B/642 North Auckland Registry.

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Approved by Registrar-General
of Land under No. 1995/1004

TRANSFER

Land Transfer Act 1952

LINZ COPY

PRODUCED
ENTERED 9.00 21.AUG00 D 533860.5

9.00 1.9.00

PARTICULARS ENTERED IN THE REGISTRAR-GENERAL'S
LAND REGISTRY OFFICE AT AUCKLAND
for REGISTRAR-GENERAL OF LAND

130A/437
132B/642

Law Firm Acting

Auckland District Law Society
REF 4135

This page is for Land Registry Office use only.
(except for "Law Firm Acting")

D640353.5TE

TRANSFER
Land Transfer Act 1952

If there is not enough space in any of the panels below, cross-reference to and use the approved Annexure Schedule: no other format will be received.

Land Registration District
NORTH AUCKLAND

Certificate of Title No.	All or Part?	Area and legal description – *Insert only when part or Stratum, CT*
~~122B~~ 133B ~~814~~ 131	PART	~~Accessway Deposited Plan 193313~~ D on DP204791

Transferor *Surnames must be underlined or in CAPITALS*
TRANSPOWER NEW ZEALAND LIMITED

Transferee *Surnames must be underlined or in CAPITALS*
CONTACT ENERGY LIMITED

Estate or Interest or Easement to be created: *Insert e.g. Fee simple; Leasehold in Lease No .....; Right of way etc.*
Easements of Right of Way, right to drain sewage, right to drain waste water, right to convey water, right to convey electricity, right to convey communications, right to convey gas, right to convey liquid fuel (continued on page 2 of annexure schedule).

Consideration
$1.00

Operative Clause

For the above consideration (receipt of which is acknowledged) the TRANSFEROR TRANSFERS to the TRANSFEREE all the transferor's estate and interest described above in the land in the above Certificate(s) of Title and if an easement is described above such is granted or created.

Dated this 7th **day of** January 1999.

Attestation

Signed for Transpower New Zealand Limited by its attorney Allan Jardine Burdett

Signature, or common seal of Transferor

Signed in my presence by the Transferor
Signature of Witness

Witness to complete in BLOCK letters
(unless typewritten or legibly stamped)
Witness name Nigel Dickson Barbour
Occupation SOLICITOR
Address WELLINGTON

Certified correct for the purposes of the Land Transfer Act 1952
Certified that no conveyance duty is payable by virtue of Section 24(1) of the Stamp and Cheque Duties Act 1971.
(DELETE INAPPLICABLE CERTIFICATE)

REF: 4135 /2

Solicitor for the Transferee

Registrar-General of Land Approval 95/1004EF A.D.L.S.

Approved by Registrar-General of Land under No. 1995/5003EF

Annexure Schedule

Registrar-General of Land Approval 95/5003EF A.D.L.S.

Insert below
"Mortgage", "Transfer", "Lease" etc

Transfer	Dated 7th January 1999	Page 2 of 3 Pages

Continuation of estate or interest to be created

The Transferor HEREBY TRANSFERS AND GRANTS to the Transferee the easements specified in this Transfer in and under such parts of the land marked ~~"A"~~ "D" in DP ~~103712~~ 204791 "the Servient Tenement".

The rights and powers set out in the Seventh Schedule to the Land Transfer Act 1952 and the rights and powers set out in the Ninth Schedule to the Property Law Act 1952 are herein implied but subject to the proviso that the registered proprietor from time to time of the Servient Tenement shall not be liable to contribute towards the cost of the establishment, maintenance or repair of any right of way formed or to be formed on the Servient Tenement from time to time unless that registered proprietor or its servants, agents, workmen or tenants shall have caused damage to any such formed right of way.

The terms, covenants, conditions or restrictions set out below shall attach to the electricity, gas, liquid fuel and communications easements specified herein.

ELECTRICITY, GAS, LIQUID FUEL AND COMMUNICATIONS

(a) The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, his tenants, and any other person lawfully entitled so to do) from time to time and at all times to separately take, convey, and lead electrical current, gas, liquid fuel and/or communications in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the Servient Tenement over which the easements are granted or created, together with:

(b) The full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, his tenants, and any other person lawfully entitled to do so) for the purpose of the easements concerned:

(i) To use any cables and/or pipes already laid on the stipulated course or any cable or cables and/or pipe or pipes in replacement or in substitution for all or any of those cables and/or pipes;

(ii) Where no such cables and/or pipes exist, to lay place, and maintain, or to have laid, placed and maintained cables and/or pipes of a sufficient size and of suitable material for the purpose under the surface of the Servient Tenement over which the easements are granted or created;

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

DSH MJB

Approved by Registrar-General of Land under No. 1995/5003EF

Annexure Schedule

Registrar-General of Land Approval 95/5003EF A.D.L.S.

Insert below "Mortgage", "Transfer", "Lease" etc

Transfer	Dated 7th January 1999	Page 3 of 3 Pages

(iii) In order to construct or maintain the efficiency of any such cable and/or pipe, the full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement, his tenants, servants, agents and workmen, with any tools, implements, machinery, vehicles, or equipment, of whatsoever nature necessary for the purpose to enter upon the Servient Tenement over which the easement is granted or created and to remain there for any reasonable time for the purpose of laying, inspection, cleansing, repairing, maintaining and renewing the cables, pipes, or other appurtenances thereto, or any part thereof and of opening up the soil of Servient Tenement to such extent as may be necessary and reasonable in that regard, subject to the condition that as little disturbance as possible is caused to the surface of the land of the Servient Tenement and/or any day to day use thereof by persons lawfully entitled to do so, and that the surface of the land of the Servient Tenement is promptly restored as nearly as possible to its original condition and any other damage done by reason of the aforesaid operations is repaired.

The easements specified in this transfer shall be forever appurtenant to the land of the Transferee being Lot 2 on DP 204791 contained in Certificate of Title 133B/132 (North Auckland Registry).

EXECUTED by)
CONTACT ENERGY Limited)
by its attorneys

PAUL ANTHONY
Name of Attorney

Signature of Attorney

DAVID S. HILL
Name of Attorney

D S. HILL
Signature of Attorney

in the presence of:

Signature

Solicitor
Occupation

Wellington
Place of Abode

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

DSH

Continuation of "Attestation"

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

I, **ALLAN JARDINE BURDETT** of Wellington, Property Manager, hereby certify that:

1. By Deed dated 6 August 1998 Transpower New Zealand Limited at Wellington appointed me its attorney on the terms and subject to the conditions set out in the said Deed.

   Copies of that Deed are deposited in the Land Transfer Offices listed below under the number shown alongside each of those offices:

Auckland	D.304456.1	Nelson	379776.2
South Auckland	B.497940.1	Marlborough	199217.1
New Plymouth	453373.1	Westland	110459.1
Gisborne	G.186127.1	Canterbury	A365168.2
Hawkes Bay	675562.1	Otago	952826.1
Wellington	B.681815.2	Southland	259733.2

2. At the date hereof I have not received any notice or information of the revocation of that appointment.

SIGNED at Wellington this 7th day of January 1999

.....
ALLAN JARDINE BURDETT

Approved by Registrar-General
of Land under No. 1995/1004EF

TRANSFER

Land Transfer Act 1952

COPY

11.42

14 Sep 01 D640353.5

Law Firm Acting
Buddle Findlay **Solicitors** **Wellington**

12/3/21

Auckland District Law Society
REF: 4135 /4

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(except for "Law Firm Acting")

D640353.10TE

TRANSFER
Land Transfer Act 1952

Approval 95/1004EF Registrar-General of Land A.D.L.S.

If there is not enough space in any of the panels below, cross-reference to and use the approved Annexure Schedule: no other format will be received.

Land Registration District

NORTH AUCKLAND

Certificate of Title No.		All or Part?	Area and legal description -- *Insert only when part or Stratum, CT*
137B	367	All	

Transferor *Surnames must be underlined or in CAPITALS*

CONTACT ENERGY LIMITED

Transferee *Surnames must be underlined or in CAPITALS*

THE MANUKAU CITY COUNCIL at Manukau

Estate or Interest or Easement to be created: *Insert e.g. Fee simple; Leasehold in Lease No .....; Right of way etc.*

Easement in gross for 1000 years from the date of this Transfer for ...
(continued on Annexure Schedule)

Consideration

In satisfaction of the Transferee's conditions for a resource consent required under the Resource Management Act 1991

Operative Clause

For the above consideration (receipt of which is acknowledged) the TRANSFEROR TRANSFERS to the TRANSFEREE all the transferor's estate and interest described above in the land in the above Certificate(s) of Title and if an easement is described above such is granted or created.

Dated this 10th **day of** September **2001**

Attestation

See attached	~~Signed in my presence by the Transferor~~ ~~Signature of Witness~~ X **Witness to complete in BLOCK letters** *(unless typewritten or legibly stamped)* Witness name Occupation Address
Signature, or common seal of Transferor	

Certified correct for the purposes of the Land Transfer Act 1952
Certified that no conveyance duty is payable by virtue of Section 24(1) of the Stamp and Cheque Duties Act 1971.
(DELETE INAPPLICABLE CERTIFICATE)

REF: 4135 /2

Solicitor for the Transferee

6/5 2001

Annexure Schedule

TRANSFER Dated 10th September 2001 Page 1 of 2 Pages

Registrar-General of Land Approval 95/1004EF A.D.L.S.

Continuation of Estate or Interest or Easement to be created

A water supply right in terms of a right to convey water and a right of way as set out in paragraphs 1, 2 and 5 of the Seventh Schedule of the Land Transfer Act 1952 over the Easement Area being those areas shown marked "H1", "H2", "V4", "H4", "V3" and "V1" on Deposited Plan 209362 as varied by the following covenants of the Transferor in favour of the Transferee:

1. That the Transferor shall not build, construct, erect or place any building or structure (including any fence or gate) nor deposit any fill on the Easement Area.

2. That, except for vehicular driveway and crossings to the extent necessary only for access to and exit from adjoining properties constructed of materials and to dimensions and specifications first approved for that purpose by the Transferee, the Transferor shall not pave, seal, or plant or grow any trees, shrubs or flowers within the Easement Area but shall at all times ensure that the Easement Area is grassed and maintained in a neat and tidy condition.

3. That the Transferor shall ensure that pipes and cables for electricity, gas and telephone laid underground through the Easement Area will be at a depth and location first approved by the Transferee.

4. That, for the purpose of restoration of the surface after performing works as provided in paragraph 5 of the Seventh Schedule of the Land Transfer Act 1952, the Transferee shall only be required to restore the surface soil and grass the same and restore approved vehicular driveway and crossings to the standard prior to any such works.

5. That paragraph 5 of the Seventh Schedule of the Land Transfer Act 1952 is varied by deleting the words in subparagraph (c) reading: "or where only the position of the pipeline is defined in the easement", and substituting for them the word "and".

6. The provisions of the Ninth Schedule of the Property Law Act 1952 shall not be implied in this grant of right of way.

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

REF: 4135 /3

Approved by Registrar-General of Land under No. 1995/5003EF

Annexure Schedule

Registrar-General of Land Approval 95/5003EF A.D.L.S.

Insert below "Mortgage", "Transfer", "Lease" etc

Transfer	Dated	10th September 2001	Page	2	of	2	Pages

Continuation of Attestation.../

SIGNED for and on behalf of)
CONTACT ENERGY LIMITED)
by its attorneys)

David S. Hill — D. S. Hill.

Name of attorney — Signature of attorney

DAVID JOHN PAY — [signature]

Name of attorney — Signature of attorney

in the presence of:

[signature]

Witness Signature

Wellington

Address

Environment + Property manager

Occupation

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

[signature]

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

We, **DAVID SNELLING HILL** General Manager-Generation, and

DAVID JOHN PAY Legal Counsel both of Wellington, certify:

1. **THAT** by Deed, dated 25 October 2000, Contact Energy Limited appointed us as its attorneys on the terms and conditions set out in that Deed.

2. **THAT** a copy of that Deed is registered at the various District Land Registries as follows:

North Auckland	D 558067.1
South Auckland	B 634746.1
Gisborne	231809.1
Hawkes Bay	709503.1
Taranaki	475091.1
Wellington	B 808436.1
Marlborough	215109.1
Nelson	402463.1
Westland	115370.1
Canterbury	A 481549.1
Otago	5012103.1
Southland	5012426.1

3. **THAT** at the date hereof we have not received any notice or information of the revocation of that appointment by Contact Energy Limited.

SIGNED at Wellington on the 10th day of September 2001

D S. Hill.

DAVID SNELLING HILL

DAVID JOHN PAY

Approved by Registrar-General
of Land under No. 1995/1004EF

TRANSFER

Land Transfer Act 1952

Law Firm Acting
BROOKFIELDS **LAWYERS** **AUCKLAND & MANUKAU**

Auckland District Law Society
REF: 4135 /4

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(except for "Law Firm Acting")

LINZ COPY

11.42 14.SEP01 D 640353

PATRICULARS ENTERED IN REGISTER
LAND REGISTRY NORTH [illegible]

D640353.11 EC

Registrar-General of Land Approval 98/6031EF A.D.L.S.

EASEMENT CERTIFICATE

(IMPORTANT: Registration of this certificate does not of itself create any of the easements specified herein).

I/We **CONTACT ENERGY LIMITED at Wellington**

being the registered proprietor(s) of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at **NORTH AUCKLAND**
on the day of under No. **DP 209362**
are the easements which it is intended shall be created by the operation of section 90A of the Land Transfer Act 1952.

SCHEDULE

DEPOSITED PLAN NO. **DP 209362**

Nature of Easement (e.g., Right of Way, etc.)	Servient Tenement		Dominant Tenement Lot No.(s) or other Legal Description	Title Reference
	Lot No.(s) or other Legal Description	Colour, or Other Means of Identification, of Part Subject to Easement		
• Right of Way, water supply, sewerage and stormwater drainage, gas and electricity supply, and telecommunications and liquid fuel supply	Lot 2	H1, H2, H3, H4 and V4	Lot 1	
• Stormwater drainage	Lot 2	L, V1, V3, V4, K, J4, U1, Y, N1, J6, N2, P1, J2, P2, P4, J1, Q	Lot 1	
• Stormwater drainage	Lot 1	R, S , J8, J10, P3, and P5	Lot 2	
• Telecommunications and electrical supply	Lot 2	W1, W3, W4 and W5	Lot 1	

REF: 4050 /1

21 DSM 2005

State whether any rights or powers set out here are in addition to or in substitution for those set out in the Seventh Schedule to the Land Transfer Act 1952.

1. Rights and powers:

The rights and powers set out in the Seventh Schedule to the Land Transfer Act 1952 and the rights and powers set out in the Ninth Schedule to the Property Law Act 1952 are herein implied but subject to the proviso that the registered proprietor from time to time of the Servient Tenement shall not be liable to contribute towards the cost of the establishment, maintenance or repair or any right of way formed or to be formed on the Servient Tenement from time to time unless that registered proprietor or its servants, agents, workmen or tenants shall have caused damage to any such formed right of way.

If at any time the Dominant Tenement comprises more than one lot, the owners thereof shall share the costs of maintenance and repair of the rights created herein on the Servient Tenement equally PROVIDED that should any maintenance or repairs be required as a consequence of the actions of one of such owners (and in the case of the Right of Way, the owner or the servient tenement) - whether directly or by their agents, servants or invitees, then such party shall be responsible for the cost of such repairs or maintenance.

Registrar-General of Land
Approval
98/8031EF
A.D.L.S.

2. Terms, conditions, covenants, or restrictions in respect of any of the above easements:

The terms, covenants, conditions or restrictions set out below shall attach to the electricity, gas, liquid fuel and communications easements specified herein.

ELECTRICITY, GAS, LIQUID FUEL AND COMMUNICATIONS

(a) The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, and his tenants, and any other person lawfully entitled to do so) from time to time and at all times to separately take, convey, and lead electrical current, gas, liquid fuel and/or communications in a free and unimpeded flow (except when the flow is halted for any reasonable period necessary for essential repairs) and in any quantity, consistent with the rights of other persons having the same or similar rights from the source of supply or point of entry, as the case may be, and following the stipulated course (where a course is stipulated) across the Servient Tenement over which the easements are granted or created, together with:

(b) The full, free, uninterrupted and unrestricted right, liberty, licence, and privilege for the registered proprietor of the Dominant Tenement and his tenants (in common with the registered proprietor of the Servient Tenement, his tenants, and any other person lawfully entitled to do so) for the purpose of the easements concerned:

(i) To use any cables and/or pipes already laid on the stipulated course or any cable or cables and/or pipe or pipes in replacement or in substitution for all or any of those cables and/or pipes;

(ii) Where no such cables and/or pipes exist, to lay, place, and maintain, cables and/or pipes of a sufficient size and of suitable material for the purpose under the surface of the Servient Tenement over which the easements are granted or created.

(iii) In order to construct or maintain the efficiency of any such cable and/or pipe, the full, free, uninterrupted and unrestricted right, liberty, licence and privilege for the registered proprietor of the Dominant Tenement, his tenants, servants, agents and workmen, with any tools, implements, machinery, vehicles, or equipment of whatsoever nature necessary for the purpose to enter upon the Servient Tenement over which the easement is granted or created and to remain there for any reasonable time for the purpose of laying, inspection, cleansing, repairing, maintaining and renewing the cables, pipes, or other appurtenances thereto, or any part thereof and of opening up the soil of the Servient Tenement to such extent as may be necessary and reasonable in that regard, subject to the condition that as little disturbance as possible is caused to the surface of the land of the Servient Tenement and/or any day to day use thereof by persons lawfully entitled to do so, and that the surface of the land of the Servient Tenement is promptly restored as nearly as possible to its original condition and any other damage done by reason of the aforesaid operations is repaired.

Dated this 10th day of September 2001

~~Signed by the above-named~~

SIGNED for and on behalf of)
CONTACT ENERGY LIMITED)
by its attorneys)

DAVID S HILL
Name of attorney

D.S. Hill
Signature of attorney

~~in the presence of~~

DAVID J PAY
Name of attorney

Signature of attorney

~~*Witness*~~ .....

~~*Occupation*~~ .....

~~*Address*~~ .....

in the presence of:

Witness signature

Wellington
Address

Environment + Property Manager
Occupation

Correct for the purposes of the Land Transfer Act 1952

(Solicitor for) the registered proprietor:

REF: 4050 /3

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

We, **DAVID SNELLING HILL** General Manager-Generation, and

DAVID JOHN PAY Legal Counsel both of Wellington, certify:

1. **THAT** by Deed, dated 25 October 2000, Contact Energy Limited appointed us as its attorneys on the terms and conditions set out in that Deed.

2. **THAT** a copy of that Deed is registered at the various District Land Registries as follows:

North Auckland	D 558067.1
South Auckland	B 634746.1
Gisborne	231809.1
Hawkes Bay	709503.1
Taranaki	475091.1
Wellington	B 808436.1
Marlborough	215109.1
Nelson	402463.1
Westland	115370.1
Canterbury	A 481549.1
Otago	5012103.1
Southland	5012426.1

3. **THAT** at the date hereof we have not received any notice or information of the revocation of that appointment by Contact Energy Limited.

SIGNED at Wellington on the 10th day of September 2001

D. S. Hill.

DAVID SNELLING HILL

DAVID JOHN PAY

Approved by Registrar-General
of Land under No. 1998/6031EF

EASEMENT CERTIFICATE

Land Transfer Act 1952

Law Firm Acting
Buddle Findlay **Solicitors** **Auckland**

Auckland District Law Society
REF: 4050 /4

This page is for Land Registry Office use only.
(except for "Law Firm Acting")

LINZ COPY

11.42 14.SEP01 D 640353

PATRICULARS ENTERED IN REGISTER
LAND REGISTRY NORTH

213

E 5271467.1 GRANT OF EASEMENT WI
CPV-01/01.PGS-012.03/07/02.10:59

DocID: 310453517

TRANSFER

Land Transfer Act 1952

If there is not enough space in any of the panels below, cross-reference to and use the approved Annexure Schedule: no other format will be received.

Land Registration District

North Auckland

Certificate of Title No.	All or Part?	Area and legal description — *Insert only when part or Stratum, CT*
137B/366 137B/367	All All	

Transferor *Surnames must be underlined*

CONTACT ENERGY LIMITED

Transferee *Surnames must be underlined*

TRANSPOWER NEW ZEALAND LIMITED

Estate or Interest or Easement to be created: *Insert e.g. Fee simple; Leasehold in Lease No. .....; Right of way etc.*

Electricity easements in gross (continued on pages 2 – 8 annexure schedules

Consideration

$1.00

Operative Clause

For the above consideration (receipt of which is acknowledged) the TRANSFEROR TRANSFERS to the TRANSFEREE all the transferor's estate and interest described above in the land in the above Certificate(s) of Title and if an easement is described above such is granted or created.

Dated this 11th **day of** June 2002

Attestation

D.S. Nicholl

Signature, or common seal of Transferor

Signed in my presence by the Transferor
Signature of Witness

Witness to complete in BLOCK letters
(unless typewritten or legibly stamped)

Witness name HIKITIA SHARLAND

Occupation PA

Address WELLINGTON

Certified correct for the purposes of the Land Transfer Act 1952

Nigel Barbour
Solicitor
Wellington

Solicitor for the Transferee

REF: 4135

Approved by Registrar-General
of Land under No. 1995/1004

TRANSFER

Land Transfer Act 1952

Law Firm Acting

Auckland District Law Society
REF: 4135

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(except for "Law Firm Acting")

LT 107

NOTICE OF PRODUCTION OF INSTRUMENTS

For office use only
Date
Number

LAND INFORMATION NZ
NORTH AUCKLAND

Messrs

The following are produced (Firm intending to register)

List of Instruments Produced by Number or C.T. Reference

CERTIFICATES OF TITLE 137B/366 & 137B/367

To enable registration of:

1. A easement from Contact to Transpower
2. A _____ from _____ to _____
3. A _____ from _____ to _____
4. A _____ from _____ to _____

After Registration Instruments Listed Above To Be Returned To:

MID-TOWN AGENCY SERVICES LIMITED
PO BOX 2694, WELLINGTON
(S BAAS - CON474899)

Received Above Instruments
For LINZ / /

CHAUCER PRESS 36009/5.0

This copy to be given to firm intending to register. Registration authorised above will not be accepted without production of this notice.

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

We, **DAVID SNELLING HILL** General Manager-Generation, and

DAVID JOHN PAY Legal Counsel both of Wellington, certify:

1. **THAT** by Deed, dated 25 October 2000, Contact Energy Limited appointed us as its attorneys on the terms and conditions set out in that Deed.

2. **THAT** a copy of that Deed is registered at the various District Land Registries as follows:

North Auckland	D 558067.1
South Auckland	B 634746.1
Gisborne	231809.1
Hawkes Bay	709503.1
Taranaki	475091.1
Wellington	B 808436.1
Marlborough	215109.1
Nelson	402463.1
Westland	115370.1
Canterbury	A 481549.1
Otago	5012103.1
Southland	5012426.1

3. **THAT** at the date hereof we have not received any notice or information of the revocation of that appointment by Contact Energy Limited.

SIGNED at Wellington on the 13th day of May 2002

D. S. Hill

DAVID SNELLING HILL

DAVID JOHN PAY

Continuation of "Estate or Interest or Easement to be created"

WHEREAS

A. The Transferor is the registered proprietor of the land in CsT 137B/366 and 137B/367 hereinafter referred to as the "**Land**".

B. The Transferee has constructed a deviation to an existing Transmission Line and a new substation on the Land and the Transferor has agreed to grant to the Transferee an Easement in Gross over that part of the Land which is more particularly described in this Transfer.

C. The parties have agreed to certain matters as set out below.

THIS TRANSFER WITNESSES THAT:

In consideration of the premises the Transferee shall have as an easement in gross in perpetuity the right to convey electricity over that part of the land in CT 137B/366 marked "**A**" on Deposited Plan **211681** and over that part of the land in CT 137B/367 marked "**B**" and "**D**" on Deposited Plan **211681** ("the **Deviation Easement Land**") and over that part of the land in CT 137B/367 marked "**C**" and "**D**" on Deposited Plan **211681** ("the **Substation Site**"), the Deviation Easement Land and the Substation Site together in this Transfer referred to as the "**Easement Land**", together with and subject to the covenants, rights and powers set out in the First Schedule and together with and subject to the following incidental rights and powers.

a. The right to maintain and operate the Substation and the Transferee's Equipment in the Substation on the Substation Site.

b. The right to maintain and operate the Deviated Transmission Line on the Deviated Easement Land.

c. The right to transmit and convey electricity, all associated signals, waves and impulses along, over and through the Deviated Transmission Line.

d. The rights of ingress and egress along with any vehicles, machinery or equipment over and through the Land and the right to remain on the Land for any purposes necessary or expedient for the exercise by the Transferee of the rights and interests granted in this Transfer (Grant of Easement) subject to the terms of this Transfer (Grant of Easement).

continued on page 3 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Continuation of "Estate or Interest or Easement to be created"

e. The right, subject to the terms of this Transfer, to maintain and operate any structures or fixtures on, above or below the Easement Land which the Transferee reasonably considers necessary or expedient for the support, operation or protection of the Deviated Transmission Line or the Substation or to assist in the efficient and proper use of the Deviated Transmission Line or the Substation.

f. The right to keep the Easement Land clear of any vegetation which is, or is likely, to be a danger or hazard to the safety or operation of the Substation or the Deviated Transmission Line.

AND the Transferor and Transferee covenant between themselves (with intent to bind themselves and their respective executors, administrators, successors and assignors) as set out in the First Schedule.

FIRST SCHEDULE of Easement
"Terms and Conditions"

1. Definitions

In this Transfer (Grant of Easement) unless the context requires otherwise -

"**Convey**" includes sending, passing, receiving, conducting, transmitting and transporting.

"**Deviation Easement Land**" means the area shown marked "**A**", "**B**" and "**D**" on Deposited Plan **211681**.

"**Deviated Transmission Line**" includes all or any part, of any cables, (including fibre optic cables for the purposes of operating the Transferee's electricity transmission grid and associated facilities), wires, earth wires, conductors or other apparatus, associated, used or intended to be used for the transmission of electricity and all associated signals, waves or impulses and includes towers, foundations, structures, equipment and fixtures, which the Transferee considers necessary or expedient for the support or protection of the Deviated Transmission Line and to assist in the efficient and proper use of the Deviated Transmission Line, and includes the fibre optic link from the Substation Site to the Transferee's main substation.

"**Easement Land**" means the area shown marked "**A**", "**B**" "**C**" and "**D**" on Deposited Plan **211681** and includes the Deviation Easement Land and the Substation Site.

"**Equipment**" includes transformers and other equipment, tools, machinery, cables, lines, fixtures, wires and all materials and items required for the purposes of exercising any of the rights given by this Transfer (Grant of Easement).

continued on page 4 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Annexure Schedule

Insert below
"Mortgage", "Transfer", "Lease" etc

Transfer | Dated 11. 6. 2002 | Page 4 of 9 Pages

Continuation of "Estate or Interest or Easement to be created"

"**Fixtures**" includes ground stays, supports, insulators, casings, devices, apparatus, appliances, antennas, conductors, poles and all associated appurtenances and also points, aerial crossing bridges, bridge abutments and metering devices.

"**Machinery**" includes cranes, drilling rigs, plant, pile drivers, excavators and other similar tools and machinery.

"**Maintain**" includes maintain, repair, renew, alter, upgrade, inspect and improve and "**maintenance**" has a similar meaning.

"**Operate**" includes to send, pass, receive, conduct, transmit and transport electricity, and all associated signals, waves or impulses, and "**operation**" has a similar meaning.

"**Power Station**" means the Otahuhu B Combined Cycle Power Station.

"**Road**" include road, track and accessway.

"**Signals**" include signals, waves, impulses and light waves.

"**Soil**" includes soil, gravel or other similar substances.

"**Structures**" includes buildings, towers, structures, repeaters, pipes, cables, bridges, roads, walls, frames and fences of any kind.

"**Substation**" includes any buildings, structures or enclosures, equipment or fixtures installed and constructed by the Transferee on the Substation Site and used or associated with the control of the transmission, transformation or distribution of electricity and/or telecommunications.

"**Substation Site**" means the area shown marked "**C**" and "**D**" on Deposited Plan **211681**.

"**Transferee**" includes the Transferee's engineers, surveyors, workmen, agents, employees, servants, contractors, lessees, licensees or invitees with or without any vehicles machinery or equipment.

"**Vegetation**" includes all vegetation both cultivated and natural and includes grass, crops, trees and shrubs and includes any vegetation encroaching into the airspace of the Easement Land.

"**Vehicles**" include trucks, tractors, cars, bicycles, motorcycles (2 and 4 wheeled), aircraft, trailers, graders, excavation and earthmoving equipment, whether wheeled or tracked.

continued on page 5 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Annexure Schedule

Insert below
"Mortgage", "Transfer", "Lease" etc

Transfer | Dated 11. 6. 2002 | Page 5 of 9 Pages

Continuation of "Estate or Interest or Easement to be created"

2. The parties acknowledge that each has electrical Equipment and Fixtures in the Substation. Each party shall have the right to install, maintain and operate Equipment and Fixtures on the Substation Site which are reasonably necessary for the operation of the Substation and/or the Power Station. Neither party will carry out or permit any works to be carried out on the Substation Site which may interfere with the operation of electrical Equipment or Fixtures of the other party unless the party has first liaised with the other party and obtained the prior written consent of that party, but such consent shall not be unreasonably withheld.

3. Each party shall maintain its Equipment and Fixtures on the Easement Land in good order and repair.

4. The Transferee shall carry out all works permitted by this Transfer (Grant of Easement) as expeditiously and with as little disturbance to the Easement Land and the Land as possible. Immediately upon the completion of any work the Easement Land and the Land shall be reinstated as nearly as possible to its original condition by the Transferee.

5. The Transferee will promptly reinstate any underground pipes, cables or other service conduits of the Transferor or any third party having the right to lay, use or maintain them on any part of the Land, which are damaged by the carrying on by the Transferee of any work.

6. The Deviated Transmission Line and the Transferee's Equipment and Fixtures shall remain the property of the Transferee.

7. The Transferor shall have the right to use the Easement Land subject to the provisions of clause 2 and the succeeding provisions of this clause. The Transferor shall not do anything whereby the rights, powers, licenses and liberties granted to the Transferee may be materially interfered with or affected in any way. In particular the Transferor shall at all times comply with the relevant provisions of the New Zealand Electrical Code of Practice for Electrical Safety Distances, NZECP34:1993.

8. If the Transferor consents to or causes or permits any breach of the obligations set out in clause 7, the Transferee shall be entitled to take all reasonable steps to abate or remedy the particular breach including, but not limited to, the trimming or renewal of vegetation, the removal or reduction of structures, fences or stockpiles and any other steps necessary for the protection of the Deviated Transmission Line or the Substation on the Easement Land and in the absence of negligence or recklessness, the Transferee shall not be liable to the Transferor, whether in contract, tort or otherwise, for any loss, compensation, damage or expenses incurred or suffered by the Transferor.

continued on page 6 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Continuation of "Estate or Interest or Easement to be created"

9. The Transferee when exercising any of the rights contained herein shall at all times comply with the Transferor's established safety, security, access and operating practices either in force at the date of this Transfer, or as subsequently promulgated by the Transferor from time to time on a reasonable basis. In particular, the Transferee will comply with such standard entry conditions and rules as the Transferor may reasonably apply from time to time to persons entering onto the Land.

10. The Transferee agrees to enter on and/or use the Easement Land and the Land at the Transferee's risk and releases to the full extent permitted by law the Transferor its servants and agents from all claims and demands of any kind and from all liability which may arise in respect of any accident, damage or injury occurring to any person or property in or about the Easement Land or the Land.

11. Each party shall be liable for making good and indemnifies the other party against any direct physical damage to any property of the other party or any third party occurring in the course of the exercise of rights hereunder that is a direct consequence of any negligence of the part on the first party or any persons under the control of the first party.

12. Whether or not caused by any breach or default by a party in the observance of the terms of this Agreement or otherwise, and whether or not the relevant party was or should have been aware that such loss, damage or expense might result from a breach or default by that party, a party shall not be liable whether in contract, tort (including negligence) or otherwise for:

(a) any direct, indirect consequential or other loss or damage (other than direct physical damage as provided for in clause 11) or for the loss of business profits, actual or anticipated;

(b) any expenses incurred by the other party which have been rendered futile; or

(c) for any loss, damage or expense caused by or resulting from circumstances beyond the control of the first party.

13. Without prejudice to its liability under clause 11, each party shall effect a policy of Public Risk Insurance against liability for loss, damage or injury arising out of the exercise of its rights hereunder, for the sum of $10,000,000.00 arising out of any one single accident or event.

14. The parties acknowledge that the rights hereby granted in respect of the Substation are intended to operate only for so long as the Transferor is supplying electricity from the Power Station to the national grid. The Transferee shall surrender its rights under this Transfer (Grant of Easement) in respect of the Substation if the Transferor ceases to supply electricity from the Power Station to the national grid with the intention that that supply shall cease permanently.

continued on page 7 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Insert below "Mortgage", "Transfer", "Lease" etc

Transfer | Dated 11. 6. 2002 | Page 7 of 9 Pages

Continuation of "Estate or Interest or Easement to be created"

15. On the surrender or other termination of rights in respect of the Substation:

(a) the Transferee shall be entitled to remove and will, if required by the Transferor, the Transferee" Equipment and Fixtures located on the Substation Site;

(b) all structures, fixtures or equipment left on the Substation Site, excluding the Deviated Transmission Line, shall, at the option of the Transferor become the property of the Transferor without payment of compensation;

(c) the Transferee shall, upon request of the Transferor, execute a registrable partial surrender of this Transfer in respect of the Substation and its use.

16. Either party may transfer, lease, assign or licence all or any part of its estate or interest in the Easement Land and/or the rights in this Transfer or any parts of those rights without the consent of the other party, but

(a) subject to the rights and obligations set out in this Transfer; and

(b) no transfer, lease, licence or assignment of any part less than the whole of that party's estate or interest in the Easement Land and/or the rights in this Transfer or lease or licence of all or part of that party's estate or interest in the Easement Land and/or the rights in this Transfer shall operate so as to relieve that party from compliance with and performance of all obligations imposed on that party under this Transfer without the prior written consent of the other party.

17. Notwithstanding the provisos to clause 16, the parties agree that with effect from the registration of a transfer of the whole of a party's estate or interest in the Easement Land or the Land and the rights in this Transfer, that party shall be released from all obligations under this Transfer and all actions, claims or proceedings which the other party may have against that party under or in respect of anything done or not done after that date of registration of the Transfer to the intent that the rights and obligations in this Transfer shall be enforceable by and against only the registered proprietors for the time being of the said estates and interests.

18. The Transferee will consider in good faith any request by the Transferor to relocate the Substation or the Deviated Transmission Line where reasonably necessary having regard to the Transferor's current or future business operations from the Land, but nothing in this clause shall oblige the Transferee to agree to such a request.

continued on page 8 annexure schedule

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Annexure Schedule

Insert below "Mortgage", "Transfer", "Lease" etc

Transfer | Dated 11. 6. 2002 | Page 8 of 9 Pages

Continuation of "Estate or Interest or Easement to be created"

19. In this Transfer (Grant of Easement):-

(a) references to clauses and schedules are references to clauses in and schedules attached to this Transfer;

(b) references to the singular shall include the plural and vice versa;

(c) references to one gender shall include the other genders:

(d) references to the parties shall include their respective executors administrators, successors and assigns.

Continuation of "Attestation"

Signed by the Transferee
TRANSPOWER NEW ZEALAND LIMITED by its Attorney
ALLAN GEOFFREY BRADSHAW
in the presence of:

Julie Frances Broadbridge
Property Administrator
Transpower New Zealand Ltd.
WELLINGTON

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Approved by Registrar-General of Land under No. 1995/5003

Annexure Schedule

Insert below
"Mortgage", "Transfer", "Lease" etc

Transfer | Dated 11. 6. 2002 | Page 9 of 9 Pages

CERTIFICATE OF NON-REVOCATION OF POWER OF ATTORNEY

I, **ALLAN GEOFFREY BRADSHAW, Property Manager,** of Wellington, hereby certify as follows:

1 That by deed dated 19th July 2001, **TRANSPOWER NEW ZEALAND LIMITED,** a duly incorporated company having its registered office at Wellington ("the Company"), appointed, as its attorneys in New Zealand, the persons then and from time to time holding certain offices within the Company (such offices being specified in the said deed), on the terms and subject to the conditions set out in the said deed.

2 That the said deed was deposited in the Land Registry Offices at:

North Auckland	**D.627008.1**	Nelson	**5065370.1**
South Auckland	**B.671479.1**	Marlborough	**5065367.1**
Taranaki	**481172.1**	Westland	**5065349.1**
Gisborne	**234165.1**	Canterbury	**5065361.1**
Hawkes Bay	**718625.1**	Otago	**5065225.1**
Wellington	**5065471.1**	Southland	**5065233.1**

3 That I hold the above mentioned office which is specified in the said deed.

4 That, as the date hereof, I have not received any notice or information, actual or constructive, of the revocation of the said power of attorney either through the dissolution or winding up of **TRANSPOWER NEW ZEALAND LIMITED** or otherwise or of the cancellation or revocation of my appointment as attorney of the Company or otherwise.

SIGNED at Wellington this 11th day of June 2002

ALLAN GEOFFREY BRADSHAW

in the presence of:

Witness Signature

Occupation

City of Residence:

Julie Frances Broadbridge
Property Administrator
Transpower New Zealand Ltd.
WELLINGTON

If this Annexure Schedule is used as an expansion of an instrument, all signing parties and either their witnesses or their solicitors must put their signatures or initials here.

Compensation Certificate

Correct for the purposes of the Land Transfer Act 1952

.....

Solicitor for Manukau City Council

Pursuant to Section 19 of the Public Works Act 1981 pertaining to part Certificate of Title 137B/367 (North Auckland Registry) and part Certificate of Title 125B/883 (North Auckland Registry)

Contact Energy Limited
Owner

Manukau City Council
Local Authority

phillips fox
PO Box 160
AUCKLAND
Telephone: (09) 303 2019
Facsimile: (09) 303 2311

Compensation Certificate

To: The District Land Registrar
North Auckland Registry

Pursuant to section 19 of the Public Works Act 1981 this Compensation Certificate is forwarded to you to be deposited in your Registry and a memorial registered against the certificates of title to all the land affected thereby.

1 Land

Firstly, that part of the parcel of land contained in certificate of title NA 137B/367, being approximately 38383m² as shown on the location drawing attached to the agreement.

Secondly, that part of the parcel of land contained in certificate of title NA 125B/883, being approximately 342m² as shown on the location drawing attached to the agreement.

2 Brief particulars of the agreement

2.1 **Date:** 11 October 2004

2.2 Manukau City Council to acquire the abovementioned land for road.

2.3 **Compensation:** As provided for in clause 5 of the Agreement for Sale of Land for Road and Compensation between Contact Energy Limited and the Manukau City Council.

3 Names of parties other than the Manukau City Council

Owner: Contact Energy Limited, being the registered proprietor of the above described land having its registered offices at Level 1, Harbour City Tower, 29 Brandon Street, Wellington.

4 Further particulars

4.1 Place where a copy of the Agreement may be inspected:

At the offices of Council's Administration Building, Level 9, Manukau City Centre

4.2 Hours during which the Agreement may be inspected: Between the hours of 8.30 a.m. and 4.30 p.m. on all days when the said Council's offices are open.

4.3 Reference by which the Agreement may be identified:

Waiouru/Contact

Date: 29 October 2004

Signed for and on behalf of the
Manukau City Council

Colin Dale
CITY MANAGER

Landonline User ID: LAWFACTORLAU

LODGING FIRM: LAW FACTOR LTD

Address: 2 / 11 / 04 (3)

Uplifting Box Number: 83

ASSOCIATED FIRM: PHILLIPS FOX - BC

Client Code / Ref: 0340179

HEREWITH

Survey Plan (#)

Title Plan (#)

Traverse Sheets (#)

Field Notes (#)

Calc Sheets (#)

Survey Report

Other (state)

Dealing / SRID Number (LINZ Use only)

Priority Purpose/Date Stamp (LINZ Use only)

CC 6202531.1 Compensa
Cpy – 04/04, Pgs – 004, 03/11/04, 06:55
Copies
(inc. original)
DocID: 311665702

Plan Number Pre-Allocated or to be Deposited

Rejected Dealing Number

Priority Order	CT Ref	Type of Instrument	Names of Parties	DOCUMENT OR SURVEY FEES	MULTI-TITLE FEES	NOTICES	ADVERTISING	NEW TITLES	OTHER	RE-SUBMISSION & PRIORITY FEE	FEES $ GST INCLUSIVE
1	137B/367, 125B/883	CC	MANUKAU CITY COUNCIL								
2											
3											
4											
5											
6											

Land Information New Zealand Lodgement Form

Annotations (LINZ Use only)

Fees Receipt and Tax Invoice

GST Registered Number 17-002-895

LINZ Form P005

LINZ Form P005 - PDF

Original Signatures? ____

Subtotal (for this page)	
Total for this dealing	$0.00
Less Fees paid on Dealing #	
Cash/Cheque enclosed for	**$0.00**

Version 1.7: 28 May 2004

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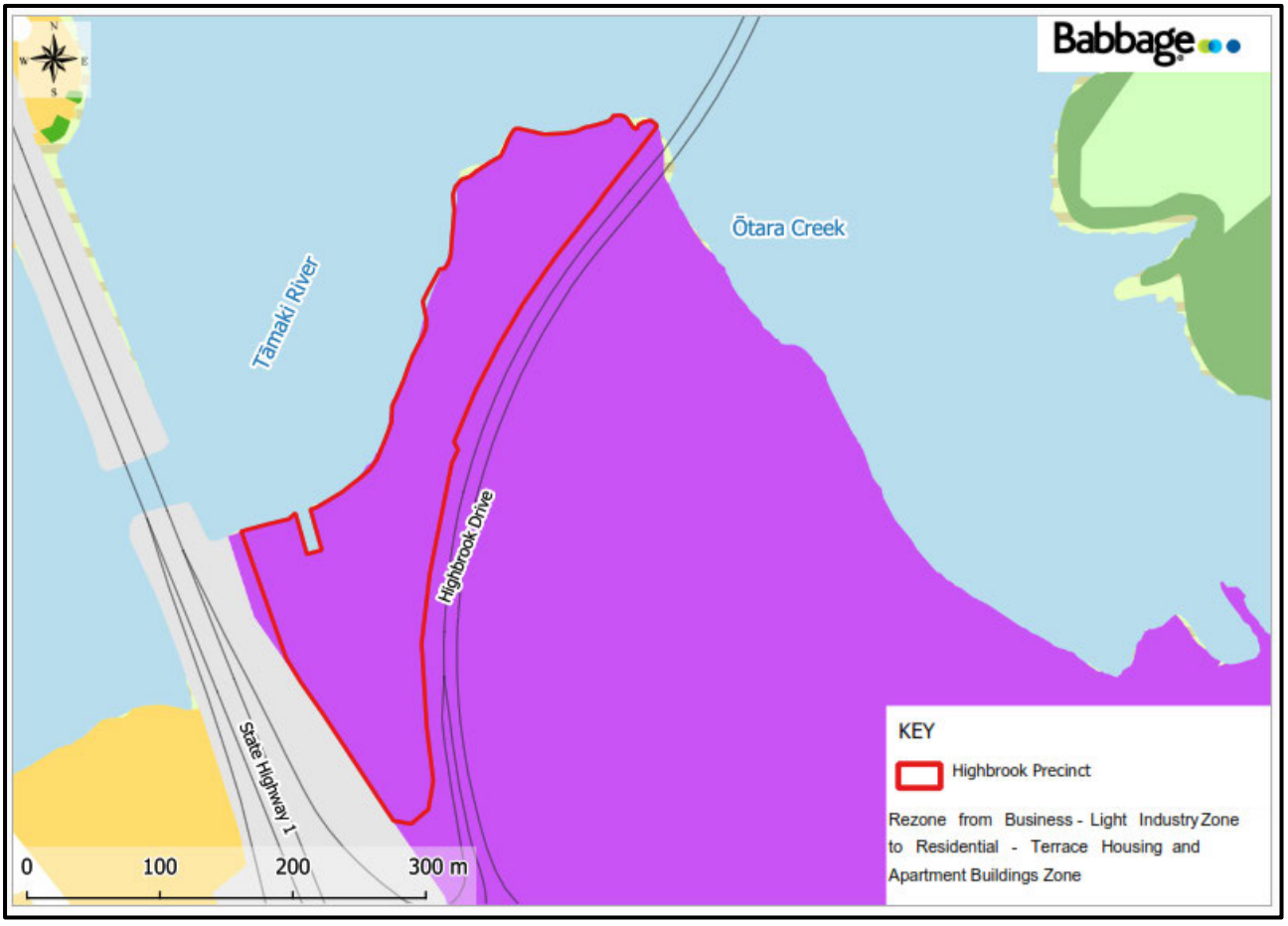
APPENDIX 2

PRIVATE PLAN CHANGE REQUEST AUGUST 2022

PRIVATE PLAN CHANGE REQUEST – PROPOSED CHANGES TO THE AUCKLAND UNITARY PLAN (OPERATIVE IN PART)

Amend the Auckland Unitary Plan (Operative in Part) as follows:

1) Rezone the Plan Change area as shown below:



2) Insert a new Highbrook Precinct into Chapter I Precincts (South) as set as out below:

I□□High□roo□ Precinct

I□1□Precinct Description

□□□□r□□□ □r□□□□□□□□□l□□□□□d □□□d□ □□□□ □□□□□r□□□ □□d□□r□□l □r□□□□□□□ □r□□□□□□□□ □□□□d□d □□ Tāmaki River, Ōtara Creek, Highbrook Drive and State Highway 1.

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[illegible]

I[illegible]1 Maximum number of dwellings

(1) [illegible] 200[illegible]

(2) [illegible]

Type	Equivalent dwellings unit value
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[illegible]	0[illegible]
[illegible]	1[illegible]

I[illegible] Highbrook Precinct Transportation Plan

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I[illegible]pgrading o[illegible]shared c[illegible]e [illegible]pedestrian path and pedestrian [illegible]arrier

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[illegible]

I[illegible]Road noise atten[illegible]ation

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[illegible]

Note:

Mechanical cooling must be provided for all habitable rooms (excluding bedrooms) provided that at least one mechanical cooling system must service every level of a dwelling that contains a habitable room (including bedrooms)

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[illegible] Assessment – contro[illegible]ed acti[illegible]ities

[illegible]

[illegible] Assessment – restricted discretionar[illegible] acti[illegible]ities

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[illegible]1 [illegible] – R[illegible]

[illegible] effects on people’s health and residential amenity

[illegible]

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I[illegible] Assessment criteria

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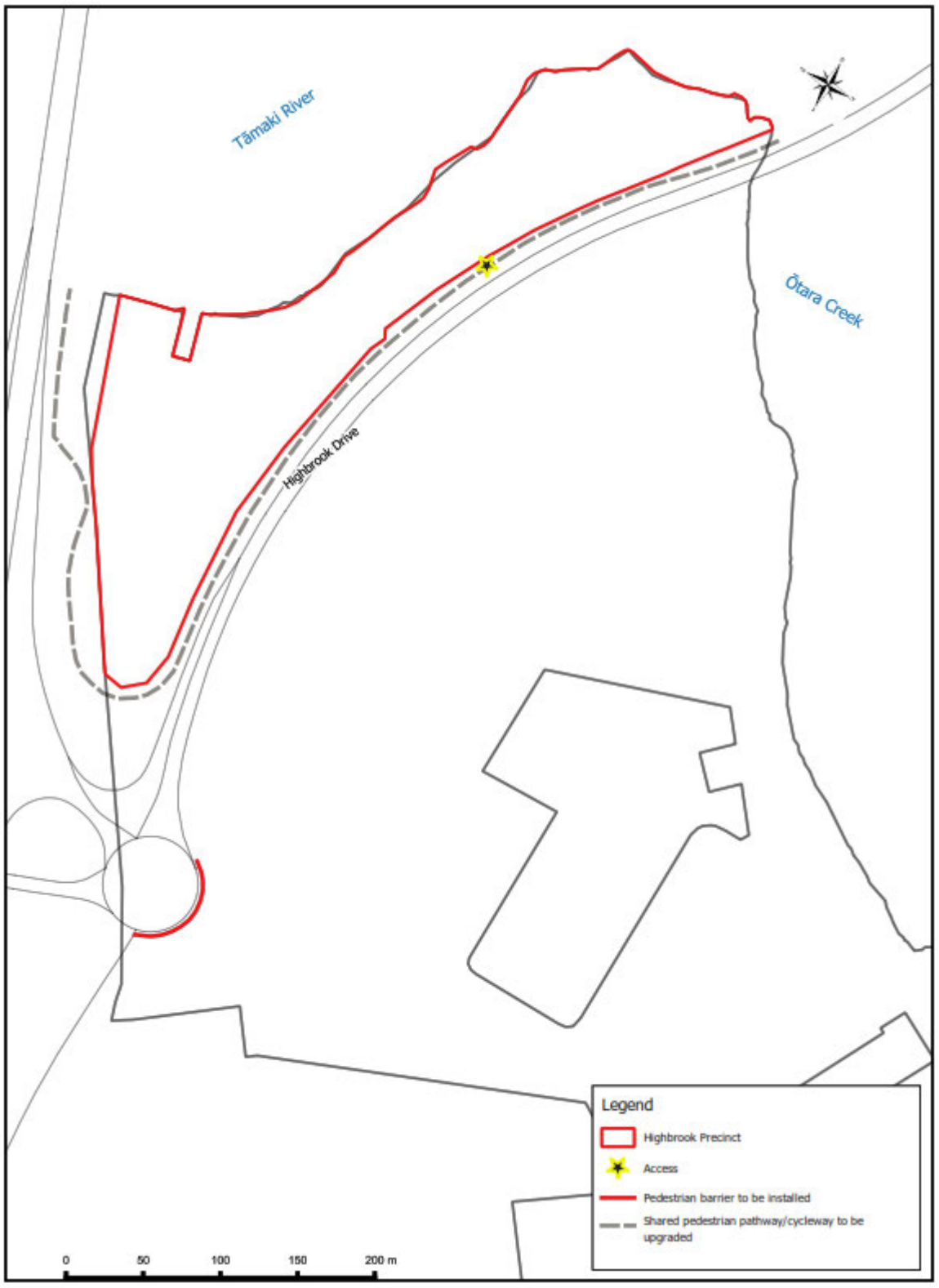
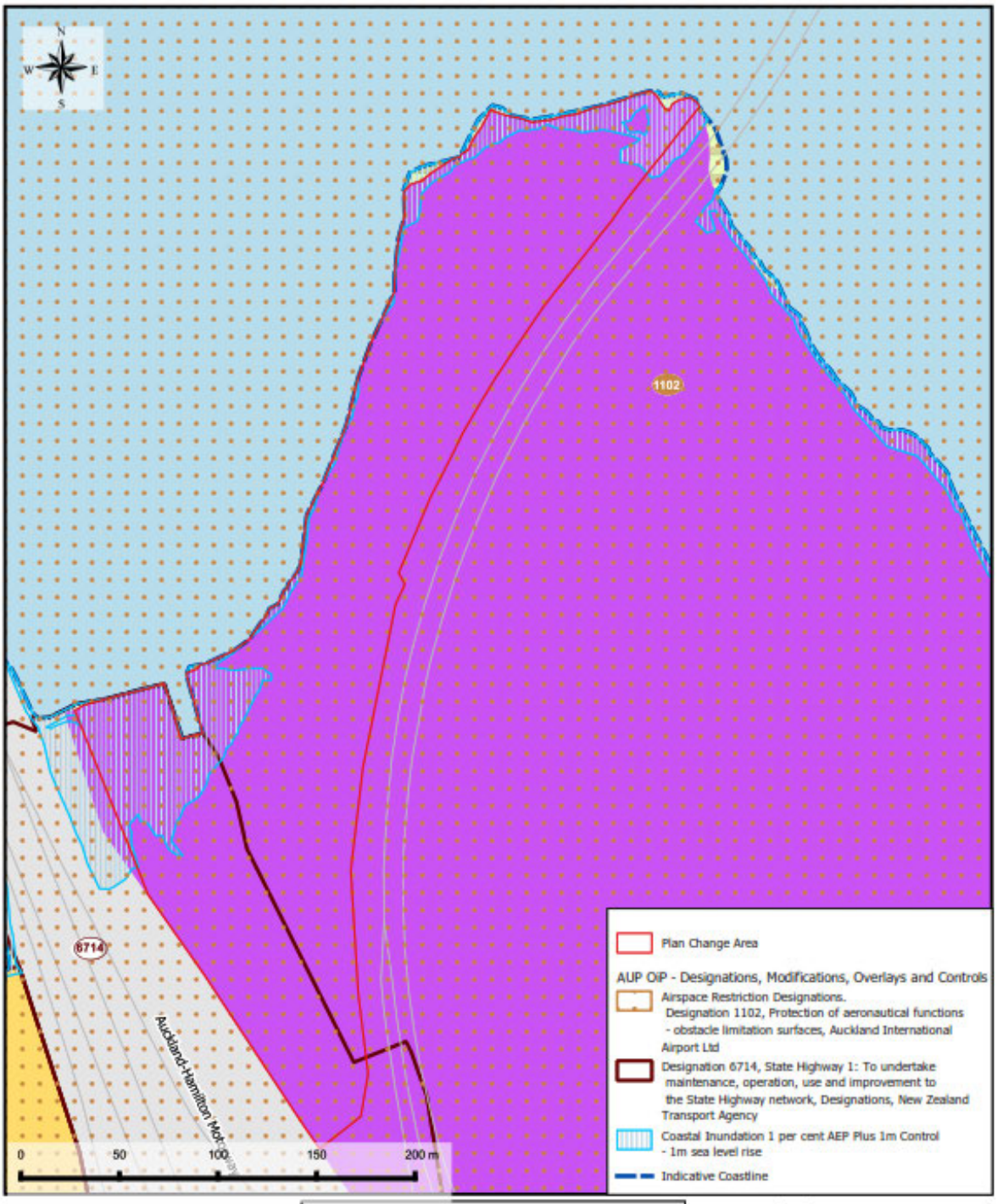


APPENDIX 3

AUP PROVISIONS APPLYING TO PC AREA AUGUST 2022

APPENDIX 3: Auckland Unitary Plan (Operative in Part) Planning Maps- Provisions Applying to the Plan Change Area.

Map 1



AUP OiP - Designations, Controls and Overlays

30/03/2022 Initial version by TT

SCALE @ A4 1:2,500

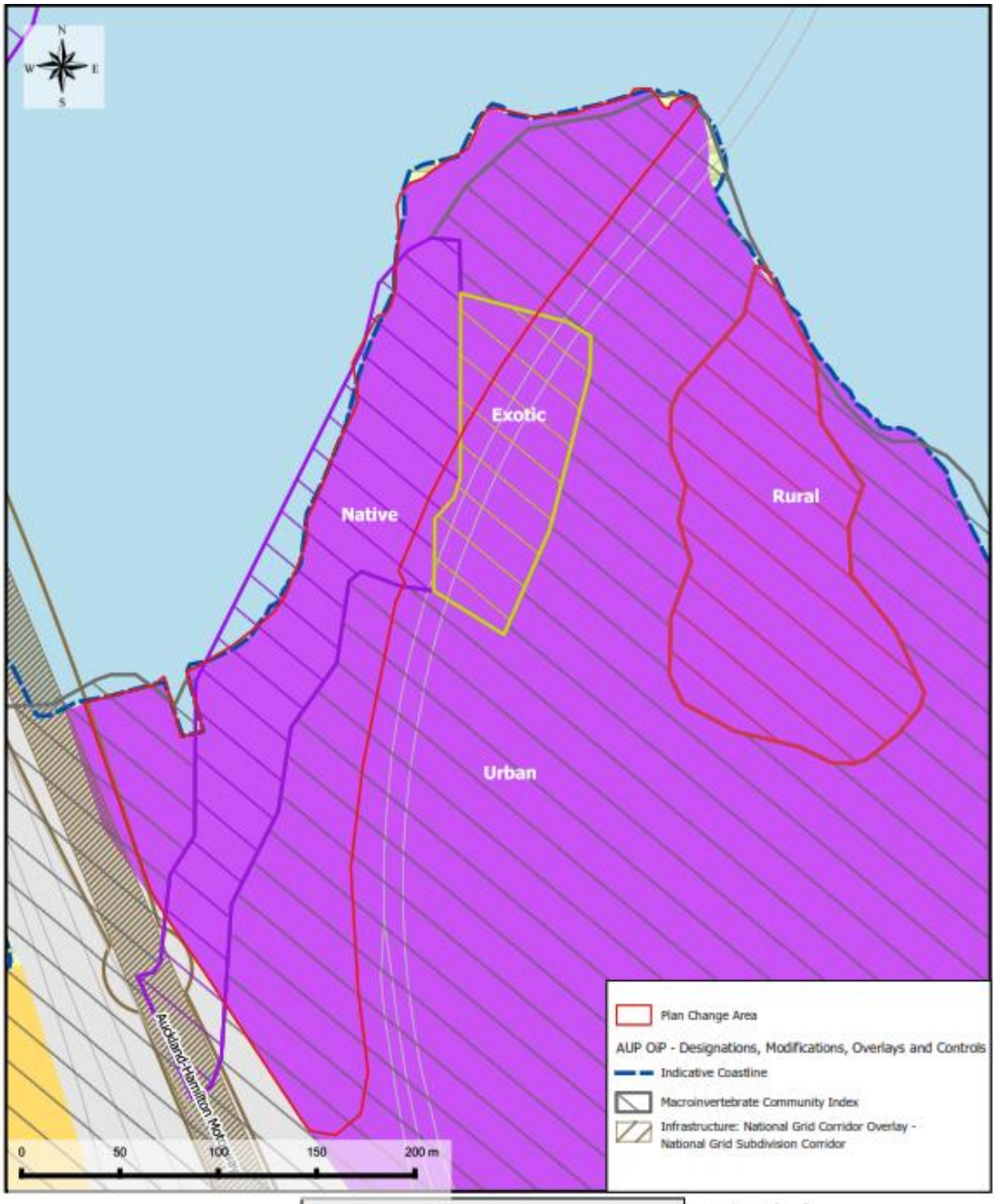
SOURCES
Roads: LINZ Data Services
Land Parcels: LINZ Map Services
Legal Zoning: Auckland Council

Legend
- Business - Light Industry Zone
- Coastal - Coastal Transition Zone
- Coastal - General Coastal Marine Zone
- Strategic Transport Corridor Zone

Babbage

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

Map 2



AUP OiP - Designations, Controls and Overlays

30/03/2022 Initial version by TT

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Legend

- Business - Light Industry Zone
- Coastal - Coastal Transition Zone
- Coastal - General Coastal Marine Zone
- Strategic Transport Corridor Zone

Babbage

APPENDIX 4

SPECIALIST REPORTS AND ASSESSMENTS

PROPERTY ECONOMICS

HIGHBROOK
PROPOSED PLAN CHANGE
ECONOMIC OVERVIEW

Client: Highbrook Living Limited

Project No: 52139

Date: November 2021

SCHEDULE

Code	Date	Information / Comments	Project Leader
52139.10	November 2021	Report	Phil Osborne

DISCLAIMER

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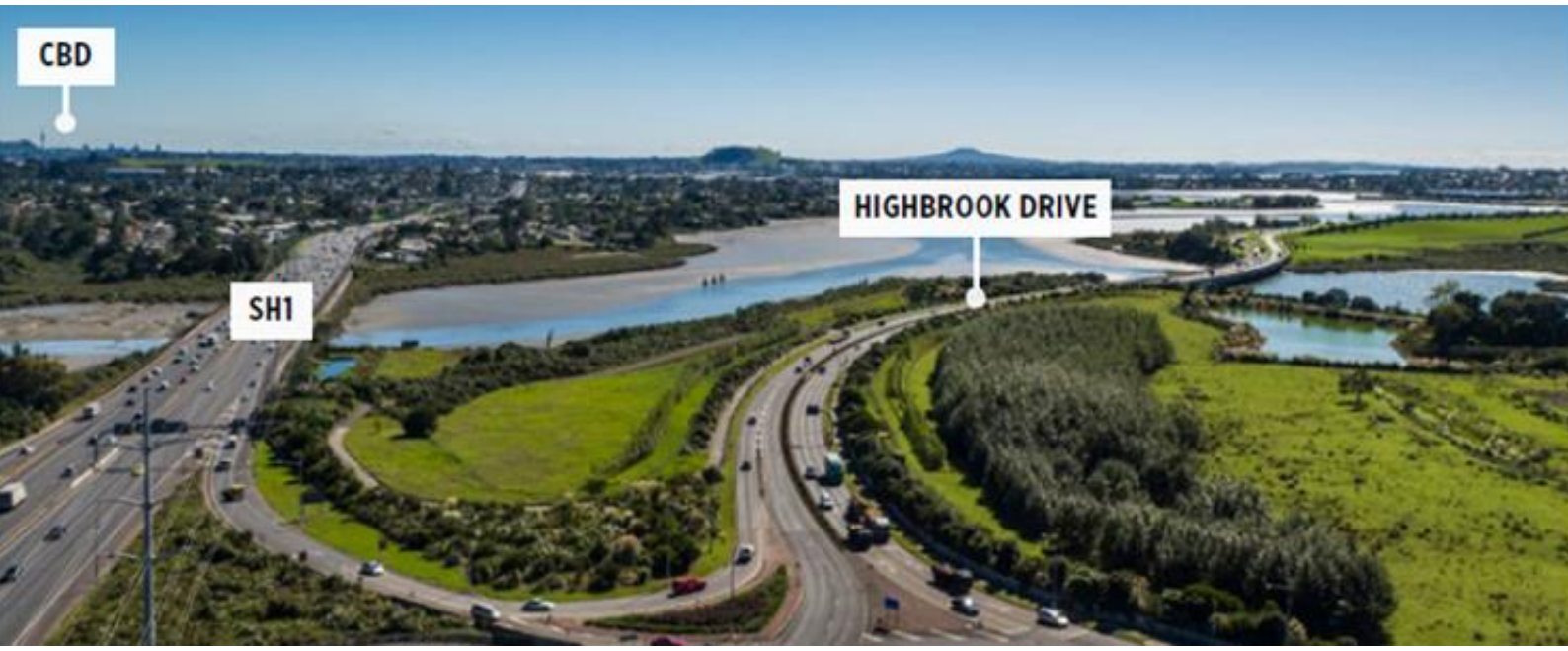


1. INTRODUCTION

Property Economics has been engaged by Highbrook Living Limited (**HLL**) to prepare an economic report assessing a Proposed Plan Change (**PPC**) request by HLL (**the Applicant**) to the Auckland Unitary Plan Operative in Part (**AUPOIP**). This PPC seeks to rezone approximately five hectares (5ha) of land on Highbrook Drive, Auckland, from Light Industrial Zone (LIZ) to Terrace Housing and Apartment Buildings Zone (or Mixed Housing Urban Zone).

This report is designed to review the industrial market in the context of the current zoned land provision, future industrial development, and projected market demand as outlined in the relevant Auckland Council reports. It also considers the economic efficiency of the PPC to accommodate the proposed high-density residential development at the proposed site.

The following section illustrates the sequential steps undertaken in the assessment adopted for this report to understand the methodology.

1.1. KEY RESEARCH OBJECTIVES

The core objectives of the report are to:

- Identify the core market for light industrial activities provided at the proposed site.
- Review and assess the industrial land provision for Auckland and the identified catchment.
- Breakdown Auckland region and the identified catchment industrial provision into occupied and vacant land.

- Review the industrial employment market for the catchment.
- Assess the potential 'uptake' of light industrial within the catchment.
- Review the sufficiency of the light industrial zone land within the catchment.
- Assess the viability of the proposed site for light industrial activity.

1.2. INFORMATION SOURCES

Information and data have been obtained from a variety of credible sources and publications available to Property Economics, including:

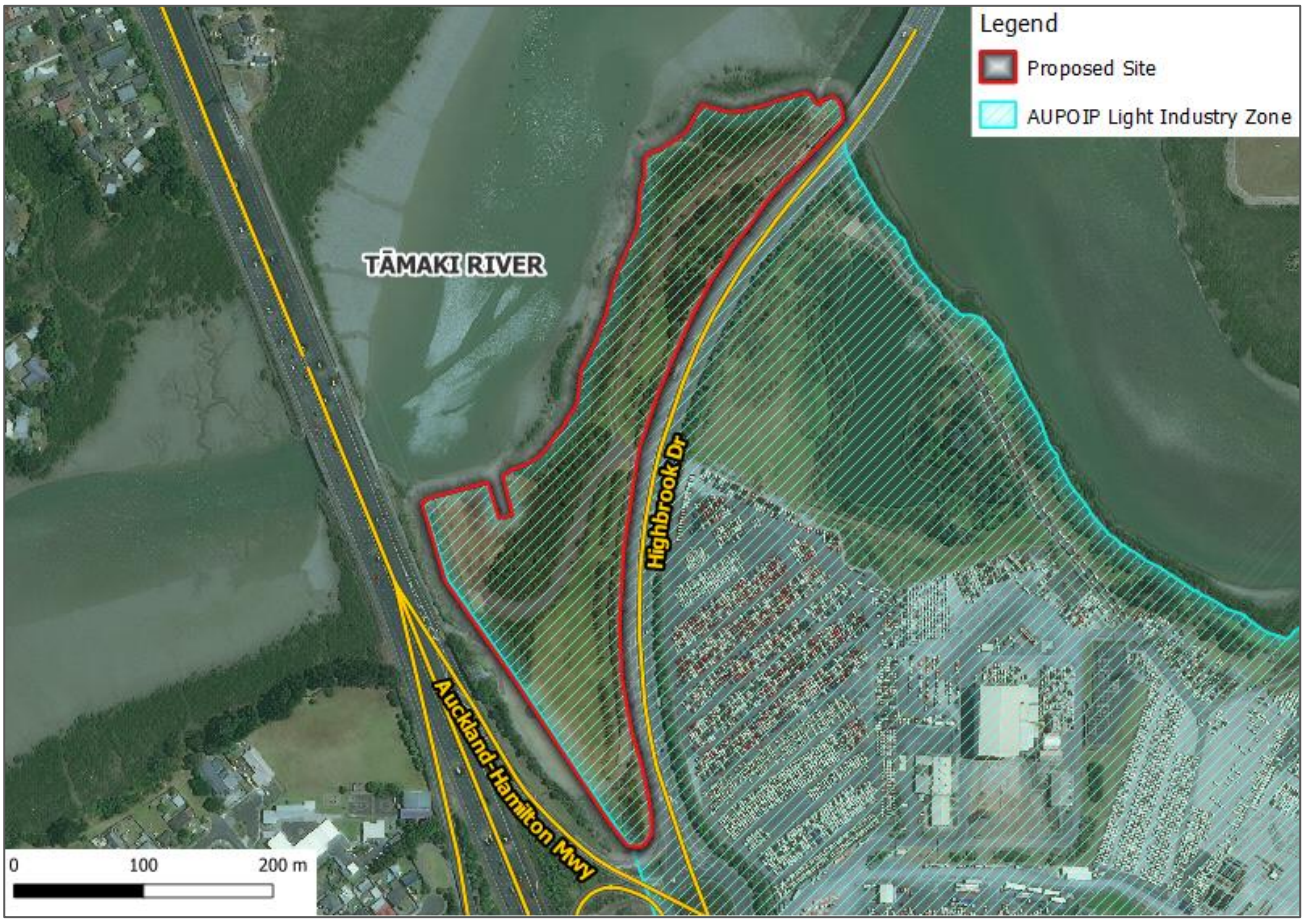
- Auckland Unitary Plan Operative in Part – Auckland Council
- Auckland Plan 2050 – Auckland Council
- Building Consent Statistics – Statistics New Zealand
- Business Demographic Statistics – Statistics New Zealand
- Drury Opaheke Structure Plan – Auckland Council
- Google Maps NZ
- Catchment Maps – Property Economics
- H17 Business- Light Industry Zone – Auckland Council
- Housing and Business Development Capacity Assessment 2017 – Auckland Council
- Pukekohe-Paerata Structure Plan 2019 – Auckland Council
- Silverdale West Dairy Flat Industrial Area Structure Plan 2020 – Auckland Council
- Warkworth Structure Plan - Auckland Council
- Whenuapai Structure Plan 2016 – Auckland Council

2. PROPOSED PLAN CHANGE

The PPC site spans approximately 5ha and is located in north Ōtara, Auckland. The site is bounded by Highbrook Drive to the south-east, State Highway 1 to the west, and Tāmaki River to the north. The proposed site forms part of the existing Light Industry zone (LIZ) under the AUPOIP and is currently vacant.

The PPC seeks to rezone this site from the existing LIZ to Terrace Housing and Apartment Building Zone (THAB) or Mixed Housing Urban Zone to enable efficient land use. The PPC site is illustrated in Figure 1 below.

FIGURE 1: LOCATION AND BOUNDARY OF THE PPC SITE



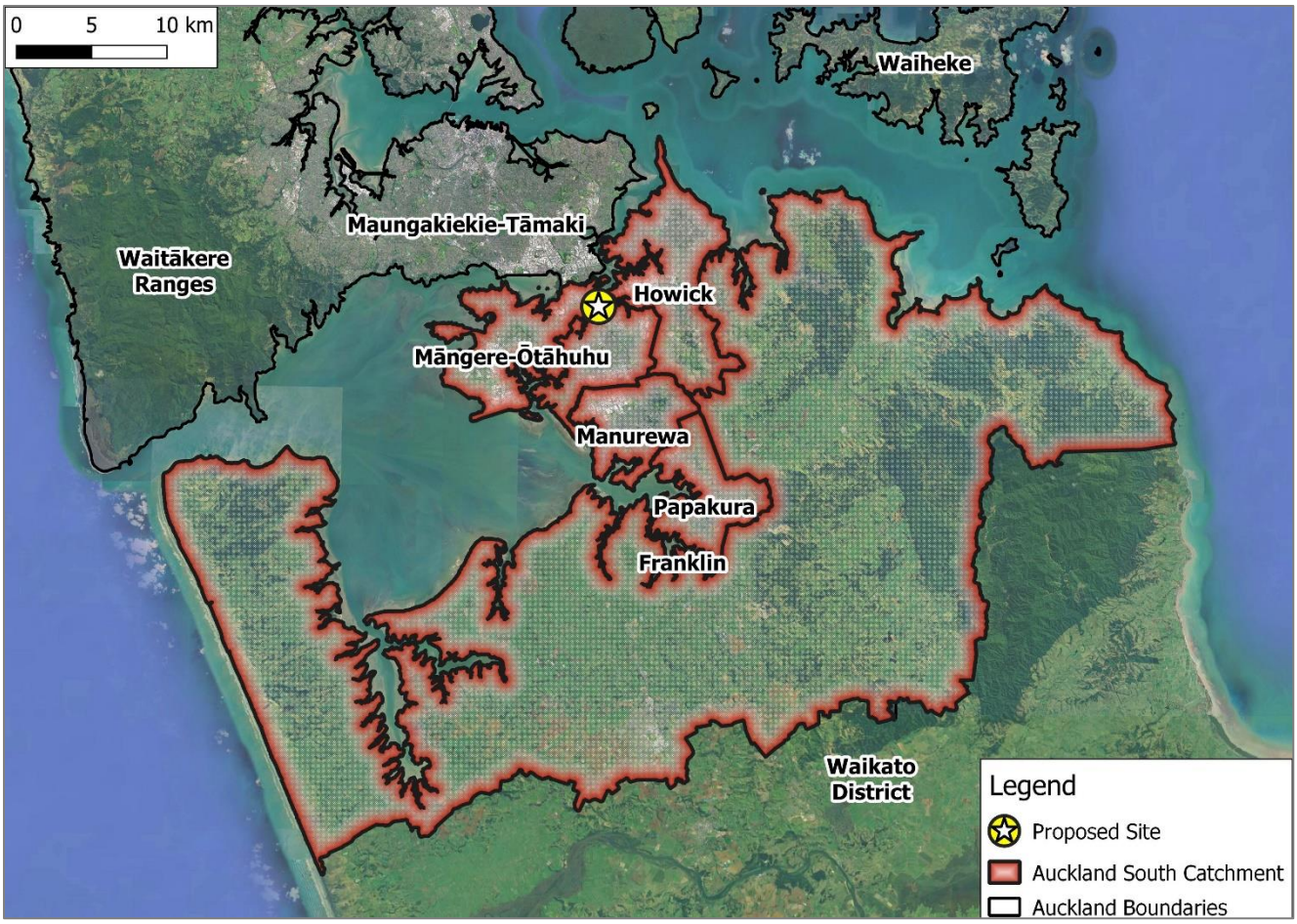
Source: Property Economics, Google Maps

3. IDENTIFIED INDUSTRIAL MARKET

Figure 2 highlights the core economic market considered most relevant to the PPC in terms of light industrial activity. This core catchment is based upon HBA 2017 local board groupings for Auckland Urban South and Rural South (referred to as 'Auckland South'), comprising the following areas:

- Howick
- Māngere-Ōtāhuhu
- Ōtara-Papatoetoe
- Manurewa
- Papakura
- Franklin

FIGURE 2 IDENTIFIED LIGHT INDUSTRIAL LOCAL ECONOMIC CATCHMENT



Source: Property Economics, Google Maps

Auckland South is a highly diverse community. It has large Pacific communities (Māngere-Ōtāhuhu, Ōtara-Papatoetoe, Manurewa), large Māori communities (Manurewa, Papakura) and large migrant communities (Howick, Ōtara-Papatoetoe) on a proportional basis relative to

other areas of the city. This feature makes Auckland South a diverse community and encompasses almost half a million residents., which is around one third of the Auckland region total population base. This scale and population diversity mean that land use within the identified market will need to service demand from the population base of Auckland South primarily.

It is worth noting that this identified area does not represent the entire market, and some industrial activities within the PPC area may also serve the broader Auckland market (and beyond). However, given Property Economics professional experience, Auckland South is the geographic area from which industrial activities at the proposed site would likely primarily service. It is also the primary area where the industrial businesses within the proposed site would have a strategic locational advantage in terms of proximity over other competitors. Therefore, Auckland South is identified as the core catchment throughout the report.

4. INDUSTRIAL EMPLOYMENT MARKET AND TRENDS

This section assesses the current business demographics of the Auckland Region and the Auckland South market by industrial sector. It establishes a factual platform from which future industrial demand can be forecast. Table 1 shows the temporal industrial employment composition for these markets in 2020 according to ANZSIC[1] industrial employment categories. The employment data is sourced from Statistics NZ Business Demographic Database.

Note, a proportion of employees coded within industrial categories can work within other more commercial (office) arms of a business in other locations, i.e., employees in the sales branch of electrical companies are coded in the electricity, gas, water, and waste services. Despite being in a classified industrial industry, these employees are technically not industrial employees for this analysis or absorb industrial GFA. Property Economics has proportioned each industrial sector according to employee type to better differentiate between employee types to reflect the actual number of industrial employees within the Auckland region.

The ratios adopted for categorising the ANZSIC sectors into industrial, commercial, retail, etc., have been based on industrial sectors and compiled based on empirical data such as regional rating databases. These ratios can be found in Appendix 1.

As indicated in Table 1, the Auckland Region has over 248,500 employees in 2020. Specifically, Manufacturing and Construction are the most significant sectors, contributing to around 141,800 job opportunities across the broader area.

[1] *Australia New Zealand Standard Industrial Classification.*

TABLE 1 INDUSTRIAL EMPLOYMENT BY SECTOR, 2020

ANZSIC	Auckland 2020	Auckland South		
		Count	% of AS Total	% of AKL
A-Agriculture, Forestry and Fishing	564	279	0.3%	49%
B-Mining	43	31	0.03%	71%
C-Manufacturing	79,696	37,639	39%	47%
D-Electricity, Gas, Water and Waste Services	1,685	515	0.5%	31%
E-Construction	62,098	16,989	17%	27%
F-Wholesale Trade	59,291	17,531	18%	30%
I-Transport, Postal and Warehousing	39,593	23,264	24%	59%
L-Rental, Hiring and Real Estate Services	5,596	1,299	1.3%	23%
TOTAL	248,565	97,547	100%	39%

Source: Statistics NZ, Property Economics

Auckland South local boards aggregately account for 39% of the Auckland Region total industrial employment, with around 98,000 people identified as employees in 2020. This reflects the significant role of Auckland South as an industrial hub across the region.

Within the Auckland South catchment, Manufacturing and Transport, Postal and Warehousing together account for 63% of the total industrial employment in Auckland South. This equates to around 61,000 employment job opportunities. In particular, Manufacturing is the dominant sector in terms of employment count with over 37,600 employees in 2020. This is followed by Transport, Postal and Warehousing, which accounts for 24% (23,264 employees) of Auckland South total industrial employment.

Given the employment data, it is evident that Auckland South plays a vital role in providing a diverse range of industrial employment in the broader region. This is based on a strong historical industrial base built up over many years in the area meaning the current industrial economy within Auckland South is facilitated well by the existing (occupied) industrial land.

Given that the PPC site is currently vacant and not creating any employment opportunities for the local communities, the PPC would not undermine the existing employment within the area and dampen the holistic industrial performance within Auckland South.

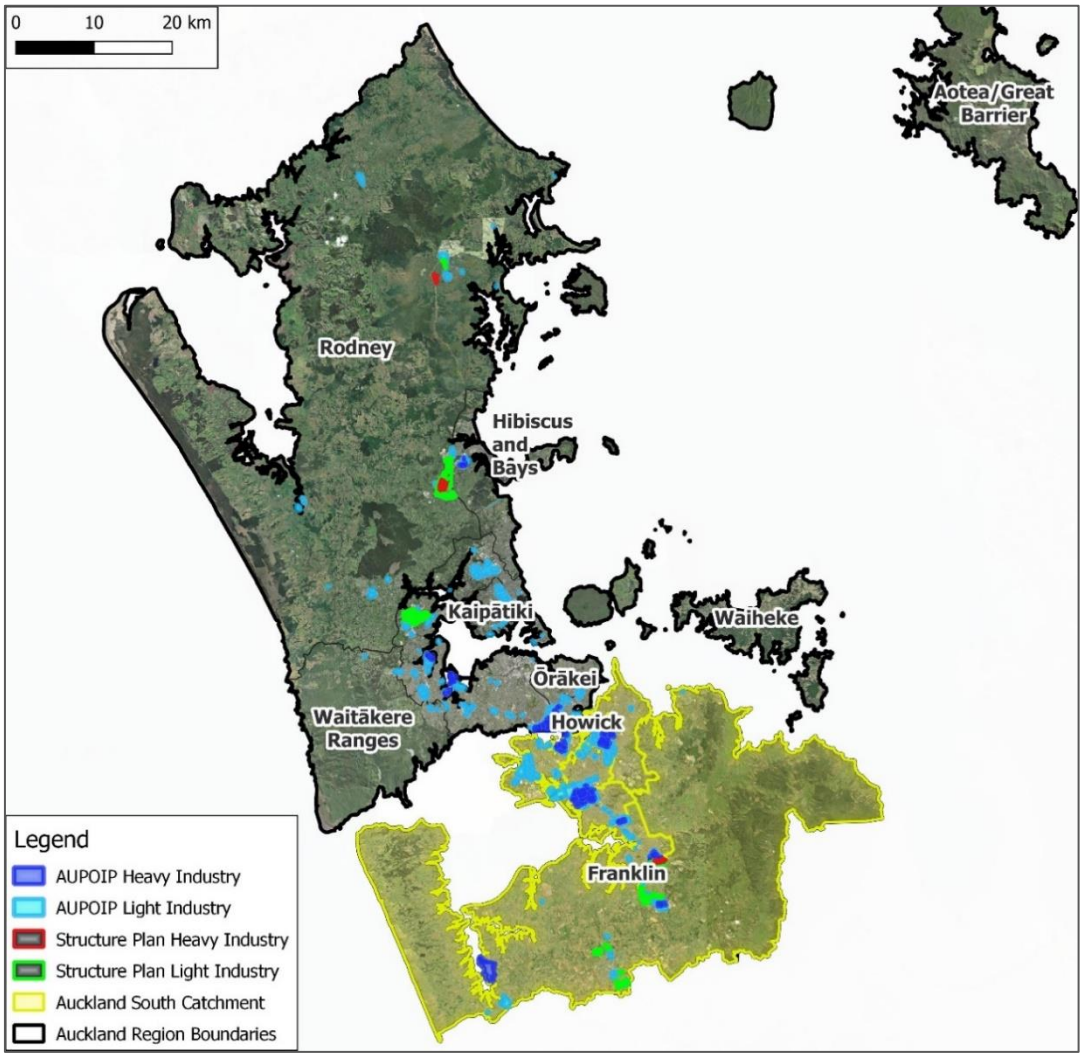
5. INDUSTRIAL LAND PROVISION

This section assesses the industrial land provision across the Auckland region and the identified core market of the PPC based on *Housing and Business Development Capacity Assessment 2017*. This will help to understand the likely impact of the PPC on the industrial land supply of the broader region and the localised industrial market.

5.1. AUCKLAND REGION

As indicated in Figure 3, most zoned industrial land is located in Auckland's main urban areas. In addition to the light and heavy industry zones based upon AUPOIP, the areas identified by Auckland Council promoted Structure Plans are expected to provide a significant level of additional industrial land capacity to facilitate Auckland industrial growth in the long term.

FIGURE 3 AUCKLAND INDUSTRIAL LAND SUPPLY



Source: Auckland Council, Property Economics

As summarised in Table 2, the Auckland region has 6,351ha of land zoned for industrial purposes[2]. Specifically, 684ha of land has been identified as vacant, approximately 11% of the total zoned land. The total capacity for development is estimated to be 2,993ha, 47% of the total zoned area, with potential vacant land included[3].

Light industry dominates the total industrial land provision, also providing around 2,280ha of vacant and vacant potential land to the region. In percentage terms, this equates to 76% of the total industry capacity. In contrast, heavy industry has a vacancy of 109ha, increasing to 713ha when potential vacant land is considered.

TABLE 2 AUCKLAND REGION INDUSTRIAL CAPACITY

	HEAVY		LIGHT		TOTAL	
ZONE/AREA	Area (ha)	Capacity (ha)	Area (ha)	Capacity (ha)	Area (ha)	Capacity (ha)
AUPOIP Zones	**1,870**	**713**	**4,481**	**2,280**	**6,351**	**2,993**
Vacant Land		109		574		684
Vacant Potential Land		604		1,706		2,310
Structure Plan	**187**	**101**	**1,414**	**828**	**1,601**	**930**
Drury-Opāheke	56	24	276	126	332	150
Pukekohe-Paerata	0	0	224	95	224	95
Silverdale West Dairy Flat	98	56	502	293	600	349
Warkworth (est.)	33	21	22	14	55	36
Whenuapai	0	0	390	300	390	300
PC69 - Spedding Block	0	0	52	34	52	34
TOTAL (excl. Vacant Potential Land)	2,057	211	5,947	1,436	8,004	1,647
TOTAL (incl. Vacant Potential Land)	2,057	815	5,947	3,142	8,004	3,957

Source: Auckland Council, Property Economics

In addition to the zoned capacity, it is worth considering the future industrial land areas identified by Auckland Council Structure Plans. Note, Structure Plans have revealed the net developable land in the identified light and heavy industry areas, which is used to proxy the capacities of these future industrial land / areas in Table 2.

Due to data unavailability, the industrial capacity in Warkworth is estimated by Property Economics based on spatial data and a 35% infrastructure assumption. Likewise, zoned land (area) is measured by Property Economics using the boundaries identified by Structure Plans.

[2] *Note, HBA 2017 provides estimates for business land based on various measures, including spatial data, base zone provision, and all provisions. The estimate used in this report is based upon spatial data.*

[3] *'Vacant Potential Land' is defined as sites where building coverage is low.*

A further source of light industrial land supply within the region is PC69-Spedding Block PPC. This proposal provides approximately 52ha of vacant light industrial land to the market, equating to around 34ha of developable land on a 35% infrastructure basis. This would improve the holistic industrial land capacity of the Auckland region.

Based on the estimates, the total industrial land capacity across the region is anticipated to be increased by an additional 930ha in the future, leading to a total capacity of 1,647ha, with Vacant Potential Industrial Land excluded. This is expected to facilitate industrial development across the region further.

Including the Vacant Potential Land total capacity is increased substantially to 3,957ha. Light Industry has around 3,142ha of this total capacity, identifying as vacant or developable with Vacant Potential Land excluded. In contrast, 815ha of land within the Heavy Industry identified as vacant and will be able to facilitate the future growth of the industrial economy of the Auckland region.

Even though the future industrial areas identified by the Spatial Plans will likely be underdeveloped in the short or medium term, providing a large amount of future industrial land across the Auckland region, they will provide surety of supply and efficient operation of the industrial land market in the long term.

While the Auckland HBA typically portrays industrial demand by floorspace, it is possible to assess the likely land requirement to accommodate this level of activity. Tables sourced from the HBA, and Property Economics own assessments estimate the total land demand for industrial activities within the Auckland Region at approximately 1,420ha to 2048[4].

Based on the total industrial and potential capacity of 3,957ha provided in Table 2, Auckland Region has more than sufficient industrial land capacity to meet the projected demand of 1,420ha by 2048. This sufficiency suggests that the PPC will not materially impact the regions' ability to provide for future industrial activities and demand.

5.2. AUCKLAND SOUTH

Based on the floorspace capacity provided by HBA 2017 Appendix C, Property Economics has estimated the future floorspace demand for industrial land in Auckland South. As indicated in Table 3, both Heavy and Light industries have significant capacity remaining after accommodating the projected consumption by 2048.

[4] *Note for Heavy Industrial this applies a 0.37 FAR (Floorspace/Land Area Ratio) and for Light Industrial this applies a FAR of 0.4.*

TABLE 3 AUCKLAND SOUTH FUTURE FLOORSPACE SUFFICIENCY (000 SQM)

SUMMARY (000 SQM)	2028			2048		
	HEAVY	LIGHT	TOTAL	HEAVY	LIGHT	TOTAL
Floorspace Capacity	732	4,077	4,809	732	4,077	4,809
Estimated Consumption (part est.)	313	1,253	1,566	595	2,382	2,977
Residual Capacity (Sufficiency)	419	2,824	3,243	137	1,695	1,832

Source: Auckland City Council, Property Economics

Over the medium-term Auckland South is estimated to have surplus capacity of around 3.3m sqm of industrial floorspace by 2028. This surplus will be decreased to 1.8m sqm by 2048 due to the increased land consumption. Of this surplus, the Light industry accounts for around 93%, equating to 1.7m sqm. This illustrates the high level of excess light industrial capacity over the long term in the Auckland South catchment.

Indeed, as these estimates have not considered the future industrial development identified by Structure Plans, the residual capacity in the Auckland South Light industry is anticipated to be greater than the estimated surplus of 1.8sqm.

Table 4 presents the estimated total industrial land sufficiency within Auckland South over the next 27 years. Note, the estimated capacity and consumption are based on HBA 2017 floorspace capacity and consumption estimates. These estimates are converted into land capacity and consumption based on 0.37 and 0.4 FAR assumptions on Heavy and Light Industry respectively.

In terms of the total existing land area capacity, the 1,200 hectares represents not only the vacant industrial land capacity within the catchment but the additional assessment under the Auckland HBA of the vacant potential land areas (estimated at full hectare equivalents) for industrial use.

As indicated in Table 4, Auckland South has an estimated industrial land capacity of around 1,217ha. Of which Light Industry accounts for approximately 84%, equating to 1,019ha. Having considered the estimated future demand for industrial land, the excess of industrial land capacity is estimated to be approximately 819ha by 2028 and 461ha by 2048. At the sectoral level, it is estimated that all long term Light Industrial demand can be meet within the catchment with a surplus of 424 hectares of capacity.

Given the estimated residual capacity, it is evident that there is more than sufficient (Heavy and Light) industrial land capacity in Auckland South. This suggests that the proposed zone would not be required to meet the projected industrial land requirements through to 2048.

TABLE 4 AUCKLAND SOUTH INDUSTRIAL LAND SUFFICIENCY

SUMMARY (ha)	2028			2048		
	HEAVY	LIGHT	TOTAL	HEAVY	LIGHT	TOTAL
Estimated Capacity (Supply)	198	1,019	1,217	198	1,019	1,217
Estimated Consumption (Demand)	85	313	398	161	595	756
Residual Capacity (Sufficiency)	113	706	819	37	424	461
Structure Plan				24	221	245
Drury-Opāheke				24	126	150
Pukekohe-Paerata				0	95	95
TOTAL SURPLUS CAPACITY	113	706	819	61	645	706

Source: Auckland City Council

A further consideration, as outlined by Table 4 is the introduction of additional structure plan areas that would contribute significantly to the overall catchment's industrial capacity. As acknowledged in Table 2, the areas identified through Structure Plans are expected to supplement industrial land capacity across the region.

Specifically, Drury-Opāheke and Pukekohe-Paerata are located in Auckland South providing additional industrial capacity to the Auckland South market once through the relevant RMA process. Including these relevant plan areas contributes a further 245 hectares of industrial land over the long term. This results in an overall excess of light industrial capacity within the catchment of nearly 650 hectares if all zoned.

This assessment would suggest that the current and future market for light industrial activity within the Auckland South catchment is well catered for both in the short and long terms. In relation the proposed site it would further suggest that this small site is not required for the Auckland or Auckland South industrial markets to operate efficiently.

6. INDUSTRIAL ACTIVITY VIABILITY ASSESSMENT

Location and site characteristics are the most critical factors influencing the viability of a zone for industrial activities. These factors have implications regarding 'industry fit', demand levels, development costs, and the overall potential for the zone's success.

The PPC site forms part of the AUPOIP LIZ in Ōtara. However, the site is intrinsically different from the rest of the LIZ because of its unique location and landform. For instance, inappropriate parcel shape can deter many uses with residual sites often having access limitations or constraining building footprints. The submission site is the case as Highbrook Drive separates it from the broader LIZ on the opposite side of the road and Tāmaki River from the balance of Highbrook. In effect the site is a very narrow and isolated piece of land. This feature increases the uncertainties and extra costs associated with land use and development within the proposed site.

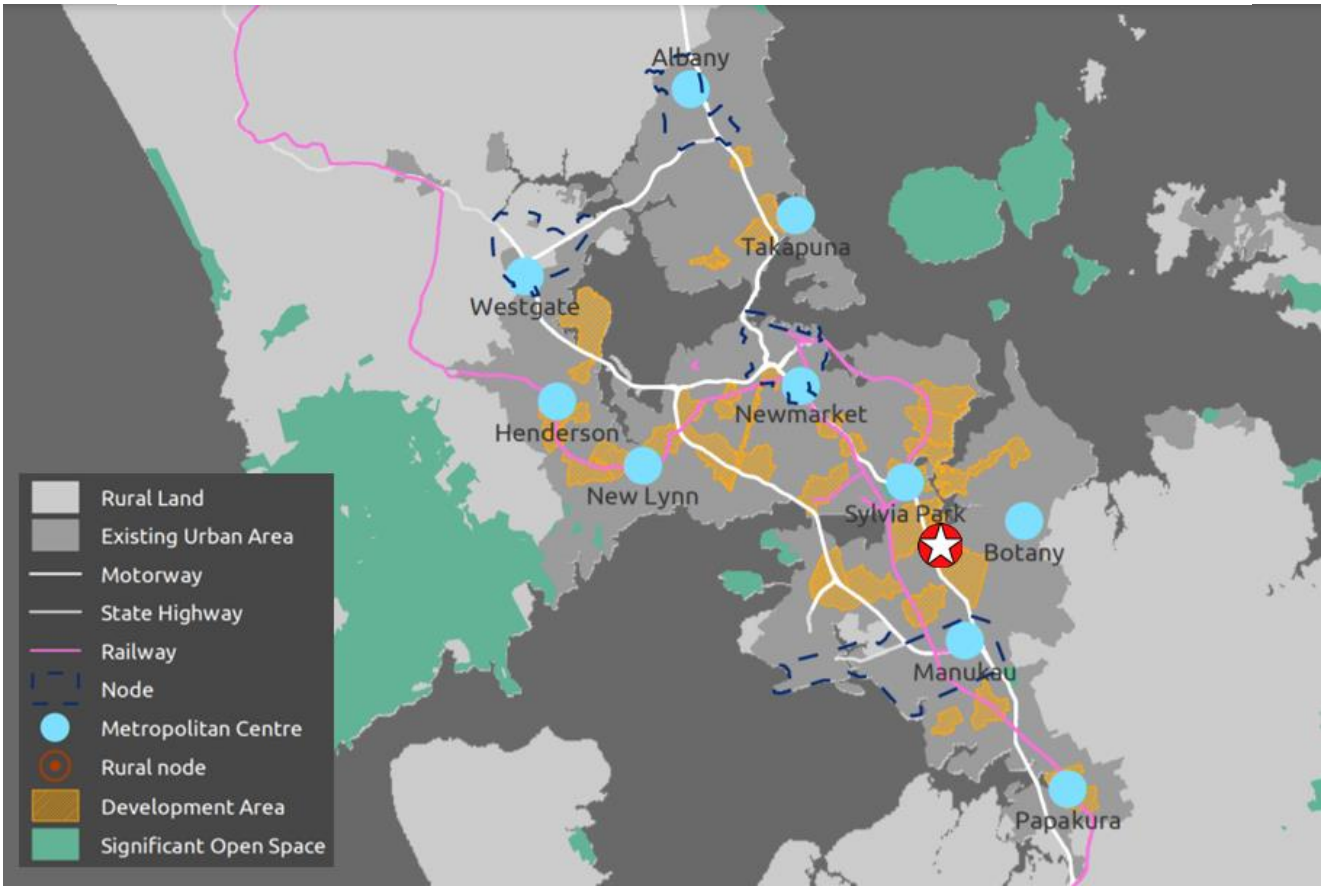
Further, the existing businesses in the adjacent LIZ involve logistics services, electricity providers and utility contractors. One common feature among these businesses is their demand for larger space. However, the proposed site's long and narrow feature (circa 400m long and 35m wide (for the majority of its length)) restricts its potential to accommodate large-scale industrial activities.

Likewise, due to the current landform and site characteristics the site will be unable to allow for an efficient on-site layout and design, especially in relation to manufacturing and warehousing activities. Therefore, the proposed site is not efficient or practical for light industrial activities.

As defined in AUP *H6 Residential-Terrace Housing and Apartment Buildings Zone* (THABZ), high-density residential development is predominantly located around metropolitan, town and local centres. These residential zones need to ensure that residents access services, employment, education, retail and entertainment opportunities, and public open space.

Having identified the proposed site in the context of Auckland Plan 2050 development locations and strategies, the proposed site (the 'RED STAR' in Figure 4 below) has several notable features as a residential location to maximise its land use efficiency. For instance, the site is located between three Metropolitan centres, Sylvia Park, Manukau and Botany. It is also located adjacent to significant industrial sector employment opportunities and in one of the development areas with the broader region. Direct access to State Highway network will allow people to access entertainment and services freely.

FIGURE 4 AUCKLAND PLAN 2050 DEVELOPMENT STRATEGY (PART)



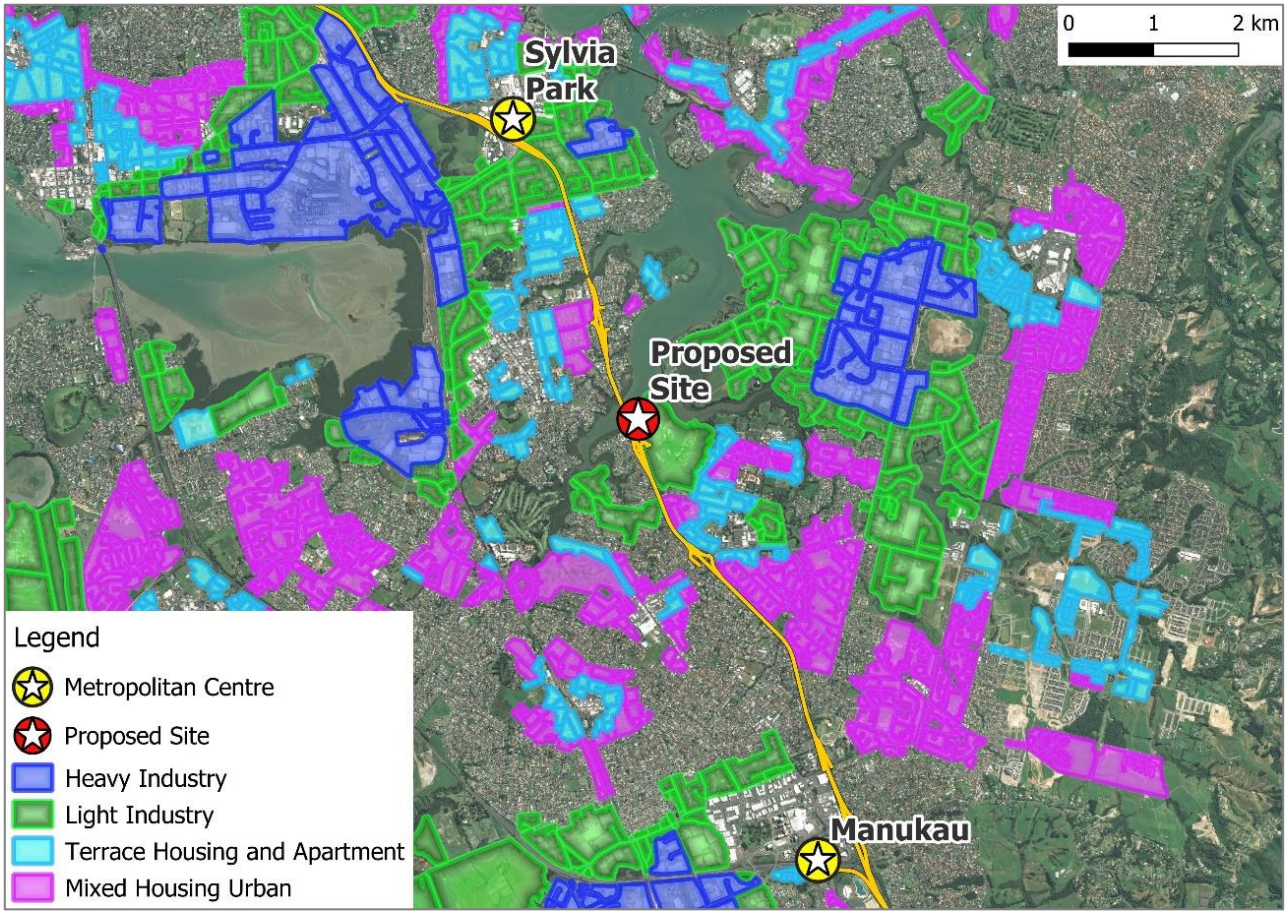
Source: Auckland Council

Additionally, Figure 5 following shows that there are multiple existing high-density residential zones near the PPC site. This reflects the potential of the proposed site to be used for similar residential purposes.

Even though being directly adjacent to the LIZ, there is no direct interface between the proposed site and the wider industrial zone. Therefore, people in the proposed zone are unlikely to be adversely impacted by the existing industrial activities across the road. Indeed, Highbrook Drive will be able to act as a natural buffer to manage any potential reverse sensitivity effects.

Having assessed the location of the proposed site in the context of the surrounding zones, the PPC to rezone the proposed site to high-density development is considered more appropriate to use of the land and leverage the unique locational and characteristics of the site. This would, in turn, ensure an efficient land use of the site that in all likelihood might otherwise remain unutilised.

FIGURE 5 EXISTING INDUSTRIAL AND RESIDENTIAL ZONES



Source: Property Economics, Auckland Council

7. SUMMARY

The purpose of this report is to assess the high-level economic grounds of rezoning the PPC site from the current AUPOIP Light Industrial Zone (LIZ) to Terrace Housing and Apartment Buildings Zone (or Mixed Housing Urban Zone).

According to HBA 2017, the Auckland Region has the equivalent industrial capacity around 2,993ha, which consists of 2,280ha of Light Industrial land and 713ha of Heavy Industrial land. Considering the industrial areas proposed by Council Structure Plans, the total industrial land capacity is estimated at approximately 3,957ha cross the region. In contrast to the predicted total industrial land demand of around 1,420ha in the region, these estimated capacities are more than sufficient so that the PPC would not undermine the industrial performance of the broader region.

Auckland South is estimated to have around 1,217ha of total equivalent industrial land capacity, with Structure Plans excluded. Of this 1,217ha, 1,019ha of capacity is identified as LIZ. This would result in an estimated surplus capacity of 819ha by 2028 and 461ha by 2048 for industrial activities. It is evident that there is more than sufficient industrial capacity in Auckland South. Including the Structure Plans, the total surplus capacity of LIZ would be 706ha by 2028 and 645 by 2048, suggesting that the PPC site is not required to accommodate the projected industrial land demand to 2048. In total, the industrial land capacity is estimated to have a surplus of 819ha by 2028 and 706ha by 2048, with Structure Plans included.

This report also assesses the locational attributes of the PPC site for light industrial activities. Given its unique locational characteristics and narrow width, the PPC site is not suitable or practical for light industrial activities. This is because industrial businesses (such as the existing logistics and warehousing businesses in the wider Light Industry zone) typically require relatively large space, truck moveability and accessible routes. However, this is not the case for the proposed site, where sufficient and developable land appears to be limited.

The currently vacant status of the proposed site also indicates that the land is not as attractive to industrial activities. With the site likely to remain vacant under the current LIZ provision, more appropriate zoning is required to leverage the site's locational characteristics for more suitable land uses. As an alternative, a zone enabling high-density residential development is considered a more appropriate to fit the locational characteristics of the site. This is mainly attributed to the site's proximity to existing metropolitan centres, transport networks and large employment hubs.

In summary, this report shows that the proposed PPC will not undermine the industrial land sufficiency of the localised catchment and the wider region, while maximising the land-use efficiency of the site.

APPENDIX 1: INDUSTRIAL BUSINESS CLASSIFICATIONS

Property Economics utilises the 2006 Australian and New Zealand Standard Industrial Classification (ANZSIC) as guidance, whereby businesses are assigned an industry according to their predominant economic activity.

Industrial activities in general refer to land extensive activities, it includes part of the primary sector, largely raw material extraction industries such as mining and farming; the secondary sector, involving refining, construction, and Manufacturing; and part of the tertiary sector, which involves distribution of manufactured goods. The employees work for the following sectors are considered an industrial sector employee:

- 10% of Agriculture, Forestry and Fishing
- 10% of Mining
- Manufacturing
- 30% Electricity, Gas, Water and Waste Services
- Construction
- Wholesale Trade
- Transport, Postal and Warehousing
- 40% Rental, Hiring and Real Estate

Highbrook Plan Change

Integrated Transport Assessment

PREPARED FOR HIGHBROOK LIVING LIMITED | JULY 2022

Stantec

Revision Schedule

Rev No	Date	Description	Signature of Typed Name (documentation on file)			
			Prepared by	**Checked by**	**Reviewed by**	**Approved by**
1	11/03/2022	First Draft	ZC/AJ	HP	DJM	DJM
2	17/03/2022	Final Draft	AJ	HP	DJM	DJM
3	01/07/2022	Final	AJ	HP	DJM	DJM

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Quality Statement

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Executive summary

Stantec has been commissioned by Highbrook Living Limited to prepare an Integrated Transport Assessment (**ITA**) as part of a Private Plan Change request. The Plan Change seeks to rezone the western part (on the western side of Highbrook Drive) of the Applicant's wider landholding at 8 Sparky Road in Highbrook from Business – Light Industry Zone to Residential – Terrace Housing and Apartment Building Zone under the Unitary Plan. The concept of development within the THAB zoned land would then be to deliver residential development that may potentially include up to eight five-storey apartment blocks, a dairy, a café, a shared office space, approximately 10 standalone houses, and some 15 terrace houses. The concept for development within the THAB zoning on the subject land would therefore include a development scale of up to approximately 200 dwellings. This ITA assesses the traffic effects of the proposed rezoning as well as the ability of the surrounding existing and proposed transport network to support the development potential of the proposed Plan Change.

The Plan Change area, located approximately 14 km south of the Auckland Central Business District, is currently vacant however there is some industrial activity within the wider 8 Sparky Road site on the eastern side of Highbrook Drive. Further development of the eastern portion of the Applicant's land is currently in a preliminary planning phase.

The Plan Change area lies at the confluence of several major roads including Highbrook Drive, SH1 and Hellabys Road, and as such has excellent connectivity to the wider Auckland region. Despite this, vehicle access to the external road network to/from the Plan Change area is currently constrained to the current single lane, giveway controlled, left-in/left-out access of the site's connection to Highbrook Drive.

The Highbrook area and its supporting roading network is currently arranged to provide higher levels of service and access by private vehicles due to the historical development of industrial land-use activity and proximity of and accessibility by SH1 and the supporting arterial roads. There is currently limited active transportation within the Highbrook area due to the largely industrial land use, and the area is currently serviced by only two bus routes accessed via bus stops approximately 2 km away from the Plan Change site. The Plan Change proposal looks to enhance this connectivity and accessibility by a range of transport modes and will look to contribute to the enhancement of alternative travel modes in association with other land use development and public agency projects over the life of the Plan Change and its facilitated development.

As part of the Plan Change process, it is recommended that a bus stop is provided along the site frontage on Highbrook Drive to provide access to Bus Route 351 that already travels along this route. This will provide a regular connection between the site and Ōtāhuhu on the western end, and Botany on the eastern. A shuttle service is also recommended to be included in future transport plans and provisions associated with the development within the Plan Change area to further encourage active transport uptake. Details of the service should be determined in coordination with AT and other stakeholders including future residents as to the timings and destinations of the shuttle as to provide a service that would encourage the most public transportation uptake.

Vehicular access to the site will be via the proposed new four-arm signalised intersection (being delivered as part of the industrial land development within the balance part of the 8 Spark Road site), which will be located approximately 500m north of the Highbrook Drive interchange roundabout.

To consider the traffic impact of the proposed Plan Change on the surrounding road network, consideration will be given to the traffic impacts of the Plan Change development in comparison to a baseline scenario in which the site is developed with light industry, as per the current zoning. The traffic modelling shows that there are no significant differences between the baseline and development scenario, and while the extensive delays at the site intersection are not acceptable, it shows that this largely reflects existing wider network issues rather than caused by the Plan Change development. In this regard and reflecting the findings of other planning case law (such as the Landco Mount Wellington case in relation to the Stonefields development) around the responsibility of solving regional transport constraints, the resolution of these issues more properly sits with the transportation authorities rather than developers or Applicants.

Further modelling and analysis would be expected to be undertaken as part of subsequent resource consent applications for development at the site, however it is concluded the rezoning the site from Business - Light Industry Zone to Residential – Terrace Housing and Apartment Building Zone will have minimal impact on the surrounding road network. For the reasons set out in earlier sections with regard to active and public transport modes, the promotion of opportunities for future residents to adopt those non-private vehicle travel modes and requirement for the Applicant to actively participate in the provision of those walking, cycling and public transport enhancements, it is considered that the overall transport effects associated with the Plan Change are appropriate.

The development enabled by the Plan Change rezoning as sought is consistent with current government transport policies.

This ITA report concludes that the Plan Change will enable a development form and scale that is appropriately responds to its location and there is no traffic engineering and transport planning reason to preclude acceptance of the proposal.

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1 Introduction

Stantec has been commissioned by Highbrook Living Limited (**the Applicant**) to prepare an Integrated Transport Assessment (**ITA**) report in support of a Private Plan Change (**the Plan Change**) to the Auckland Unitary Plan - Operative in Part (**Unitary Plan**). This Plan Change seeks to rezone the western part (on the western side of Highbrook Drive) of the Applicant's wider land holding at 8 Sparky Road in Highbrook from Business - Light Industry Zone to Residential – Terrace Housing and Apartment Building Zone under the Unitary Plan. The Plan Change further seeks to apply precinct provisions to facilitate the transition from undeveloped to a residential area in an integrated and comprehensive manner.

The Plan Change area is bounded by Highbrook Drive to the south and State Highway 1 (**SH1**) to the west. The rezoning proposed will facilitate residential development of up to approximately 200 residential dwellings on the site with some minor supporting developments such as a café and convenience stores.

The transportation issues that are central to this Plan Change include:

- The existing accessibility of the site to various modes of transportation;
- The ability of the design of the site to encourage a variety of transport modes to and from the site for future residents, employees, customers, and visitors;
- The ability of the development enabled by the Plan Change to be completely self-sufficient, in that any infrastructure costs required to mitigate the effects of the development will be fully met by the Applicant; and
- The ability of the proposal to be consistent with key national, regional, and local policies relating to the site accessibility and sustainability.

By way of summary, this report establishes that from a traffic and transportation perspective there is no reason to preclude acceptance of the Plan Change as described.

2 Plan Change Area

The Plan Change area encompasses the northern portion of the site located at 8 Sparky Road, Highbrook. **Figure 1** shows the Plan Change area in relation to existing site[1].

Figure 1: Plan Change Area in relation to 8 Sparky Road

The Plan Change area is located approximately 14 km south of the Auckland Central Business District, approximately 1.8 km west of the Highbrook Business Park and 5 km north of Manukau Town Centre.

Figure 2 shows the Plan Change area in the context of the existing surrounding road network[2].

[1] Aerial photograph background sourced from the Auckland Council GeoMaps database
[2] Aerial photograph background sourced from the Auckland Council GeoMaps database

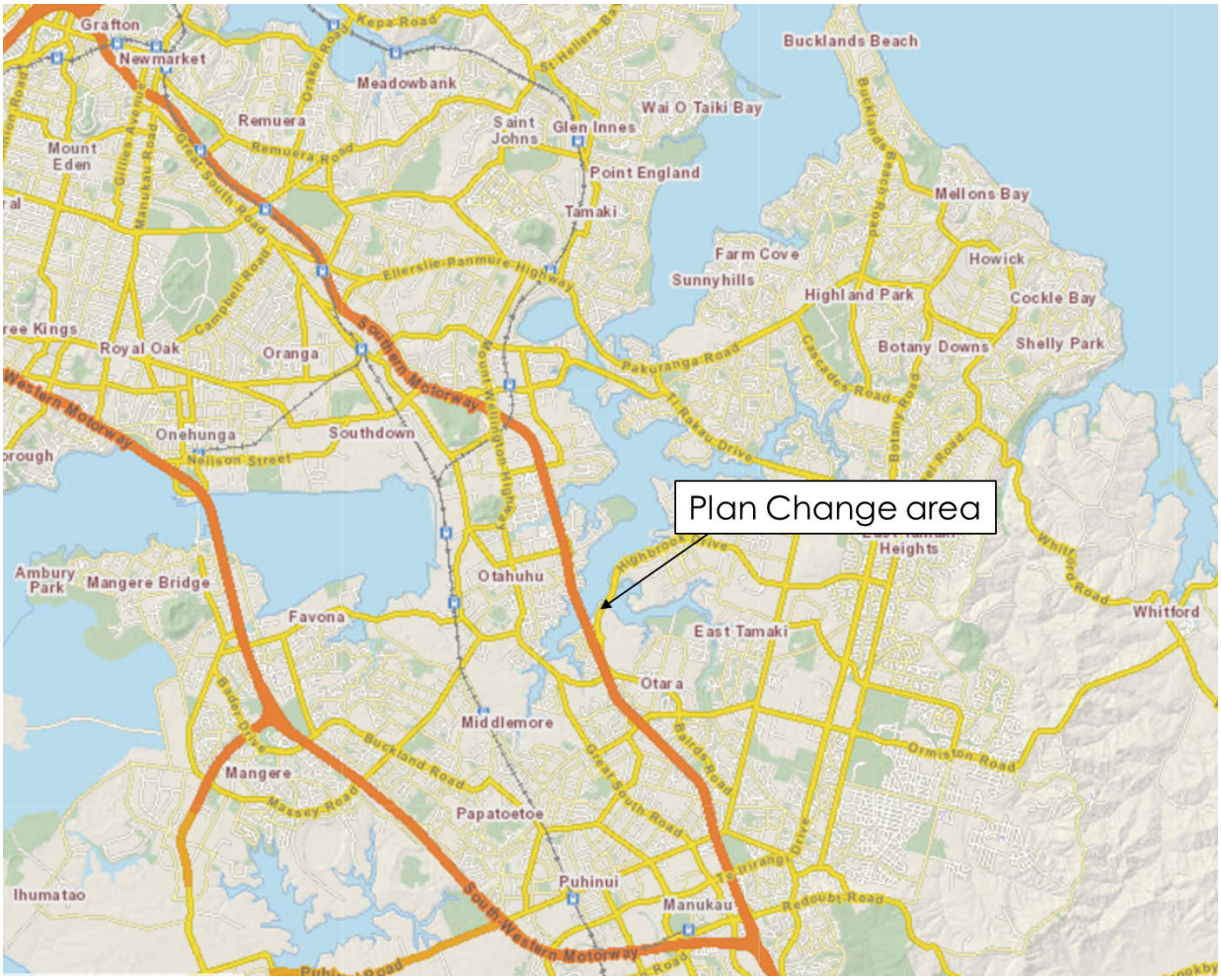

Figure 2: Site Location in the context of the surrounding road network

The Plan Change area forms part of the former Ōtāhuhu power station site and is bounded by Highbrook Drive to the south, the Tāmaki River to the north and SH1 to the west. SH1 runs north south to the west of the site, with motorway ramps at the Highbrook Drive / SH1 interchange and associated roundabout, approximately 460 m south of the site. The site currently has access to the wider road network via a single lane left-in/left-out access on Highbrook Drive. A proposed signalised intersection serving the industrial land within the Applicant's wider landholding is shortly to be constructed along the Highbrook Drive frontage of the Plan Change site.

The Plan Change area is currently vacant, however, there is some industrial activity within the wider 8 Sparky Road site on the eastern side of Highbrook Drive. Further development of the eastern portion of the Applicant's land is currently in a preliminary planning phase.

Highbrook Business Park is located approximately 1.8 km northeast of the site which includes various commercial and industrial activity. The Highbrook Business Park also include a small supermarket, restaurants, recreational facilities, and banking facilities.

The Plan Change site is also located approximately 2.5 km from the Ōtāhuhu industrial area and 4km from the East Tāmaki industrial area, respectively.

There are also a number of educational facilities in the vicinity of the site including Wymondley Road Primary School approximately 400 m west of the site (as the crow flights), Bairds Mainfreight Primary School and Kindergarten 1.9 km south of the site, and Manukau Institute of Technology approximately 2 km south of the site.

Overall, the site has good access to a variety of complementary activities in the surrounding area including to a number of employment and commercial areas.

2.1 Existing Planning Context

The Plan Change area is currently zoned Business – Light Industry under the Unitary Plan as shown in **Figure 3**[3].

The land use to the west of the site (on the western side of the Southern Motorway) is zoned Residential – Mixed Housing Suburban Zone and the land use to the south (southern side of Motorway within Otāhuhu) is a mix of Residential – Terrace Housing and Apartment Building Zone and Residential – Mixed Housing Urban Zone.

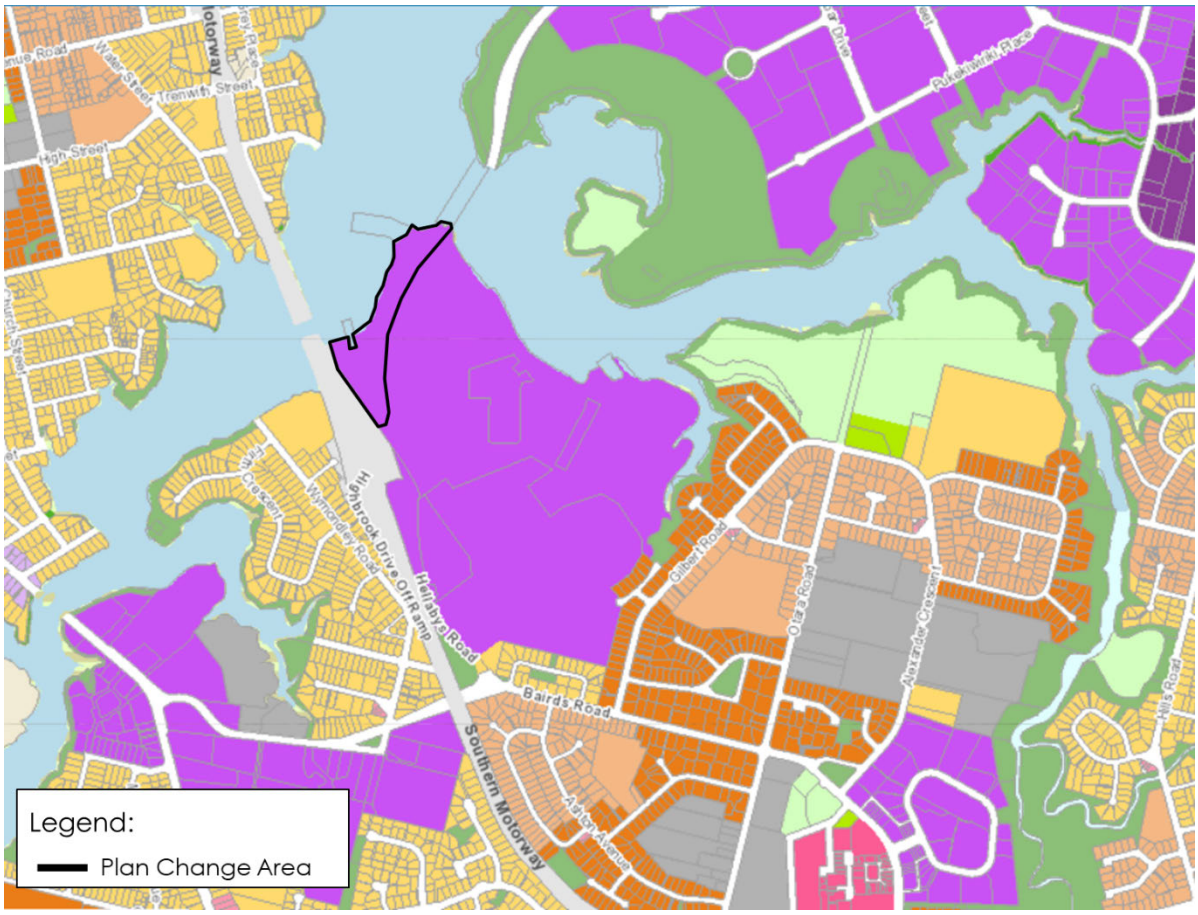

Figure 3: Current Zoning of Plan Change area

[3] Unitary Plan background sourced from the Auckland Council Auckland Unitary Plan database

3 Existing Transport Environment

3.1 Existing Road Network

The existing key transport links surrounding the Plan Change area are described in the following sections.

3.1.1 Highbrook Drive

Highbrook Drive forms the southern boundary of the site. The road is classified as an arterial route under the Unitary Plan and connects to SH1 and Hellabys Road at its western end and Allens Road at its eastern end. All three of these roads are classified as arterial routes under the Unitary Plan. In this role as an arterial road Highbrook Drive is expected to provide the primary access from SH1 to east Auckland including connecting with the suburbs of East Tāmaki and Botany.

Within the vicinity of the site, Highbrook Drive has an approximate carriageway width of 19m which accommodates two traffic lanes in each direction separated by a 3 m wide solid median. On-street parking is not permitted along this section of the road.

Highbrook Drive has a posted speed limit of 60 km/h along the majority of its length, and then reduces to 50 km/h within 250 m of the SH1 / Highbrook Drive roundabout.

3.1.2 State Highway 1

SH1 is a regionally significant primary arterial and motorway link that extends north-south through Auckland (with connections beyond). Within the Auckland area, SH1 provides access to key centres such as Auckland CBD, Newmarket, Manukau and Manurewa. It runs in a north south direction to the west of the Plan Change area and plays an important through connection through the region as well as direct connection to the surrounding Highbrook area. The Unitary Plan classifies the motorway as an arterial route where the function of such routes is to cater for through movements with less emphasis on providing access to abutting properties.

The Plan Change area connects to SH1 at the SH1 / Highbrook Drive roundabout which is located on the south-western corner of the Plan Change area. Access onto the motorway is controlled via traffic signal “meters” managed and controlled by Waka Kotahi | New Zealand Transport Agency (**Waka Kotahi**).

SH1 has a posted speed limit of 100km/h for both directions. In the vicinity of Highbrook, SH1 typically accommodates three lanes in each direction separated by median barriers.

3.1.3 Hellabys Road

Hellabys Road is classified as an arterial road under the Unitary Plan.

It connects to Highbrook Drive at its northern end and Bairds Road at its southern end. All three of these roads are classified as arterial routes under the Unitary Plan. It is a key route connecting SH1 to Ōtara and the Manukau Institute of Technology (**MIT**).

Hellabys Road forms part of the western boundary of the wider 8 Sparky Road site which gains access to the wider road network at the Hellabys Road / Gridco Road intersection. In the vicinity of the site, Hellabys Road has an approximate carriageway width of 8m which accommodates one lane in each direction separated by a marked centreline. The posted speed limit is 50km/h.

Summarily, it can be noted that the site is well connected to the surrounding suburbs and to the wider Auckland region via the arterial and state highway road network.

3.2 Existing Traffic Volumes

The most recent traffic counts for the surrounding non-state highway roads have been obtained from the Auckland Transport (**AT**) traffic count database and are summarised in **Table 1** below.

Table 1: Daily and Peak Hour Traffic Counts

Road	Location	Count Date	7-Day ADT (vpd)	5-Day ADT (vpd)	AM Peak Volume (vph)	PM Peak Volume (vph)
Highbrook Drive	Between SH1 /Highbrook roundabout and Highbrook Drive bridge	May 2021	39,350	45,659	3,530	3,500
Hellabys Road	Between SH1 / Highbrook roundabout and Gridco Road	August 2019	11,500	12,990	1,030	1,290

Overall, the current traffic volumes on the roads in the vicinity of the Plan Change area are considered to be generally consistent with the expected functions of these roads within the road network from a transport perspective.

3.3 Existing Accessibility

3.3.1 Private Vehicles

The Plan Change area lies at the confluence of several major roads including Highbrook Drive, SH1 and Hellabys Road, as detailed in Section 3.1, and as such has excellent connectivity to the wider Auckland region. Despite this, vehicle access to the external road network to / from the Plan Change area is currently constrained to the current single lane, giveway controlled, left-in/left-out access of the site's connection to Highbrook Drive.

3.3.2 Public Transport

A map showing the public transport network surrounding the Plan Change area is shown in **Figure 4.**

As shown, Bus Route 325 runs along Highbrook Drive along the site frontage, however there are no existing bus stops located on Highbrook Drive in the vicinity of the Plan Change area. The nearest operational bus stops to the Plan Change area are located on Bairds Road, approximately 2km south of the site – a walk of approximately twenty minutes[4]. This bus stop serves the following bus routes:

- Bus Route 325: Connecting Manukau to Mangere via Ōtāhuhu
- Bus Route 351: Connecting Ōtāhuhu to Botany

Under AT's New Network Bus Route 325 is defined as a connector service, operating at frequencies of at least 30 minutes respectively from 7:00 am to 7:00 pm, seven days a week. Bus Route 351 is defined as a local service, operating every 20 minutes during peak hours and every 30 minutes during off-peak periods.

Bus Routes 325 and 351 (supported by somewhat extended walking distances) connect the site to various public transport hubs such as Ōtāhuhu, Ōtara, and Botany from which a number of more frequent bus and train services operate to provide access across the wider Auckland metropolitan area.

[4] At a typical walking speed of 1.2 metres per second (**m/s**).

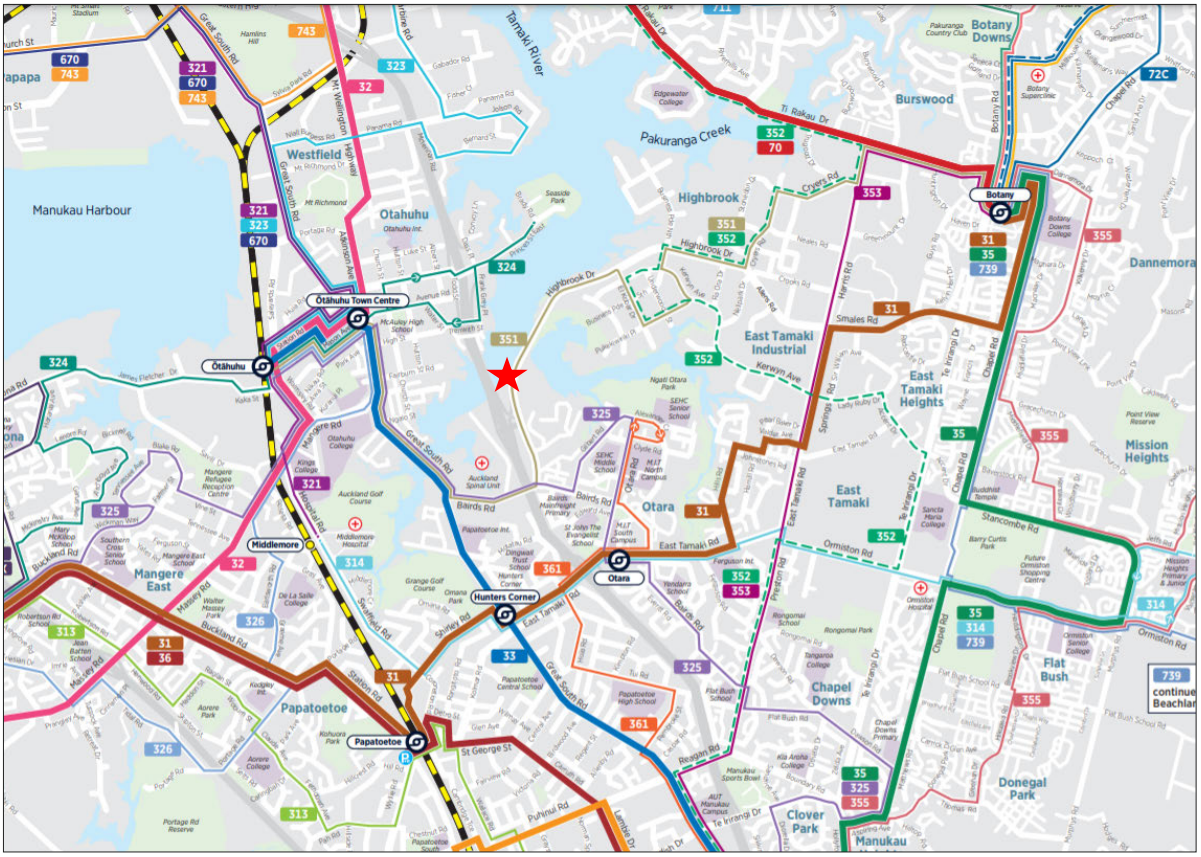

Figure 4: Public Transport Network (source: Auckland Transport)

In general, the existing public transport services are relatively limited in the area, given the walking distance to the nearest bus stop and the frequency of the bus services.

3.3.3 Walking and Cycling

There are shared paths[5] provided on both sides of Highbrook Drive in the vicinity of the site. The shared path on the northern side of Highbrook Drive connects to an off-road shared path that runs along SH1 to McManus Place to the west of the Plan Change area. To the east, the shared path connects to an off-road, shared path that runs along the Tāmaki River. The shared path on the southern side of Highbrook Drive continues through the Highbrook Drive interchange roundabout to Hellabys Road.

There is a footpath that runs along the Highbrook Drive overbridge which provides access to the western side of SH1 and on-road connections to the Otāhuhu Town Centre. To access the facility, pedestrians are required to informally cross the road on the southern side of the Highbrook Drive/Hellabys Road roundabout where dropped kerbs and tactile pavers are provided.

There is a dedicated formal pedestrian crossing facility located approximately 210 m north of the Highbrook Drive interchange roundabout in the form of a signalised midblock pedestrian crossing.

Whilst there are shared paths on both sides of Highbrook Drive, the site is located more than 2 km from any complementary activities such as the Highbrook Business Park, the MIT, and the nearest supermarket and shopping centres in Otāhuhu or Otara Town Centres – requiring a walk-time of approximately 30 minutes.

In this regard, walking in the vicinity of the Plan Change area is likely to be primarily for recreation along the Tāmaki River rather than for commuting or business, however, as will be discussed in subsequent sections of this report, further additions to the walking network are proposed as part of the wider development plans of the Applicant's land holding especially on the eastern side of Highbrook Drive.

[5] Noting that their current form and dimensions do not fully meet current AT design expectations for full shared path facilities

3.3.4 Summary

The Highbrook area and its supporting roading network is currently arranged to provide higher levels of service and access by private vehicles due to the historical development of industrial land-use activity and proximity of and accessibility by SH1 and the supporting arterial roads. There is currently limited active transportation within the Highbrook area due to the largely industrial land use, and the area is currently serviced by only two bus routes accessed via bus stops approximately 2 km away from the Plan Change site. The Plan Change proposal looks to enhance this connectivity and accessibility by a range of transport modes and will look to contribute to the enhancement of alternative travel modes in association with other land use development and public agency projects over the life of the Plan Change and its facilitated development.

4 Road Safety

A search of the Waka Kotahi Crash Analysis System for all reported crashes for the full five-year period between 2016 to 2020, plus all available crash records from 2021 for the following search area:

- Midblock on Highbrook Drive between SH1 / Highbrook Drive roundabout and a point 100 m north of the site;
- 50 m radius at the SH1 / Highbrook Drive roundabout, including the SH1 northbound on-ramp;
- 50 m radius at the SH1 northbound on-ramp / Highbrook Drive overbridge intersection;
- Full length of Highbrook Drive overbridge;
- Full length of Hellabys Road.

Crashes on SH1 below the overbridge were not included in this analysis.

Figure 5 illustrates the crash study area.

Figure 5: Crash Study Area

A total of 75 crashes were recorded within the defined study area and period, of which only one resulted in a serious injury and 11 resulted in minor injuries. No fatal crashes were reported within the defined study area.

Table 2 provides a summary of the crash location and type.

Table 2: Crash Summary

Location	Crash Type					
	Lane Changing / Merging	Rear End	Failure to Give-Way	Lost Control	Other	Total
SH1 / Highbrook Dr roundabout	14	12	15	4	2	47
Highbrook Drive	3	1		3	2	9

Location	Crash Type					
	Lane Changing / Merging	Rear End	Failure to Give-Way	Lost Control	Other	Total
Hellabys Road				1	2	3
SH1 NB On-Ramp/Overbridge (signals)		3	3	4	2	12
SH1 NB On-Ramp		2				2
Hellabys Road / Gridco Road				1		1
SH1 SB On-Ramp	1					1
Total	18	18	18	13	8	75

As shown above, the majority of the crashes (63%) occurred at the Highbrook Drive interchange roundabout. The three main causes of crashes at the roundabout were lane-changing or merging, rear end or failure to give-way. A large portion of the lane-changing crashes occurred when vehicles were in the incorrect lane to exit the roundabout, resulting in vehicles suddenly changing lanes close to the roundabout exit. The high number of rear end crashes is likely a reflection of the congested nature of the roundabout where drivers are not expecting vehicles in front to suddenly stop.

A more detailed breakdown of the 11 minor injury and one serious injury crash is as follows:

- Six minor injury crashes and one serious injury crash occurred involving vehicles losing control and colliding with an obstruction – two on the roundabout, three crashes on Highbrook Drive and two crashes associated with vehicles turning right from SH1 Northbound Off-Ramp onto the overbridge. Alcohol was suspected in four of these crashes;
- Two minor injury crashes occurred when vehicles were entering the roundabout from the Highbrook Drive overbridge and failed to give way to vehicles on the roundabout;
- One minor injury crash occurred when a vehicle travelling from Highbrook Drive onto the overbridge was in the wrong lane and collided with an opposing vehicle when attempting to change lanes to exit the roundabout;
- One minor injury crash occurred when a heavy vehicle rear ended another vehicle;
- One minor injury crash occurred when two vehicles were merging on Highbrook Drive.

Whilst there are a high number of crashes at the Highbrook Drive interchange roundabout intersection, the crash patterns are broadly consistent with what could be expected from a busy arterial road that connects to a significant, highly trafficked motorway such as SH1. The other locations have typical crash records associated with the surrounding environment and it is considered that there are no inherent safety concerns with the current road design in support of the Plan Change.

5 Future Strategic Transport Network

The future transport context surrounding the Plan Change site has been assessed to understand and allow for any future, potential changes in the network relevant to the proposed Plan Change.

Auckland Transport's Future Connect programme set out the long-term network plan for Auckland's transport system and identifies the most important parts of the transport network and any critical issues or opportunities for active modes, public and private transport. It incorporates information from the 10-year Regional Land Transport Plan (**RLTP**) to identify these issues and opportunities.

A screenshot of the Plan Change area from the Future Connect programme over the first decade is shown in **Figure 6**.

Figure 6: Future Connect Plan (first decade)

This provides a high-level summary of the different transport modes proposed to be in place within the area in the next 10 years. As can be seen, Highbrook Drive at the site frontage is classified as a major cycling network link connecting to the north and south, as well as to SH1 to the west. As previously mentioned, shared paths are provided on each side of Highbrook Drive with no change expected in the local network from existing AT plans in the next decade.

6 Plan Change

6.1 Overview

The Applicant is requesting to rezone the land to the west of Highbrook Drive through a Private Plan Change to enable residential development to occur. The Plan Change seeks to rezone the western portion of the property at 8 Sparky Road from Business - Light Industry Zone to Residential – Terrace Housing and Apartment Building Zone (**THAB**) under the Unitary Plan. The concept of development within the THAB zoned land would then be to deliver residential development that may potentially include up to eight five-storey apartment blocks, a dairy, a café, a shared office space, approximately 10 standalone houses, and some 15 terrace houses.

This application considers 200 dwellings on the site, should an increased in dwellings be considered in the future, this will be considered as a Restricted Discretionary Activity and will therefore be subject to a revised ITA.

The Plan Change further seeks to apply precinct provisions to facilitate the transition from undeveloped to a residential area in an integrated and comprehensive manner. It is also evident that from a transportation perspective, the site is less than fit for purpose under its current zoning due to the geographical constraints of the property, which make turning circles for industrial vehicles such as semitrailers impractical to design for.

Vehicular access to the site will be via the proposed new four-arm signalised intersection (being delivered as part of the industrial land development within the balance part of the 8 Spark Road site), which will be located approximately 500m north of the Highbrook Drive interchange roundabout.

On-site parking for residents and visitors will be provided at a rate that supports urban amenity, efficient use of the land and the functional requirements of the residential and supporting retail land uses. The exact number of spaces will be confirmed at the resource consent stage; however, it is anticipated that the supply will accommodate the expected demand based on similar developments in the area, without impacting the surrounding road network.

6.2 Public Transport

The existing local public transport network provides limited options to and from the proposed development with two bus services in the vicinity of the development however no bus stops within a 20-minute walk of the site. Notably, despite travelling through Highbrook Drive directly, Bus Route 351 does not stop on Highbrook Drive at any point.

It is therefore recommended as part of the transport provisions supporting the Plan Change that in order to increase connectivity of the development to the wider public transport network, particularly the rapid transit network given the site's distance from the central city, a new bus stop is provided along Highbrook Drive near the signalised entry to the development that will be serviced by Bus Route 351. These bus stops will specifically be located on the departure sides of the signalised entry to the Plan Change site for maximum efficiency and safety in access. Additionally, the stops should be of high amenity to further promote use, such as the inclusion of shelters. This is expected to increase the mode share of public transport to and from the site providing a connection to Ōtāhuhu Town Centre, Ōtāhuhu Train Station, the Highbrook Business Park, and Botany Town Centre.

To further support public transport mode share, a shuttle service should be considered to directly connect the development with nearby public transport hubs such as the Middlemore and Ōtāhuhu train stations. This should be arranged in consultation with Auckland Transport and other stakeholders (potentially the on-site resident community/body corporate or similar) to maximise its efficacy in terms of timing and preferred destination. This will allow for decreased trip time to the wider public transport and rapid transit network for longer journeys, in addition to covering the lack of service of Bus Route 351 on weekends.

6.3 Walking and Cycling

Walking and cycling connections to the Plan Change site are currently provided via modest standard shared paths on each side of Highbrook Drive. The development will connect into and be served by the new four-arm signalised intersection in front of the Plan Change area. that is under construction at the time of the writing of this report It will provide a dedicated, safe crossing location for pedestrians and cyclists across all approaches.

While the upgraded intersection and shared paths on Highbrook Drive provide a direct connection to the Plan Change site, there are a number of existing "pinch points" where connection to the wider active transport network is difficult, such as to cross over SH1 to the west to gain access to the Otāhuhu Town Centre. In general, given the existing industrial nature of the area, active transport facilities in the surrounding network are not of the highest quality. The introduction of residential activity to the network will allow for an increase in active transport mode, given improved infrastructure is provided. It is thus recommended that future development within the Plan Change area proceeds uptake of every opportunity to enhance those walking and cycling connections to nearby attractors (existing or future) for residents in consultation with AT (and thus in alignment with the Traffic Design Manual) and other stakeholders in the area.

Such enhancements are underway already including a signalised intersection with pedestrian crossings at the entrance to the opposing industrial development and to the existing Plan Change site. Additional enhancements will include the extension of existing crash barriers around the Highbrook Drive, SH1, and Hellabys Road roundabout intersection to the western side. The current pedestrian crossing facilities on the Hellabys Road approach to the aforementioned roundabout intersection consist only of an unprotected island. As this crossing will be the only way to cross SH1 from the Plan Change area, enhancements should be made to the safety of those crossing by way of signage or paved coloured area, including to the awareness of vehicles approaching the crossing on the road, however, a fully signalised crossing would result in unacceptable delay to motorists. Finally, wayfinding improvements should be made to encourage pedestrian use of safe crossings and direct to local amenities.

It is noted that these connections must be made with consideration as to the volumes and speeds of traffic in the local roading network. This would mean, given the 50 km/h posted speed limit and high traffic volumes, separated cycle paths would be required. The importance of increased safety measures is further exasperated given the site's location between two Level 1A freight routes (SH1 and Highbrook Drive), resulting in a higher than otherwise usual heavy vehicle share.

6.4 Road Safety

The crash analysis showed no consistent crash pattern in the development area outside of that typical for an area such as that local to the Plan Change area, nor any existing issues that would be exacerbated by the Plan Change. The Plan Change is not expected to generate a significant quantum of traffic in comparison with its existing local network traffic levels. This is further elaborated in Section 8, Traffic Effects. Thus, it is not expected that the Plan Change will have a significant difference on the road safety of the local road network.

6.5 Future Accessibility & Recommendations

While this Plan Change proposes development on the western side of Highbrook Drive that will be generally distant from other surrounding residential areas such as in Ōtāhuhu and Ōtara, it is envisaged that further development of the industrial area on the eastern side of Highbrook Drive will occur over the short-term future that will positively affect transport patterns and movements to / from the development site. Recreational and commercial activities may be included in the industrial developments including a recreational path along the northern boundary of the site providing an enhanced active transport connection to the east toward the Ōtara Town Centre.

As previously referenced, it is recommended that public transportation and active mode provisions are developed as part of the Plan Change. This includes the addition of a bus stop on Route 351, either side of the signalised intersection that provides entry to the Plan Change area. These bus stops should be of high amenity value and constructed with safe, efficient design in mind, as well as the TDM guidelines. This will provide a regular connection between the site and Ōtāhuhu on the western end, and Botany on the eastern. The Southern and Eastern train lines are available from Ōtāhuhu station, in addition various bus services. A shuttle service is also recommended to be included in future transport plans and provisions associated with the development within the Plan Change area to further encourage active transport uptake. Details of the service should be determined in coordination with AT and other stakeholders including future residents as to the timings and destinations of the shuttle as to provide a service that would encourage the most public transportation uptake.

In addition to these changes, the signalised intersection that will make up the access to the proposed development on the Plan Change area will include a safe crossing for pedestrians and cyclists across all four approaches (assuming an entry to the future industrial development opposite the Plan Change area). This will allow for safe crossing between the residential site and industrial site. Furthermore, it is suggested that improvements are made to the pedestrian protections at the Highbrook Drive, SH1, and Hellabys Road roundabout, including crash barriers, better pedestrian safety and the island on the existing unprotected crossing, and wayfinding improvements.

The Applicant is committed to working further with the AT and other stakeholders on the integration of the proposed development into the active modes and public transportation networks. A map of recommendations within the existing transportation environment (including local attractors) can be seen in **Figure 7**:

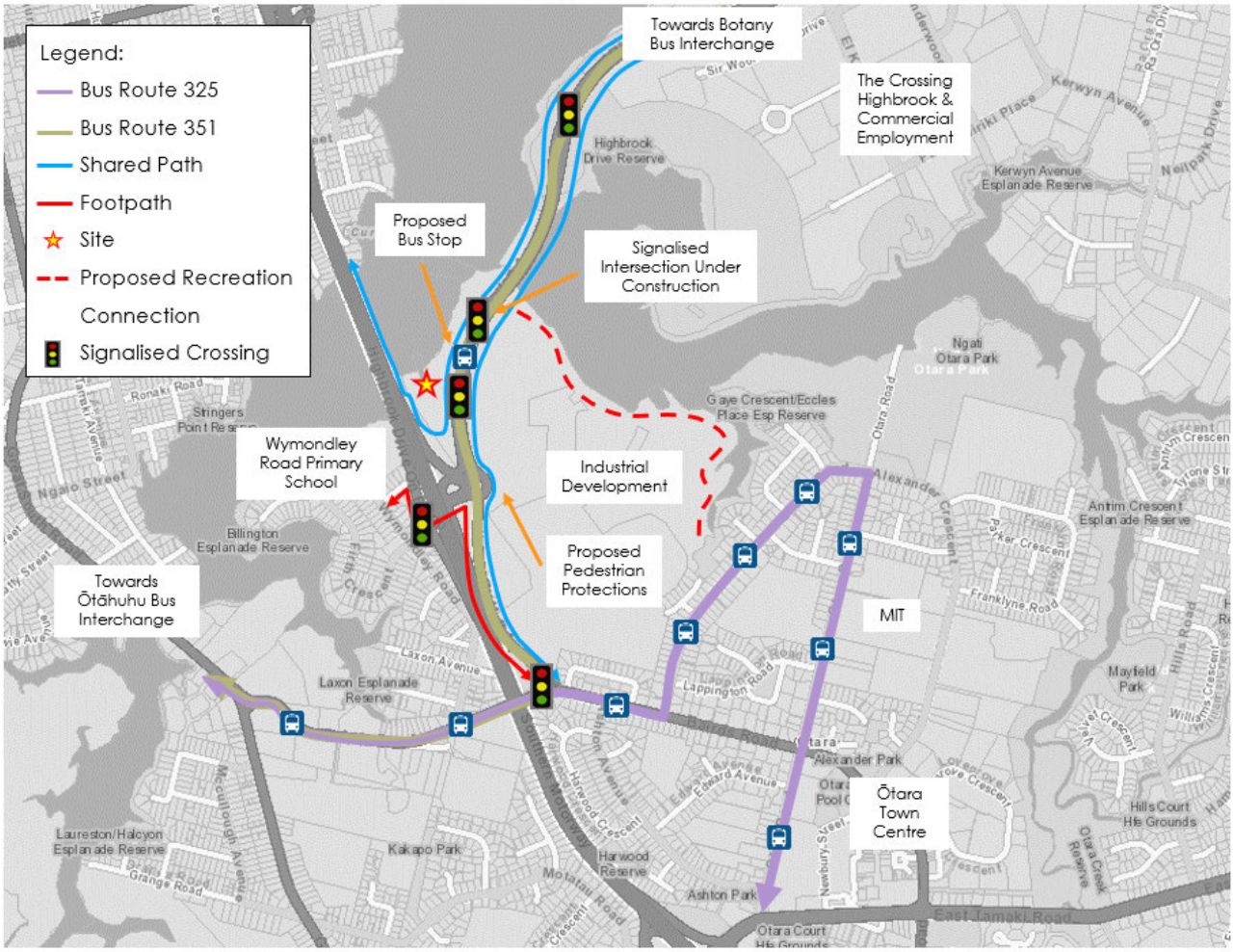

Figure 7: Active Modes and Public Transportation Map

The Applicant is currently developing plans for the industrial employment zone opposite the Plan Change area. As mentioned previously, it is considered and highly beneficial for those plans to include recreational and commercial areas that will be accessible from the proposed residential activity within the Plan Change land.

Given the site's waterfront location, there are also potential future opportunities for water transport that could be considered in the future.

7 Traffic Effects

7.1 Modelling Methodology

7.1.1 Previous Assessments of the Site

Stantec previously prepared a Transportation Assessment report in November 2019 for a proposed light industrial development of the Applicant's overall site (at 8 Sparky Road) including the Plan Change area (**2019 TA report).** As part of that assessment, Stantec developed a network traffic model using Aimsun[6] microsimulation software package in 2016 to investigate the potential traffic effects. The model was calibrated and validated to 2016 traffic conditions and included 2022 and 2028 forecast years. Details about the development of the model can be found in Section 7 of the 2019 TA report.

The Aimsun model has been used to assist with the assessment of the traffic effects of the proposed Plan Change. Microsimulation modelling allows for the interaction of individual vehicles to be captured and provides a visual tool to assess the behaviour of the network.

Figure 8 illustrates the extent of the Aimsun model.

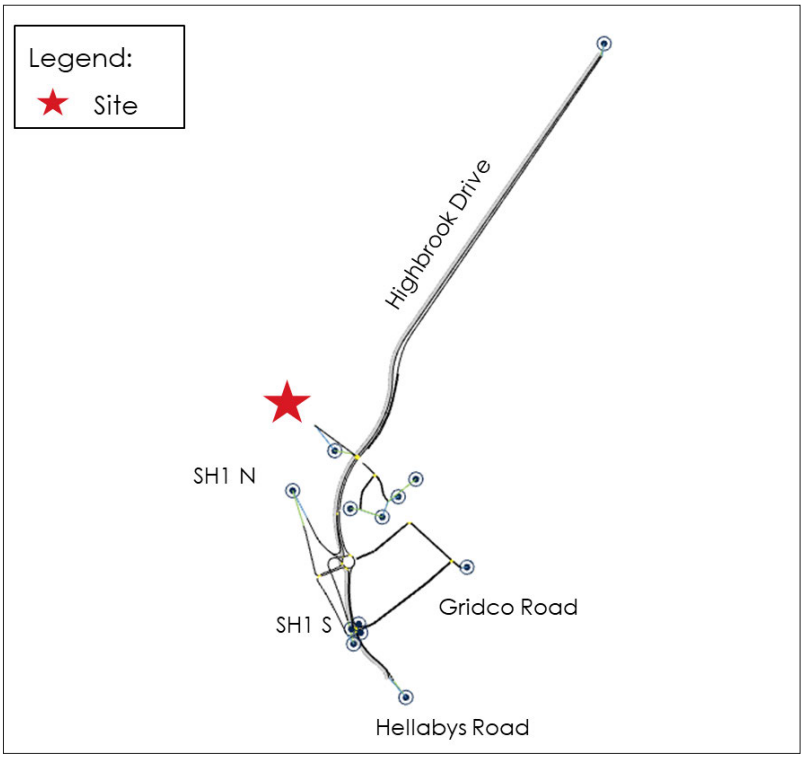

Figure 8: Model Extent

As illustrated, the model extent principally comprises Highbrook Drive to the east, Hellabys Road to the south and SH1 to the west.

Morning and afternoon peak period models have been developed to represent the existing operation of the network. These models then formed a testing platform to evaluate the effect of the proposed development.

The model was developed for a typical weekday for the following peak periods based on traffic count data:

- AM Model period from 6:45am to 8:45am with a peak hour of 7:15 am to 8:15 am.
- PM Model period from 4pm to 6pm with a peak hour of 4.30 pm to 5.30 pm.

[6] Advanced Interactive Microscopic Simulator for Urban and Non-Urban Networks – Siemens

7.1.2 Modelling Approach

To consider the impact of the proposed Plan Change on the surrounding road network, consideration will be given to the traffic impacts of the Plan Change development in comparison to a baseline scenario in which the site is developed with light industry, as per the current zoning.

The site is currently zoned Business – Light Industrial and could therefore generate a baseline level of traffic, irrespective of the Plan Change. Euroclass on behalf of the Applicant have identified approximately 18,000 sqm of light industrial activity could be developed on the Plan Change area (i.e., western side of Highbrook Drive) and approximately 90,000sqm on the eastern side of Highbrook Drive. The developable area excludes areas such as car parking, manoeuvring areas, landscaping and stormwater management.

The Plan Change anticipates up to 200 houses within the proposed THAB zoning on the western side of Highbrook Drive whilst maintaining the Business – Light Industrial Zoning on the eastern side of the site. The site is planned to be developed by 2028 and therefore a 2028 Aimsun model has been used to investigate the traffic effects of the Plan Change.

The following two scenarios have been modelled:

- Permitted Baseline scenario (18,000sqm of industrial activity on the western side and 90,000sqm on the eastern side)
- Development Scenario (200 houses on the western side and 90,000sqm of industrial activity on eastern side)

7.2 Trip Generation

The expected traffic generation of the activities at the site has been estimated using the Transport for New South Wales' (formerly the Roads and Maritime Services') Guide to Traffic Generating Developments (**TfNSW Guide**).

The TfNSW Guide provides peak hour traffic generation rates for small medium density residential units (up to two bedrooms) and larger units (three or more bedrooms). The trip generation rates for the smaller residential dwellings are 4-5vpd/dwelling daily and 0.4-0.5vph/dwelling in the weekday peak hour. For the larger units, trip generation rates are 5-6.5vpd/dwelling daily and 0.5-0.65vph/dwelling in the weekday peak hours. A trip generation rate of 0.65vph/dwelling was adopted for the residential portion of the development given the constrained nature of the site.

Using the above rates, the conceptual development of up to 200 houses within the Plan Change's THAB zoning sought might be expected to generate up to approximately 130vph (inclusive of inbound and outbound movements) during the weekday peak hours.

The 2019 TA report adopted a peak hour trip generation rate of 0.5vph per 100sqm of light industrial activity and a daily trip generation rate of 4.0vpd per 100sqm. The derivation of these rates is covered in Section 6.1 of the 2019 TA report and takes into account the warehousing nature of the industrial activity.

Table 3 compares the expected trip generation for the Plan Change area with the baseline level of traffic expected for a light industrial site.

Table 3: Trip Generation Summary

Scenario	Size		Trip Generation		
	Eastern Side	Western Side	Eastern Side	Western Side	Total
Baseline Scenario	90,000sqm industrial	18,000sqm industrial	450	90	540
Development Scenario	90,000sqm industrial	200 houses	450	130	580

As shown above, the total increase in traffic due to the Plan Change is therefore approximately 40vph in the peak hour.

7.3 Trip Distribution

The Institute of Transportation Engineers Trip Generation manual (**ITE Manual**) recommends a 26% / 74% inbound and outbound split for multi-family housing (high rise) in the morning peak hour and a 60% / 40% inbound and outbound split in the evening peak hour.

The profile of the development traffic across the full model period has been determined based on survey data collected by Stantec for similar activity types across Auckland.

Table 4 presents the peak hour factors used for the morning and evening peak hour for each activity type.

Table 4: Peak Hour Conversion Factors

Activity	AM Peak (1hr to 2hr)	PM Peak (1hr to 2hr)
Residential	1.7	1.8
Industrial	1.9	1.7

The development traffic has been distributed throughout the wider transport network based on the 2018 census data for the surrounding residential areas. There are four main access points to the wider network as follows:

- Highbrook Drive;
- Hellabys Road;
- State Highway North; and
- State Highway South

Figure 9 summarises the outbound traffic distribution for Grange, Ōtara West and Dingwall to these external locations.

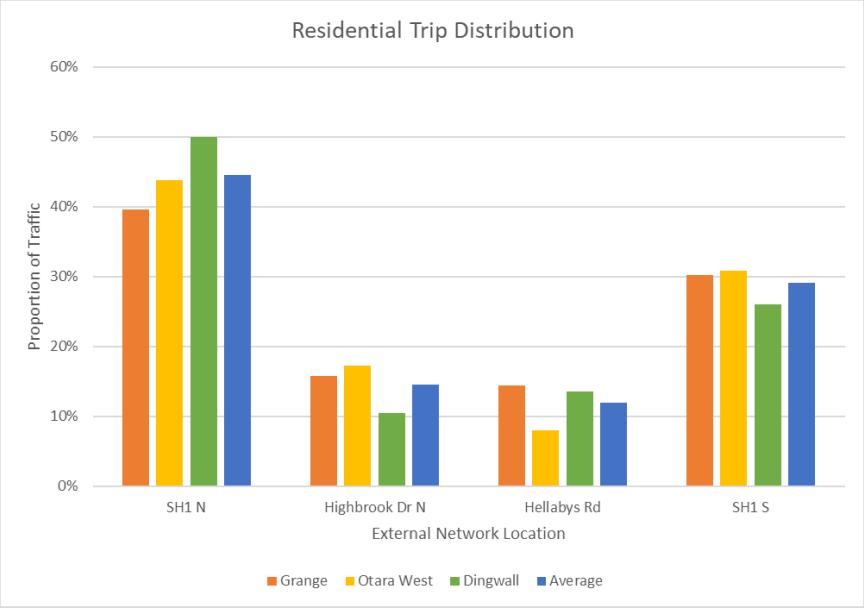

Figure 9: Outbound Trip Distribution based on 2018 Census Data

The average of the three surrounding areas trip distributions has been adopted. **Table 5** summarises the distribution of the development traffic through the surrounding road network.

Table 5: Residential Traffic Distribution

External Location	AM Peak (vph)			PM Peak (vph)		
	Inbound	Outbound	Total	Inbound	Outbound	Total
SH1 N	15	43	58	35	23	58
Highbrook Dr	10	28	38	23	15	38
Hellabys Rd	5	14	19	11	8	19
SH1 S	4	12	16	9	6	16
Total	**34**	**96**	**130**	**78**	**52**	**130**

With consideration for the baseline scenario, the potential industrial activity has been distributed to the wider network as per the assumptions outlined in section 6.2 of the 2019 TA report.

7.3.1 2019 Recalibration

Due to recent COVID-19 restrictions and the impact on travel patterns, updated traffic surveys could not be undertaken. As agreed with Auckland Transport and Waka Kotahi, the model has instead been recalibrated to August 2019 conditions using available historical traffic count data.

The following traffic count data has been collated to update the model:

- SCATS[7] count data at the following signalised intersections:
  - Midblock pedestrian crossing at Highbrook Drive approximately 210m north of Highbrook Drive interchange roundabout
  - Highbrook Drive / El Kobar Drive intersection
  - Hellabys Road / Bairds Road intersection
- TMS count data on the State Highway 1 (**SH1**) northbound on and off-ramp
- TMS count data on the SH1 southbound on and off-ramp

A similar turning proportion at the Highbrook Drive / SH1 roundabout as observed in the 2016 surveys has been assumed.

The estimated 2019 traffic counts for the morning and evening peak hours are illustrated in **Figure 10** and **Figure 11.**

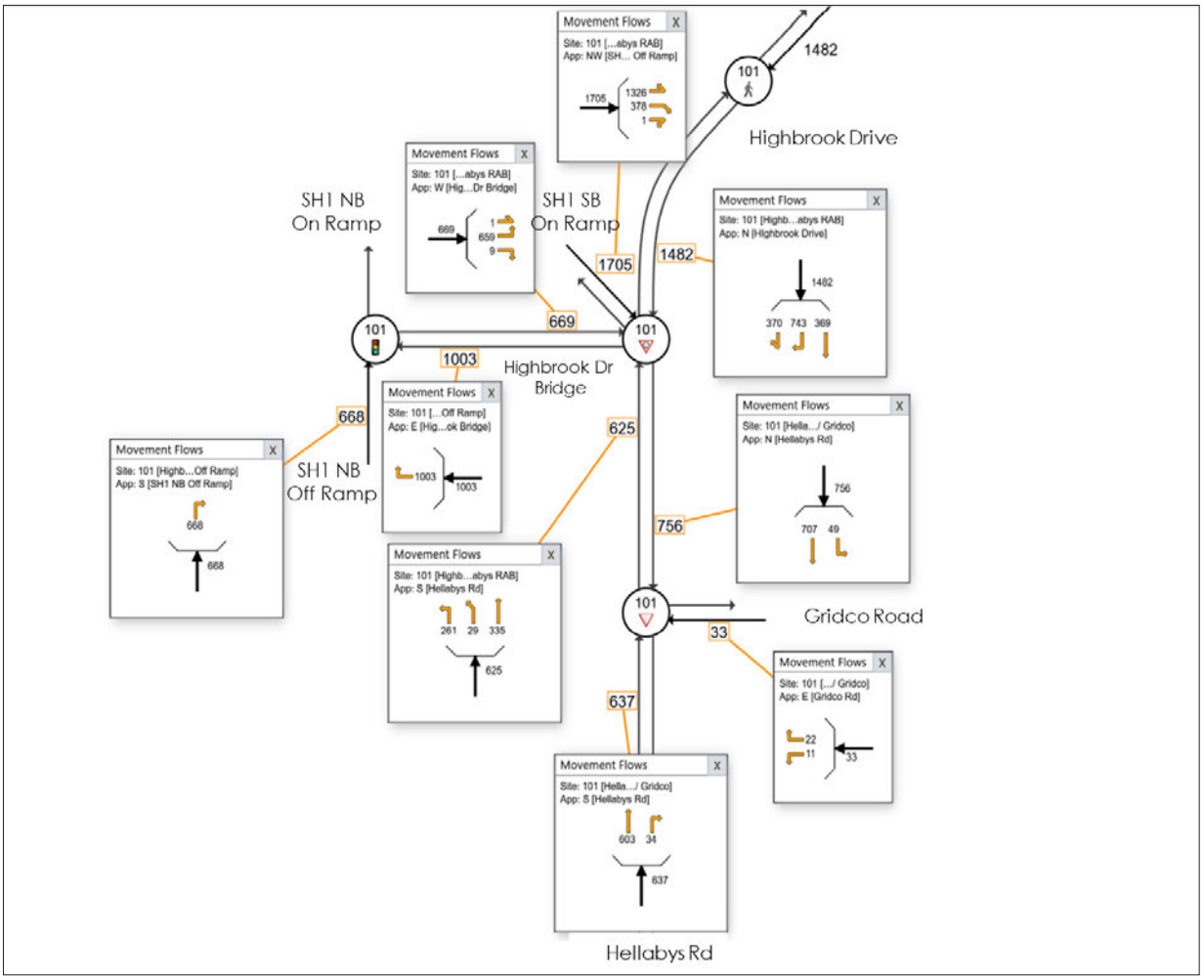

Figure 10: 2019 AM Estimated Peak Hour Volumes

[7] SCATS is the "*Sydney Coordinated Adaptive Traffic System*", which is the software that is used in Auckland to coordinate the operation of traffic signal intersections.

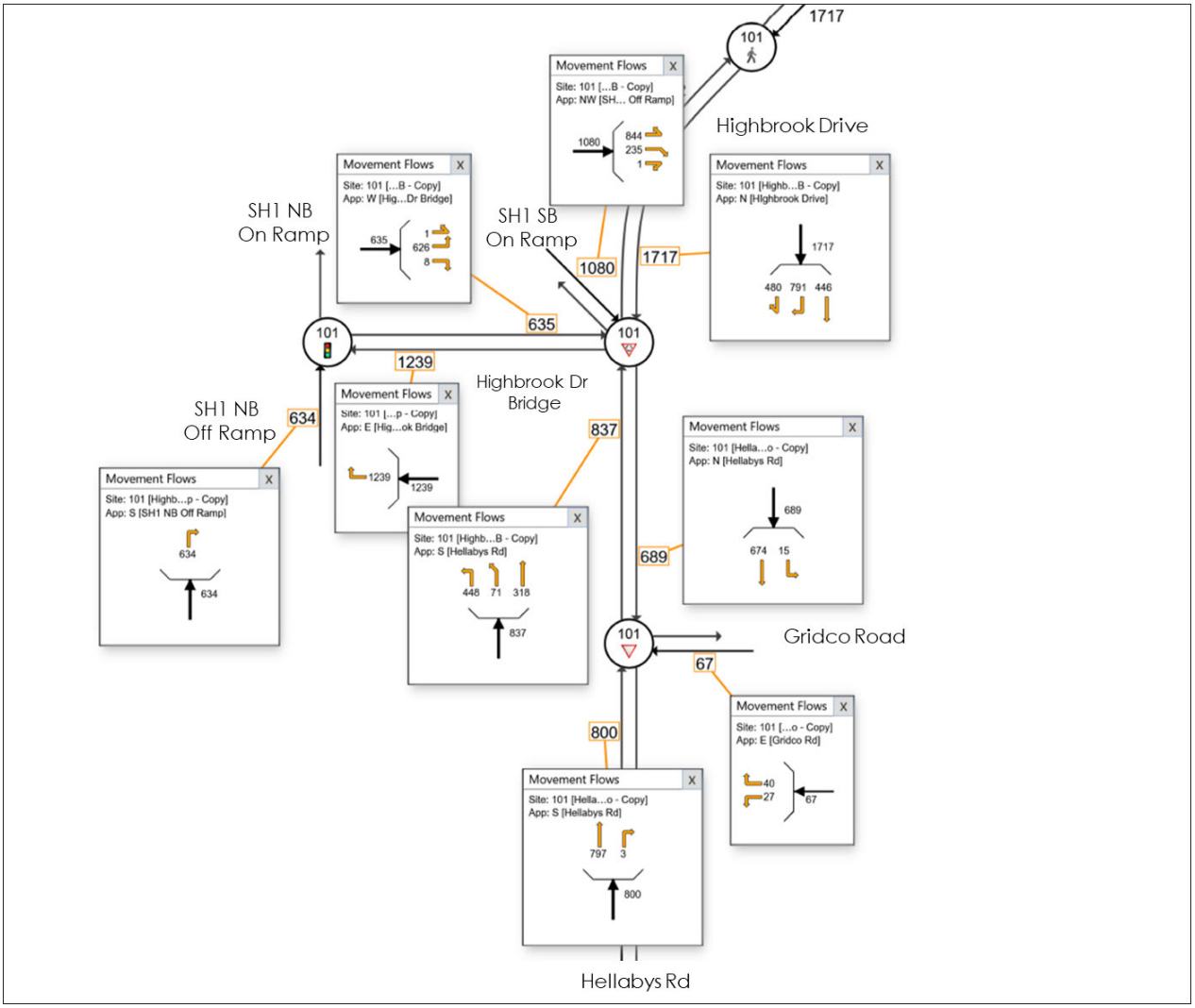

Figure 11: 2019 PM Estimated Peak Hour Volumes

7.3.2 2028 Forecast

The 2028 forecast has also been reviewed in light of the latest 2019 traffic count data.

As discussed within the 2019 TA report, the 2028 model was developed based on future traffic volumes from the MSM model. Outputs from the MSM model were provided by Auckland Forecasting Centre (**AFC**) in July 2019 for 2016 and 2028. The data showed that the Highbrook Drive and SH1 is already congested and unlikely to experience significant growth, although Hellabys Road traffic could be expected to increase by around 10 to 15%.

Table 6 and **Table 7** presents the comparison between 2016 and 2028 on the key links in the network from MSM and the percentage growth between the two years.

Table 6: AM Peak Period Forecasted Growth between 2016 and 2028 from MSM – 2hr Volumes

	Highbrook Drive		Hellabys Road		SH1 North		SH1 South	
	NB	SB	NB	SB	NB Off Ramp	SB On Ramp	NB Off Ramp	SB On Ramp
MSM 2016 Volumes	4,232	2,722	1,113	1,319	1,906	3,032	1,237	647
MSM 2028 Volumes	4,183	2,817	1,440	1,459	1,926	2,850	1,260	799

	Highbrook Drive		Hellabys Road		SH1 North		SH1 South	
	NB	SB	NB	SB	NB Off Ramp	SB On Ramp	NB Off Ramp	SB On Ramp
% Growth between 2016 and 2028	-1%	3%	29%	11%	1%	-6%	2%	23%
% Growth between 2019 and 2028	-1%	3%	22%	8%	1%	-5%	1%	18%

Table 7: PM Peak Period Forecasted Growth between 2016 and 2028 from MSM – 2hr Volumes

	Highbrook Drive		Hellabys Road		SH1 North		SH1 South	
	NB	SB	NB	SB	NB Off Ramp	SB On Ramp	NB Off Ramp	SB On Ramp
MSM 2016 Volumes	3,614	3,794	894	1,801	1,886	2,590	1,118	1,095
MSM 2028 Volumes	3,956	3,639	1,093	2,051	1,829	2,610	1,374	881
% Growth between 2016 and 2028	9%	-4%	22%	14%	-3%	1%	23%	-20%
% Growth between 2019 and 2028	7%	-3%	17%	10%	-2%	1%	17%	-15%

A linear growth rate between 2016 and 2028 has been assumed and interpolated to understand the expected growth between 2019 and 2028. These growth factors have been applied to the latest 2019 traffic count data to develop a 2020 model.

These models then formed a testing platform to evaluate the effect of the proposed development.

7.4 Modelling Results

7.4.1 Intersection performance

The morning and evening peak hour comparison for each of the key intersections is summarised in **Table 8 and 9** respectively. More detailed performance outputs for individual turning movements have been provided in **Appendix A.**

Table 8: Modelling Results - Morning Peak Hour

Intersection	Approach	Baseline		With Development	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SH1 SB Off-Ramp / Highbrook Drive / Hellabys Road (roundabout)	SH1 SB Off Ramp	25	C	25	C
	Highbrook Drive	81	F	106	F
	Hellabys Road	29	C	36	D
	Highbrook Drive Bridge	55	D	64	E

Intersection	Approach	Baseline		With Development	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SH1 NB On-Ramp / Highbrook Drive Bridge (signals)	SH1 NB Off Ramp	26	C	49	D
	Highbrook Drive Bridge	14	B	16	B
Gridco Road / Hellabys Road (priority)	Hellabys Road (S)	3	A	3	A
	Gridco Rd	162	F	150	F
	Hellabys Rd (N)	3	A	3	A
Highbrook Drive / Site Access (signals)	Industrial Access	51	D	55	E
	Highbrook Drive (NE)	18	B	47	D
	Plan Change Access	57	E	55	E
	Highbrook Drive (SW)	23	C	39	D

Table 9: Modelling Results for Evening Peak Hour

Intersection	Approach	Baseline		With Development	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SH1 SB Off-Ramp / Highbrook Drive / Hellabys Road (roundabout)	SH1 SB Off Ramp	5	A	4	A
	Highbrook Drive	61	E	68	E
	Hellabys Road	132	F	175	F
	Highbrook Drive Bridge	27	C	27	C
SH1 NB On-Ramp / Highbrook Drive Bridge (signals)	SH1 NB Off Ramp	28	C	28	C
	Highbrook Drive Bridge	51	D	55	E
Gridco Road / Hellabys Road (priority)	Hellabys Road (S)	44	E	67	F
	Gridco Rd	>1000s[8]	F	>1000s	F
	Hellabys Rd (N)	3	A	3	A
Highbrook Drive / Site Access (signals)	Industrial Access	57	E	55	D
	Highbrook Drive (NE)	21	C	23	C
	Plan Change Access	53	D	51	D
	Highbrook Drive (SW)	15	B	15	B

The results show that the surrounding Highbrook Drive and associated parts of the network is congested in both the baseline and development scenario with significant delays across all intersections modelled. At all intersections in both the AM and PM peak, the development scenario only has a marginal increase (acknowledging the congested network)

[8] Full delay cannot be captured due to off network queueing

and, in some cases, a decrease in delay from the baseline scenario as a result of some redistribution of traffic movements and reallocation of queueing extents between intersections.

In the AM peak, the largest increase in delay is along the Highbrook Drive northern approach to the SH1 SB Off-Ramp / Highbrook Drive / Hellabys Road roundabout. The increase is 25 seconds of delay which is not significant when considering the congested network. In the PM peak, the largest increase in delay of 43 seconds, is expected at the southern approach of the SH1 SB Off-Ramp / Highbrook Drive / Hellabys Road roundabout. Again, this is not significant for what is an already congested area, with this approach currently operating at LOS F.

In the peak hours, there is significant delay for vehicles exiting Gridco Road onto Hellabys Road, with minimal available gaps in Hellabys Road traffic, resulting in Gridco Road motorists likely having to wait for a courtesy gap to exit the intersection. This is only affecting approximately 150 vehicles in a peak hour, of which, this site is also owned by Euroclass. It is anticipated that this intersection will be upgraded to signals as the industrial activity on the eastern side of Highbrook Road is intensified. This will be considered by a separate resource consent. It should also be noted that a 40%/60% split of trip distribution between Highbrook Road to the north, and Gridco Road to the west, has been assumed for the industrial development. The internal layout is still being determined and therefore there could be less traffic using Gridco Road and more using the Highbrook Road signalised access.

7.4.2 Network Queuing Assessment

To consider the impact of the development on the wider road network, queuing analysis has also been undertaken to review the queues within the network during the AM and PM peaks. A review of the peak queue length within a 15-minute period over the 2-hour AM and PM peak was undertaken to assess the SH1 southbound off ramp queue, the SH1 northbound off ramp queue, and the Highbrook Drive southbound northern approach at the Highbrook Drive/SH1 offramp/ Hellabys Road intersection.

A representation of the queues that are being assessed in the form of a Queue Length Diagram can be seen in **Figure 12.**

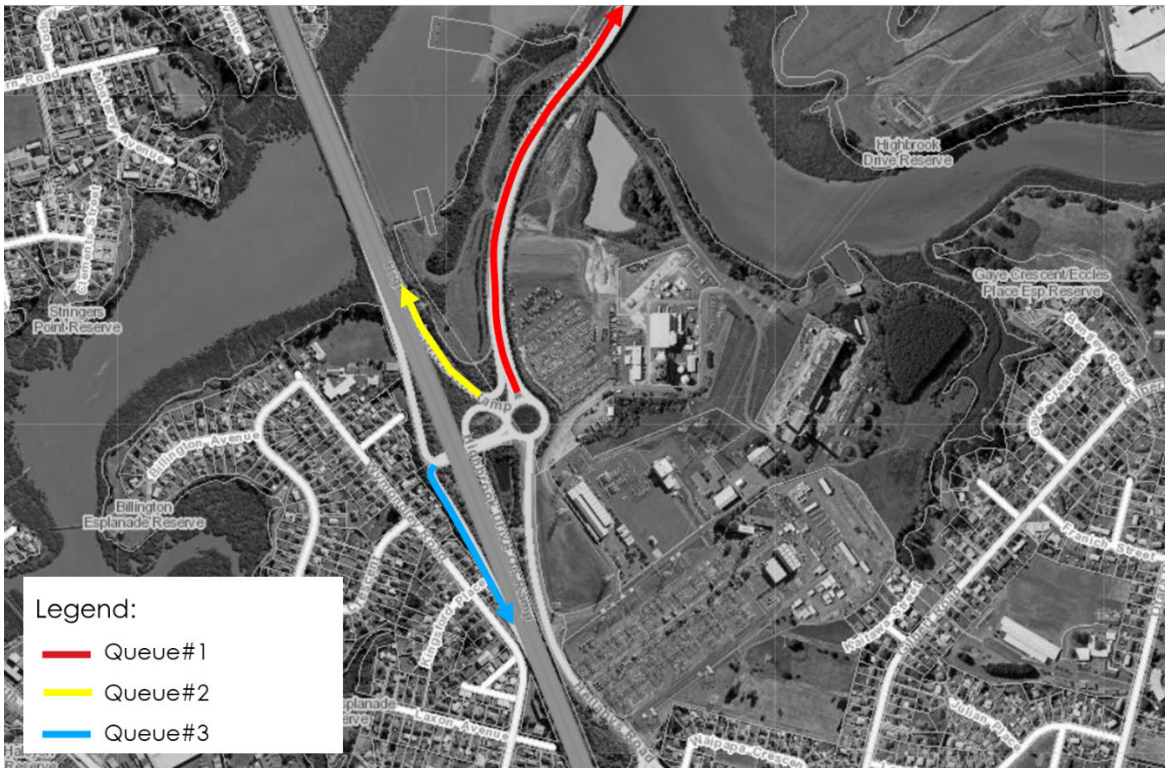

Figure 12: Queue Assessment Location

Note that **Figure 12** is only representative of the location of the queues, not of their respective modelled lengths. The queue length modelling results can be seen for each intersection across different modelled intervals in **Figure 9** to **Figure 13**. It is noted that the queue length within the site was found not to go beyond approximately 50 m, or about 6 vehicles. Though the design of any development on the site has not been finalised, this could be more than easily accommodated for.

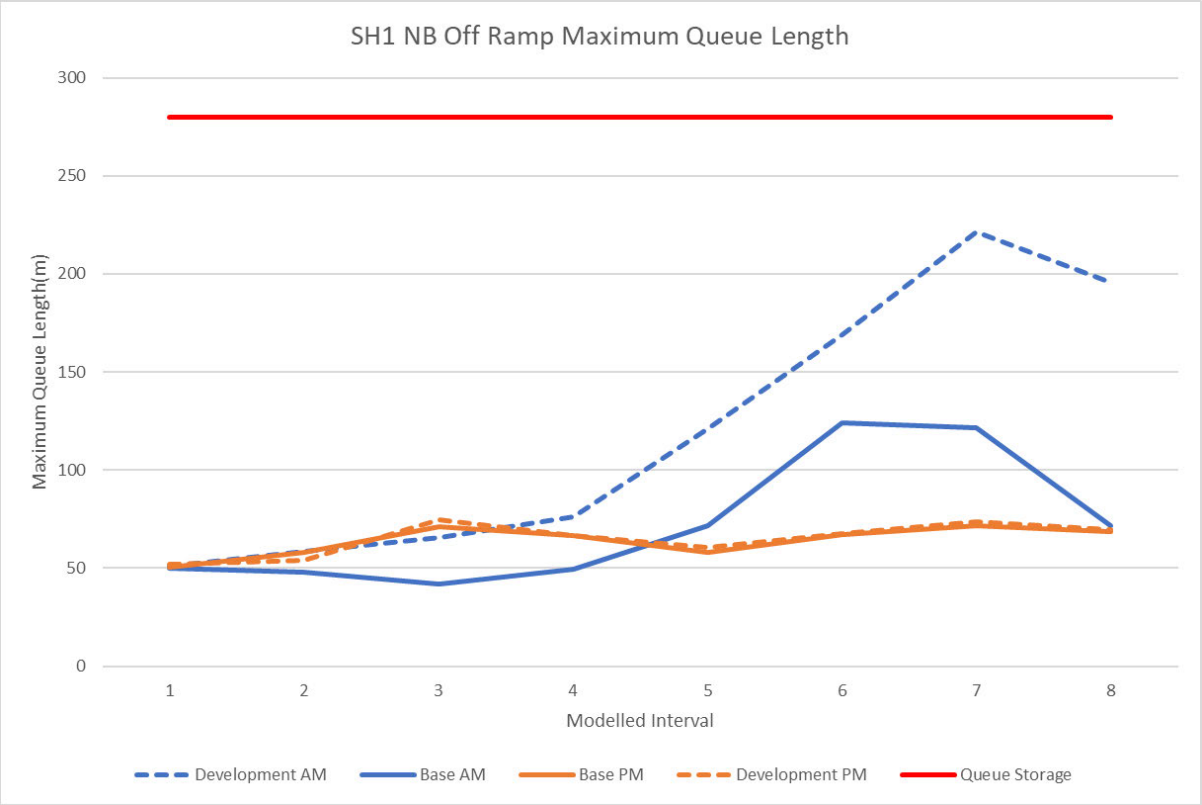

Figure 13: SH1 Northbound Off-Ramp Maximum Queue Length

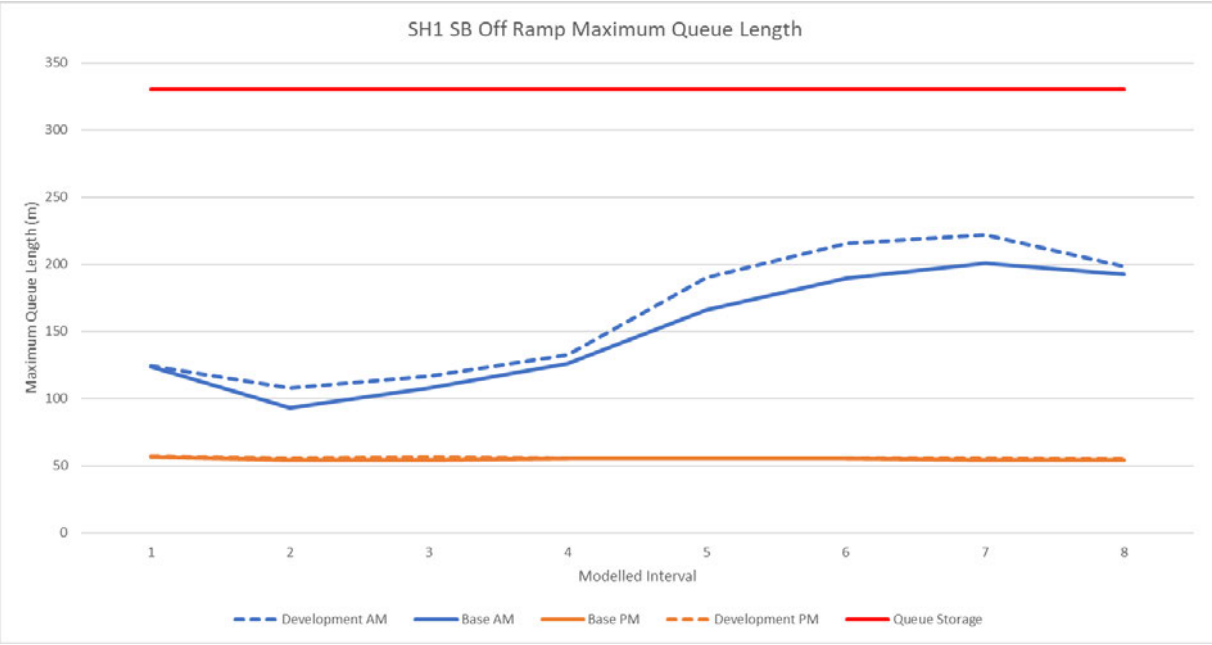

Figure 14: SH1 Southbound Off-Ramp Maximum Queue Length

Whilst modelled queue lengths are generally increased by the development, these increases are minimal when compared to the pre-existing queue lengths. Additionally, it is noted that the maximum modelled queue lengths shown above are well within the lengths of the off-ramp at 330m for the northbound off-ramp and 250m for the southbound off-ramp.

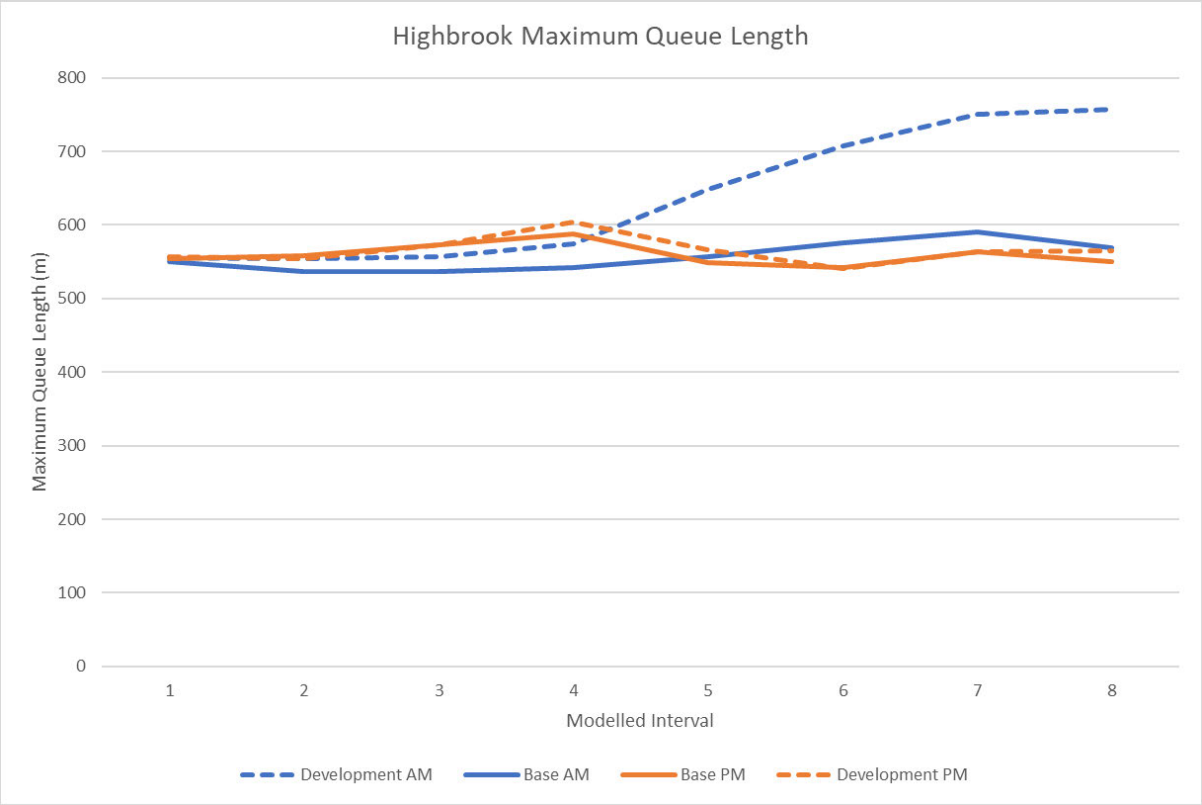

Figure 15: Highbrook Drive Maximum Queue Length

It is seen from the results shown in **Figure 15** that the peak period has significant congestion and long queues at the northern approach to the Highbrook Drive / SH1 / Hellabys Road intersection. The queues in both the AM and PM peak will extend well beyond the proposed signalised site access intersection. Given the existing traffic environment regularly results in queues extending back to the location of the signals on Highbrook Drive and beyond, the results show that the development traffic does not have a significant impact on the queue length beyond the baseline scenario.

8 Integration with Transport Policy

8.1 Government Policy Statement on Land Transport

The Government Policy Statement (**GPS**) on Land Transport sets out the Government's desired outcomes and priorities for the land transport sector. It describes what the Government expects to achieve through the National Land Transport Fund and the manner in which funding is allocated to upgrade and maintain the land transport network. The GPS was released in September 2020 and took effect from 1 July 2021. The GPS provides strategic direction for a 10-year period until 2030/2031 to improve the performance of the land transport system. The GPS has five transport outcomes to achieve, and summarises the objectives of these outcomes as follows:

(i) Inclusive access – enabling all people to participate in society through access to social and economic opportunities;

(ii) Healthy and safe people – protecting people from transport-related injuries and harmful pollution, and making active travel an attractive option;

(iii) Environmental sustainability – transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality;

(iv) Resilience and security – minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events; and

(v) Economic prosperity – supporting economic activity via local, regional, and international connections, with efficient movements of people and products

The GPS outlines four strategic priorities for land transport investment to best contribute to improving our communities' wellbeing and livability, which are described below:

(i) Safety – developing a transport system where no-one is killed or seriously injured;

(ii) Better travel options – providing people with better transport options to access social and economic opportunities;

(iii) Climate change – developing a low carbon transport system that supports emissions reductions, while improving safety and inclusive access; and

(iv) Improving freight connections – for economic development.

The proposed development involves changing the zoning from Business - Light Industrial into THAB in order to provide a variety of housing arrangements and accompanying facilities. The expected on-site facilities are likely to include a café, dairy, and shared office workspace. This has positive, inclusive of health and environmental benefits and is likely to enable improved accessibility for all age groups (young and old) via an internal and external walkway linkages. The signalised four-arm intersection at the entry to the site with pedestrian crossings on all four approaches will insure safe active mode access to the proposed industrial facility redevelopments across the road.

The anticipated provision of on-site facilities will encourage local business use and working from home, given their proximity to the development's dwellings. This encourages economic prosperity and aligns with the GPS.

The rezoning will encourage increased public transport uptake via a recommended additional bus stops on Route 351 on Highbrook Drive near the development access. Additionally, private transport/shuttles are recommended to be provided for as part of the future residential development phases to provide direct access to local transportation hubs such as the Middlemore and Ōtāhuhu train stations, organized in conjunction with future resident stakeholders and AT . This is seen as a resilient approach as it places an emphasis on public transport rather than relying solely on the roading network.

It is, therefore, demonstrated that the proposed project in Highbrook integrates very well with the strategic priorities and the themes outlined in the GPS.

8.2 National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development 2020 (**NPSUD**) sets out the Government's desired objectives and policies for urban developments. The NPSUD was released in July 2020, and came into effect from August 2020. The objectives if the NPSUD are outline below:

Objective 1: New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.

Objective 2: Planning decisions improve housing affordability by supporting competitive land and development markets.

Objective 3: Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:

(a) the area is in or near a centre zone or other area with many employment opportunities
(b) the area is well-serviced by existing or planned public transport
(c) there is high demand for housing or for business land in the area, relative to other areas within the urban environment.

Objective 4: New Zealand's urban environments, including their amenity values, develop and change over time in response to the diverse and changing needs of people, communities, and future generations.

Objective 5: Planning decisions relating to urban environments, and FDSs, take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Objective 6: Local authority decisions on urban development that affect urban environments are:

(a) integrated with infrastructure planning and funding decisions; and
(b) strategic over the medium term and long term; and
(c) responsive, particularly in relation to proposals that would supply significant development capacity.

Objective 7: Local authorities have robust and frequently updated information about their urban environments and use it to inform planning decisions.

Objective 8: New Zealand's urban environments:

(a) support reductions in greenhouse gas emissions; and
(b) are resilient to the current and future effects of climate change

Though the aforementioned objectives are largely not specifically transportation related, they will heavily impact the design of the Plan Change area for residential purposes, which in turn will influence the transportation effects of the site. Outlined in Objective 2, the NPSUD requires regional policy statements and district plans enable more people to be serviced by public transport. Public transport integration of the site is of the utmost importance to the client and the development's integration into the local public transportation network is a cornerstone of its transportation design. Its proximity to current public transportation services will not only be directly extended through additional stops, but by that of private development shuttles to nearby public transportation hubs. The client is willing to work closely with the relevant local governmental bodies to insure the development is cohesive in this regard. This preference for public transportation solutions to any possible transportation issues raised by the development are further relevant to Objective 8, supporting reduced greenhouse gas emissions through encouragement more efficient transportation modes.

8.3 Auckland Plan 2050

The Auckland Plan is Auckland Council's 30-year strategy to ensure Auckland grows in a way that will meet the opportunities and challenges of the future. Initially produced in 2012, a new plan was released in June 2018. Since the original Plan was released, the Auckland Unitary Plan has been introduced and several significant infrastructure developments have been completed. The Auckland Plan shows how Auckland will prepare for an expected population increase of 39% by 2043, and the key challenges Auckland faces in dealing with this population growth. Other key challenges identified are sharing prosperity with all Aucklanders and reducing environmental degradation.

The Auckland Plan is comprised of six outcomes where significant progress is targeted, one of which addresses transport and access. The Auckland Plan summarises this outcome as "Aucklanders will be able to get to where they want to go more easily, safely and sustainably."

The transport and access outcomes outline three directions:

(i) Better connect people, places, goods and services;
(ii) Increase genuine travel choices for a healthy, vibrant and equitable Auckland; and
(iii) Maximise safety and environmental protection.

The Auckland Plan also includes seven focus areas for the transport and access outcome:

(i) Make better use of existing transport networks;
(ii) Target new transport investment to the most significant challenges;
(iii) Maximise the benefits from transport technology;

(iv) Make walking, cycling and public transport preferred choices for many more Aucklanders;

(v) Better integrate land use and transport decisions;

(vi) Move to a safe transport network, free from death and serious injury; and

(vii) Develop a sustainable and resilient transport system.

The future development of dwellings facilitated by the Plan Change will provide an opportunity for the public transport network to be expanded and further developed, to effectively serve the proposed urbanization of the site. The anticipated development sets up a framework and support for an integrated transport system to be created with additions to the existing bus services and new shuttle services, which will encourage people to be connected with places, goods and services. The expected facilitation of on-site services within the future residential development will improve the attractiveness of the active transport modes, reducing reliance upon private vehicle trips.

Residents within the future development will also have more travel options beyond private vehicles mainly to public transport, due to the proposed additional bus stop and shuttle services expected to increase the connectivity of the Plan Change area to the external network. This demonstrates that the proposed project integrates well with the transport and access outcomes of the Auckland Plan.

8.4 Auckland Unitary Plan

The Auckland Unitary Plan, which has been operative in part since November 2016, has the following objectives with regards to transport infrastructure:

- Land use and all modes of transport are integrated in a manner that enables:
  - The benefits of an integrated transport network to be realised; and
  - The adverse effects of traffic generation on the transport network to be managed;
- An integrated public transport, walking and cycling network is provided for;
- Parking and loading support urban growth and the quality compact urban form;
- The provision of safe and efficient parking, loading and access is commensurate with the character, scale and intensity of the zone;
- Pedestrian safety and amenity along public footpaths is priorities; and
- Road / rail crossings operate safely with neighbouring land use and development.

Encouragement of public transport modes enables the adverse effects of the traffic generated by the developments to be mitigated. The addition of a signalised intersection to the site's access will provide for safe travel to the recommended additional bus stop on Highbrook Drive, and a potential shuttle service will provide safe travel to the wider public transport system. This will ultimately provide the benefits of an integrated network by providing residents with transportation choices, thereby reducing the effects of generated traffic by reducing the relative demand for private vehicle travel.

In summary, the Plan Change area is well located to a variety of transportation modes. With the additional public transport facilities proposed the development will integrate well with both the objectives of the Unitary Plan and the existing and future transportation network.

8.5 Auckland Transport Alignment Project

Given the growth challenges that Auckland is facing, and the need for some big transport decisions to deal with this, the Government and Auckland Council have agreed on the need for a collaborative approach to improving alignment on a long-term strategic approach to transport in Auckland. A new edition of the Auckland Transport Alignment Project (**ATAP**) was released in March 2021 to provide a package to develop Auckland's transport system over the next 10 years. An important part of this work is to agree an indicative investment package that guides statutory funding plans like Auckland's Region al Land Transport Plan and the National Land Transport Programme. Over the past five years, ATAP has enabled significant progress on improving transport in Auckland. The ATAP focuses on three main investment areas; operational costs (including maintenance), asset renewals, and new infrastructure. Within new infrastructure, a great emphasis has been placed on rapid transit, road network, safety, walking and cycling, bus and ferry improvements, and more.

Ultimately, ATAP aims to provide Auckland with a transport system that provides safe, reliable and sustainable access. It contains investment to be made in projects to assist growth over the next decade (2021 – 2031), while identifying future priorities beyond 2031. It recommends investment be made in short and medium-term projects to assist growth over the next decade while working to protect routes for longer-term projects.

There are no projects planned for delivery, within proximity of the Highbrook area, between 2021 and 2031.

8.6 Regional Land Transport Plan (RLTP)

The Regional Land Transport Plan (**RLTP**), prepared by Auckland Transport with Waka Kotahi and Kiwi rail, identifies the priority of several key region-wide transport projects over a ten-year period. The current RLTP was adopted in 2021 and covers the period 2021-2031. Projects outlined in the existing RLTP are outlined in ATAP.

The key transport challenges the RLTP attempts to address are climate change and the environment, safety, access to employment and social opportunities, and travel choices. The anticipated residential development in accordance with the THAB zoning sought will integrate well with the RLTP by aligning well with these strategic challenges the RLTP addresses. The integration of different land uses allows active modes and public transport to be prioritised as a transport mode. This will enhance the relative resilience of the area.

8.7 Regional Public Transport Plan (RPTP)

The Auckland Regional Public Transport Plan (**RPTP**) seeks to deliver an improved public transport network in Auckland by increasing public transport frequency along key transport corridors and simplifying ticketing to improve user experience.

The vision of the RPTP is to deliver "*An integrated, efficient and effective public transport network that offers a wider range of trips and valued by Aucklanders".* To achieve this vision, Auckland's public transport system needs to deliver:

- Services that align with future land use patterns;
- Services that meet customer needs;
- Increased passenger numbers;
- Increased public transport mode share; and
- Improved value for money.

The proposed development is not currently well served by the public transport network. The increased activity within Highbrook that will be facilitated by the THAB zoning sought will improve the economic viability of providing additional bus routes or bus stops to serve the Highbrook area. The proposed rezoning does not hinder Auckland Council and Auckland Transport from achieving the deliverables outlined in the RPTP.

9 Conclusion

This ITA has been prepared to support the Plan Change to rezone land to the west of Highbrook Drive at 8 Sparky Road from Business - Light Industry Zone to Residential – THAB Zone under the Unitary Plan. The Plan Change will enable up to approximately 200 residential dwellings on the site with an expected range of supporting land uses such as a dairy, a café and a shared office space. This ITA has considered the future transport networks and land uses within Highbrook and the surrounding areas.

Descriptions, analyses and assessments provided in the ITA has shown that the development of residential dwellings at the site, compared with the development of light industry at the site, will have acceptable impact on the surrounding road network (given the commitments to a range of non-private car travel modes and option for future residents within the THAB zoned land), which is already significantly congested. Further analysis and optimisation of the site intersection design is expected to be undertaken as part of future consent stages.

To encourage public transport use for future residents and visitors to the development, it is recommended that a bus stop, of high amenity, safety, and efficiency in design, be installed along the site frontage on Highbrook Drive. This bus stop will be serviced by Bus Route 351 which already travels along this section of Highbrook Drive, and provides connections to Ōtāhuhu Town Centre, Ōtāhuhu Train Station, the Highbrook Business Park and Botany Town Centre. It is further recommended that a shuttle service be implemented in support of future residential development within the Plan Change land to enhance the connection with nearby public transport hubs such as the Middlemore and Ōtāhuhu train stations. This should be planned and designed in consultation with the future residential community and AT representatives to maximise its efficacy in terms of timing and preferred destination.

To encourage active mode uptake from future residents traveling to local attractors, improvements will be made to the safety of the Highbrook Drive, SH1, and Hellabys Road roundabout. These will include crash barriers on the western path, safer crossing amenities such as a protected island, and better wayfinding measures. This will be complemented by the provision of pedestrian crossing phases on all four approaches of the new signalised intersection at the entry of the Plan Change area.

The development enabled by the Plan Change rezoning as sought is consistent with current government transport policies.

In summary, there is no traffic engineering and transport planning reason to preclude acceptance of the proposal.

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Appendix

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Appendix A Modelling Results

AM Modelling Results:

Baseline

Intersection	Appr & Turn	Count	Mvmt Delay	Mvmt LOS	App Delay	App LOS	Int Del	Int LOS
SH1 SB Off-Ramp / Highbrook Dr (Roundabout)	NW Left	1274	8	A	25	C	48	D
	NW Thru	500	67	E				
	NW Right	0	0	A				
	NE Left	491	84	F	81	F		
	NE Thru	689	81	F				
	NE Right	447	80	F				
	S Left	350	17	B	29	C		
	S Thru	44	39	D				
	S Right	503	37	D				
	W Left	0	0	A	55	D		
	W Thru	770	54	D				
	W Right	39	76	E				
SH1 NB On-Ramp / Highbrook Dr (Signals)	S Right	819	26	C	26	C	19	B
	E Right	1037	14	B	14	B		
Gridco / Hellabys (Priority)	S Thru	856	2	A	3	A	162	F
	S Right	39	3	A				
	E Left	11	28	D	162	F		
	E Right	44	162	F				
	N Left	140	3	A	3	A		
	N Thru	890	2	A				
Highbrook Dr / Site (Signals)	SE Left	20	54	D	51	D	21	C
	SE Thru	0	0	A				
	SE Right	36	50	D				
	NE Left	64	19	B	18	B		
	NE Thru	1631	18	B				
	NE Right	18	64	E				
	NW Left	11	57	E	57	E		
	NW Thru	0	0	A				
	NW Right	6	57	E				
	SW Left	57	19	B	23	C		
	SW Thru	2341	19	B				
	SW Right	145	76	E				

With Development:

Intersection	Appr & Turn	Count	Mvmt Delay	Mvmt LOS	App Delay	App LOS	Int Del	Int LOS
SH1 SB Off-Ramp / Highbrook Dr (Roundabout)	NW Left	1266	9	A	25	C	59	E
	NW Thru	503	63	E				
	NW Right	0	0	A				
	NE Left	482	108	F	106	F		
	NE Thru	709	105	F				
	NE Right	454	105	F				
	S Left	348	20	C	36	D		
	S Thru	44	46	D				
	S Right	492	46	D				
	W Left	0	0	A	64	E		
	W Thru	749	62	E				
	W Right	39	92	F				
SH1 NB On-Ramp / Highbrook Dr (Signals)	S Right	798	49	D	49	D	30	C
	E Right	1056	16	B	16	B		
Gridco / Hellabys (Priority)	S Thru	846	3	A	3	A	150	F
	S Right	38	3	A				
	E Left	10	16	C	150	F		
	E Right	44	150	F				
	N Left	138	3	A	3	A		
	N Thru	888	2	A				
Highbrook Dr / Site (Signals)	SE Left	22	55	D	55	E	43	D
	SE Thru	0	0	A				
	SE Right	33	56	E				
	NE Left	64	47	D	47	D		
	NE Thru	1601	47	D				
	NE Right	3	103	F				
	NW Left	12	54	D	55	E		
	NW Thru	0	0	A				
	NW Right	72	55	E				
	SW Left	29	30	C	39	D		
	SW Thru	2314	35	C				
	SW Right	147	115	F				

PM Modelling Results:

Baseline:

Intersection	Appr & Turn	Count	Mvmt Delay	Mvmt LOS	App Delay	App LOS	Int Del	Int LOS
SH1 SB Off-Ramp / Highbrook Dr (Roundabout)	NW Left	832	1	A	5	A	53	D
	NW Thru	304	15	B				
	NW Right	0	0	A				
	NE Left	666	62	E	61	E		
	NE Thru	806	60	E				
	NE Right	405	61	E				
	S Left	404	160	F	132	F		
	S Thru	57	97	F				
	S Right	307	102	F				
	W Left	0	0	A	27	C		
	W Thru	734	26	C				
	W Right	17	38	D				
SH1 NB On-Ramp / Highbrook Dr (Signals)	S Right	750	28	C	28	C	42	D
	E Right	1215	51	D	51	D		
Gridco / Hellabys (Priority)	S Thru	756	44	E	44	E	1880	F
	S Right	5	35	D				
	E Left	23	1576	F	1880	F		
	E Right	52	1880	F				
	N Left	47	3	A	3	A		
	N Thru	940	2	A				
Highbrook Dr / Site (Signals)	SE Left	116	63	E	57	E	20	C
	SE Thru	0	0	A				
	SE Right	73	48	D				
	NE Left	29	24	C	21	C		
	NE Thru	1725	20	C				
	NE Right	10	72	E				
	NW Left	22	52	D	53	D		
	NW Thru	0	0	A				
	NW Right	39	54	D				
	SW Left	11	13	B	15	B		
	SW Thru	1841	14	B				
	SW Right	30	65	E				

With Development:

Intersection	Appr & Turn	Count	Mvmt Delay	Mvmt LOS	App Delay	App LOS	Int Del	Int LOS
SH1 SB Off-Ramp / Highbrook Dr (Roundabout)	NW Left	861	1	A	4	A	62	E
	NW Thru	303	15	B				
	NW Right	0	0	A				
	NE Left	651	69	E	68	E		
	NE Thru	817	68	E				
	NE Right	413	68	E				
	S Left	381	210	F	175	F		
	S Thru	54	134	F				
	S Right	300	137	F				
	W Left	0	0	A	27	C		
	W Thru	758	27	C				
	W Right	16	39	D				
SH1 NB On-Ramp / Highbrook Dr (Signals)	S Right	767	28	C	28	C	45	D
	E Right	1209	55	E	55	E		
Gridco / Hellabys (Priority)	S Thru	743	67	F	67	F	1645	F
	S Right	5	60	F				
	E Left	19	1216	F	1645	F		
	E Right	42	1645	F				
	N Left	46	3	A	3	A		
	N Thru	926	2	A				
Highbrook Dr / Site (Signals)	SE Left	118	60	E	55	D	21	C
	SE Thru	0	0	A				
	SE Right	71	46	D				
	NE Left	29	24	C	23	C		
	NE Thru	1723	23	C				
	NE Right	11	72	E				
	NW Left	7	53	D	51	D		
	NW Thru	0	0	A				
	NW Right	45	50	D				
	SW Left	69	14	B	15	B		
	SW Thru	1823	14	B				
	SW Right	30	62	E				

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17 February 2022 Job No: 64872#GE eTrack No: 200040703

□ ig□□r□□□ □i□ing Limited

Att: Matt Doughney

RE: HIGHBROOK LIVING – GEOTECHNICAL APPRAISAL FOR PLAN CHANGE

1 INTRODUCTION

□ ig□□r□□□ □i□ing Limited has engaged Babbage Consultants Ltd (Babbage) to provide a geotechnical assessment to support its Private Plan Change (PPC) Request to rezone land which forms part of the property at 8 Sparky Road Otara (the site) as high-density residential end use.

This geotechnical assessment is limited in scope to the area identified on the attached Site Plan. It is a preliminary geotechnical appraisal based on a desk study to inform the Private Plan Change Request and should be read in conjunction with the Applicability and Limitations as attached.

2 DESK STUDY

2.1 Site Description

The site is located in Otara and is bound by Highbrook Drive to the south-east, Tamaki River (estuary) to the north and the Southern Motorway to the west as shown in the site plan attached in Appendix A.

The plan change area ("the site") and surroundings are summarised below:

- The site forms part of the former Ōtāhuhu power station site.
- The site is located in the Light Industry Zone area in Ōtara. The residential area and town centre of Ōtara are to the south-east, and Highbrook Business Park is on the opposing side of Ōtara Creek to the north-east.
- The majority of the site is relatively flat at around 8mRL, with the exception of the slope from ~7mRL down to the shoreline along Tamaki River. This slope typically less than 45 degrees (1V:1H), however is locally as steep as ~56 degrees (1.5V:1H).
- There are some low points present on the site, including a pond in the northwest corner adjacent to State Highway 1 (SH1) which was used as an erosion and sediment pond during construction of Highbrook Drive and the widening of SH1.

2.2 Historic Aerial Photography

Historic aerial photography from AC Geomaps and Retrolens[i] was reviewed as part of this assessment. Key changes to land use since 1940 include:

- 1958: Southern Motorway built across Curlew Bay to the west. Largely agricultural land.
- 1967-1969: Large liquid storage tanks under construction on north of site (likely associated with old power station). Stopbank built at edge of Curlew Bay adjacent Southern Motorway. Reclamation filling between stop bank and natural waterline beginning.
- 2003-2004: Removal of the liquid storage tanks.
- 2006: Construction of Highbrook Drive and widening of Southern Motorway in progress.

2.3 Published Geology

The geological map[ii] (see Figure 1) indicates the south and centre of the site is underlain by pumiceous deposits of the Puketoka Formation (tp), described as light-grey to orange-brown, pumiceous mud, sand and gravel, with muddy peat and lignite.

The north-eastern extent of the site is indicated to be underlain by lithic tuff of the Auckland Volcanic Field (avt), being thin graded beds of grey, mud- to sand-sized fragments of comminuted, country rock (mainly sandstone, mudstone, alluvium, micaceous sand) together with basalt and basanite fragments.

A small area of reclaimed land (hf) is present in the southwest corner, adjacent to the jetty.

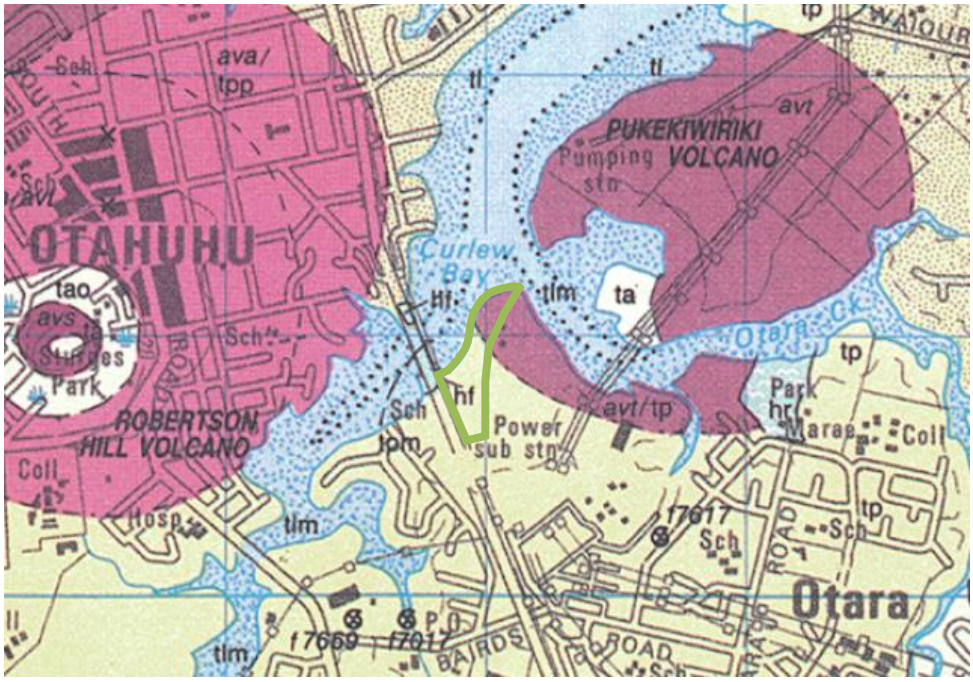

Figure 1: Excerpt of the Auckland Urban Area Geology Map (1:50,000)

2.4 Nearby Investigation Data

The NZ Geotechnical Database[iii] contains several historic investigations carried out close to the site. These included machine-drilled boreholes, Cone Penetrometer Tests (CPTs) and test pits carried out in 2003-2004 for Highbrook Drive and the Southern Motorway widening (refer NZGD site plan below in Figure 2). The borehole logs considered in this assessment are attached to this letter.

Figure 2: Available data on the NZGD (accessed 10 December 2021)

3 SUMMARY OF ANTICIPATED GROUND CONDITIONS

Based on the findings from the desk study, ground conditions are expected to comprise clay, silt and sand of the Puketoka formation, overlain in part by tuff and other AVF deposits and/or surficial fill. The Puketoka formation is anticipated to comprised mostly stiff to hard clay and silt over the top 8-15m, with some loose to dense silty sand lenses. Competent Kaawa Formation sediments are expected between 15m and 22m below ground level. The lower lying reclamation area in the north-west corner of the site appears to comprise ~1.0m of well compacted aggregate separated from the underlying alluvium by a geotextile.

4 GEOTECHNICAL CONSIDERATIONS

4.1 Seismic Hazard

4.1.1 Seismic Subsoil Class

Based on the information available, the local geology, and our knowledge of the area, we consider that the site can be categorised as a 'shallow soil site' (Subsoil Class C) in accordance with NZS1170.0:2002 and NZS1170.5:2004.

4.1.2 Liquefaction Susceptibility

With respect to the liquefaction potential of the site, the anticipated ground conditions comprise predominantly stiff to hard cohesive material for the majority of the soil profile. Thin lenses of silty sand and sandy silt may be present which are more susceptible to liquefaction, however considering the relatively low peak ground accelerations associated with the design earthquake events, and the competent cohesive material present in the upper profile acting as a non-liquefiable 'crust', surface manifestation of liquefaction if considered highly unlikely.

Accordingly, liquefaction-induced ground damage during a ULS event for Importance Level 2 structures is assessed to be in the None to Minor category as defined by the Planning and Engineering Guidance for Potentially Liquefaction Prone Land (MBIE, 2017) document, and the site designated to have a Low Liquefaction Vulnerability. During an SLS event, the risk of liquefaction-induced ground damage is considered negligible.

Further assessment of the site's liquefaction susceptibility will be required during subsequent design stages.

4.2 Slope Stability

The majority of the site is flat, and therefore not considered susceptible to slope stability issues. However, development in close proximity to the northern slopes will require further consideration. Provisionally, a Building Restriction Line (BRL) set 10m back from the slope crest is recommended. It is understood that an esplanade reserve along the riverfront will be incorporated into future development plans, which will readily accommodate the setback zone.

A Building Restriction Line does not preclude development extending beyond; however, it would likely need to be accompanied by slope stabilization works such as in-ground retaining walls to ensure minimum factors of safety against instability as defined in the Auckland Council (2003) Code of Practice for Land Development and Subdivision are achieved.

The requirement for and position of the BRL will be assessed following quantitative stability analyses during subsequent design stages.

4.3 Coastal Erosion

Wave action is not expected in the Tamaki River, and therefore the risk of erosion affecting the proposed development is considered highly unlikely. Nevertheless, the proposed esplanade reserve and any requirements for a Building Restriction Line will ensure building platforms are not detrimentally affected by coastal erosion processes.

4.4 Building Foundations

Foundation selection will largely depend on structural loads. Medium- or high-rise structures are likely to require piling. Ground conditions are anticipated to be suitable for shallow foundations for smaller buildings (standalone or terraced housing) in general accordance with NZS 3604 or NZS 4229, subject to future investigation confirming the ground bearing capacity and soil reactivity class in line with AS 2870[iv] and NZ Building Code Clause B1[v].

4.5 Earthworks

Ground conditions are expected to be suitable for cut material to be re-used as engineered fill. Further investigation and testing should be undertaken during design development to confirm material types, conditioning requirements (if any) and compaction criteria.

5 CLOSING

This assessment has been prepared for □ ig□□r□□□ □i□ing Limited to support a Private Plan Change Request. In general, the site is considered geotechnically suitable for the new proposed land use.

Further geotechnical assessment and site-specific geotechnical investigations will be required to support resource and/or building consent application. Investigation locations should focus on any retaining walls and proposed building locations once a concept design is established.

Please contact Babbage Consultants Limited with any questions relating to this assessment.

Yours sincerely

Jordan Moll
Geotechnical Engineering Manager

Babbage Consultants Ltd

Attachments: Applicability and Limitations
Site Plan
Borehole Logs (NZGD)

REFERENCES

[i] Retrolens Aerial Photography, sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0 retrieved October 2021.

[ii] Kermode, L.O. (1992): "Geology of the Auckland urban area". Scale 1:50,000. Institute of Geological & Nuclear Sciences geological map 2. 1 sheet + 63 p. IGNS Ltd: Lower Hutt.

[iii] NZ Geotechnical Database: https://www.nzgd.org.nz/, retrieved October 2021.

[iv] AS 2870:2011 "Residential Slabs and Footings", 17 January 2011. Standards Australia: Sydney.

[v] Ministry of Business, Innovation and Employment (2019): *Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B1 Structure*. Amendment 19, 28 November 2019. MBIE: Wellington.

APPLICABILITY AND LIMITATIONS

This report has been prepared solely for the benefit of □ ig□□r□□□ □i□ing Limited as our client with respect to the brief. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such party's sole risk.

Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on they should be independently verified with appropriate legal advice.

All maps, plans, and figures included in this report are indicative only and are not to be used or interpreted as engineering drafts. Do not scale any of the maps, plans or figures in this report. Any information shown here on maps, plans and figures should be independently verified on site before taking any action. Sources for map and plan compositions include LINZ Data and Map Services and local council GIS services. For further details regarding any maps, plans or figures in this report, please contact Babbage Consultants Limited.

Recommendations and opinions in this report are based on data from previous investigations undertaken by others as discussed within this report. The nature and continuity of subsoil conditions away from the boreholes are inferred; actual conditions may vary considerably from the assumed model.

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CLIENT / PROJECT

Highbrook Private Plan Change

MAP TITLE

Map No 1. Site Plan

MAP REVISIONS

15/10/2021	Initial version by TT.

Legend

- Highbrook Site Boundary
- Contours Line (RL)
  - 0.5

NOTES
Aerial Images - LINZ Basemap

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 @ A3

MAP NO.

64872#BEE02 32[01]

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH3
Hole Location: Refer to Site Plan
SHEET 1 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 791996.28 mN, 408475.40 mE
R.L. 7.89 m
DATUM
DRILL TYPE: Edson MRA260
DRILL METHOD: Rotary
DRILL FLUID: Water
HOLE STARTED: 23/09/03
HOLE FINISHED: 24/09/03
DRILLED BY: Prodrill (Cameron)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
TOPSOIL			100%	OB				7			OL	M	MD				SILT, moist, dark brown, organics, roots.
PUMICEOUS ALLUVIUM (PUKETOKA FORMATION)		26/11/03	100%	OB					1		SP		L/MD				SAND, fine, pumiceous, light whitish brown. 1
			100%	OB													
			100%	SPT		0/0/1 N=1	1	6	2		Pt	W	F				PEAT, clayey, wet, high plasticity, dark brownish black, organic. 2
ESTUARINE ALLUVIAL SEDIMENTS (PUKETOKA FORMATION)			100%	TUBE													NO CORE RECOVERED.
			100%	OB		• 62/6kPa		5	3		MH		St				SILT, very sandy (fine to medium), wet, moderate to high plasticity, dark slightly greenish grey, minor carbonaceous particles, thickly bedded. 3
											CH						CLAY, silty, stiff, wet, highly plastic, dark grey, some carbonaceous particles.
			100%	OB		• 58/9kPa		4	4				F				- firm. 4
						• 27/3kPa		3	5								5
			100%	OB		• 39/6kPa											
			93%	OB		• 39/3kPa	2	2	6								NO CORE RECOVERED 6
			100%	TUBE									St				- stiff.
			100%	OB		• 56/12kPa		1	7								7
						• 53/9kPa											- sandy.
			93%	OB		• 53/12kPa		0	8								- silty. 8
						• 64/10kPa											
			87%	OB				-1	9		GP		L				9
											CH		St				100mm thick layer of GRAVEL, medium sub-angular clasts, light brown. CLAY, as 3.2m, stiff.
								-2	10		SP	S	L-MD				SAND, medium, saturated, dark grey, thinly bedded, minor carbonaceous laminations.

BORELOG_TT 21061.010.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH3
Hole Location: Refer to Site Plan
SHEET 2 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 791996.28 mN, 408475.40 mE
R.L. 7.89 m
DATUM
DRILL TYPE: Edson MRA260
DRILL METHOD: Rotary
DRILL FLUID: Water
HOLE STARTED: 23/09/03
HOLE FINISHED: 24/09/03
DRILLED BY: Prodrill (Cameron)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION / ROCK DESCRIPTION
ESTUARINE ALLUVIAL SEDIMENTS (PUKETOKA FORMATION)						136/36kPa		-3	11		CH	S	VSt				CLAY, silty, stiff to very stiff, saturated, highly plastic, dark grey, some carbonaceous laminations, thinly bedded.
											SP		L				SAND, fine to medium, saturated, dark grey.
			28%	OB				-4	12		ML		St				SILT, sandy, stiff, saturated, moderately plastic, light bluish grey.
											SP		L				SAND, as 10.4m, recovered as very loose.
											Pt		F				PEAT, as 1.6m.
						• 145/80kPa		-5	13		SP		L				SAND, fine to medium, saturated, dark grey.
			40%	OB				-6	14		ML		F				SILT, very sandy, firm, moderately plastic, light bluish grey with some shiny speckles, possible uphole debris.
								-7			ML		VSt				SILT, sandy, stiff to very stiff, saturated, moderately plastic, light bluish grey.
						• 110/34kPa			15		SW		L/MD				SAND, fine, clayey, saturated, dark grey with black and white grains, thickly bedded.
			93%	OB				-8			MH		St				SILT, clayey, stiff, saturated, highly plastic, dark grey with minor shiny speckles.
						• 53/3kPa			16				VSt				- becomes very stiff.
						• 130/53kPa		-9			SP		VSt/H/MD				SAND, medium, pumiceous, saturated, dark orangey yellow, lower contact at 25°.
			93%	OB					17		MH						SILT, clayey, very stiff to hard, saturated, highly plastic, light bluish grey with minor shiny speckles.
								-10									- sandy.
											CL						Grades to CLAY, very sandy, very stiff, saturated, dark grey, thinly bedded.
			0%	SPT		16/19/23 N=42			18								NO CORE RECOVERED
			100%	HQ3				-11	19		CH		H				CLAY, slightly silty, hard, wet, highly plastic, dark grey with minor shiny speckles.
																	- extremely weak.
KAAWA FORMATION			0%	SPT		11/20/30 fo 140mm N>50		-12	20								NO CORE RECOVERED

BORELOG_TT 21061010.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH3
Hole Location: Refer to Site Plan
SHEET 3 OF 3

PROJECT: Waiouru Peninsula to SH1 Link		LOCATION: East Tamaki/Otahuhu	JOB No: 21061.010
CO-ORDINATES	791996.28 mN 408475.40 mE	DRILL TYPE: Edson MRA260	HOLE STARTED: 23/09/03
		DRILL METHOD: Rotary	HOLE FINISHED: 24/09/03
R.L.	7.89 m		DRILLED BY: Prodrill (Cameron)
DATUM		DRILL FLUID: Water	LOGGED BY: D.L.R CHECKED:

GEOLOGICAL	ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION / ROCK DESCRIPTION
KAAWA FORMATION			100%	HQ3		RQD=100%		-13	21		CL	SW	H/VD				MUDSTONE, SW, extremely weak, dark grey.
			0%	SPT		18/22/23 N=45											
			100%	HQ3		RQD=100%		-14	22								- 3J80°,Planar, smooth, tight, spacing 10mm - B0°,Planar, smooth, tight
			0%	SPT		50 for 110mm N>50		-15	23								- B0°,Planar, smooth, tight
			100%	HQ3		RQD=100%		-16	24								**END OF BOREHOLE AT 24.0m** 32mm diameter UPVC standpipe installed in base of hole.
								-17	25								
								-18	26								
								-19	27								
								-20	28								
								-21	29								
								-22	30								

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH12
Hole Location: Refer to Site Plan
SHEET 1 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN
mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 10/10/03
HOLE FINISHED: 13/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.

FLUID LOSS | WATER | CORE RECOVERY | METHOD | CASING | TESTS | SAMPLES | R.L. (m) | DEPTH (m)

ENGINEERING DESCRIPTION

GRAPHIC LOG | CLASSIFICATION SYMBOL | MOISTURE CONDITION / WEATHERING | STRENGTH/DENSITY CLASSIFICATION | SHEAR STRENGTH (kPa) | COMPRESSIVE STRENGTH (MPa) | DEFECT SPACING (mm)

SOIL DESCRIPTION
Soil type, minor components, plasticity or particle size, colour.

ROCK DESCRIPTION
Substance: Rock type, particle size, colour, minor components.
Defects: Type, inclination, thickness, roughness, filling.

HARDFILL		100%	OB					0	GW	M	MD	GRAVELS to 40mm.
FILL		100%	OB						GM			GRAVELS, silty/light brown SILT with angular gravels to 25mm.
ALLUVIUM (PUKETOKA FORMATION)	26/11/03	100%	TUBE		• 107/50kPa	1		1	ML		VSt	SILT, slightly sandy, light grey and yellow with fibrous, decomposed roots.
		60%	OB						SW		L/MD	SAND, slightly silty, grey with organic flecks.
		100%	TUBE		• 59/22kPa	2		2				
PUMICEOUS ALLUVIUM (PUKETOKA FORMATION)		5%	OB					3	SW		MD	-grey, pumiceous SAND, high core loss
		100%D0%	HQ3$PT		50/150mm	3		4	ML		H	SILT, slightly sandy, light grey, pumiceous.
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)		100%	HQ3					5	ML		VSt	SILT, sandy, dark grey.
												-with very thin clayey layers.
					• 78/34kPa	4		6	ML		St	SILT, clayey, grey.
		100%	TUBE									
		100%	OB		• 92/38kPa			7				
					• 96/42kPa	5						
		100%	TUBE					8				
		100%	OB		• 110/31kPa						VSt	-with brown organic stain.
					• 116/42kPa			9				
		100%	OB		• 116/27kPa							
					• 113/26kPa			10	SW		L	-thin, coarse, grey SAND layer.
									PT		VSt	PEAT, compressed amorphous, dark brown.

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BOREHOLE LOG

BOREHOLE No: BH12
Hole Location: Refer to Site Plan
SHEET 2 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 10/10/03
HOLE FINISHED: 13/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)			100%	TUBE							Pt	M	VSt				
			100%	OB		• 73/34kPa			11		ML		St				SILT, clayey, brown, organic stained.
						• 102/46kPa					ML		VSt				SILT, slightly clayey, slightly sandy, green.
			100%	OB		• 130/50kPa			12								-grey with green.
						• 194/104kPa											-grey with few organic flecks.
			100%	OB		• 107/34kPa			13								
						• 124/38kPa											
			100%	OB		• 102/28kPa			14								-with sandy pockets.
						• 110/32kPa					MH						-very clayey layer.
			100%	OB		• 119/32kPa			15		SW						-very thin SAND layer.
						• 123/52kPa					ML						SILT, clayey, light green with few sandy pockets.
KAAWA FORMATION			100%	OB		• UTP			16		ML		H				SILT, slightly sandy, grey, compact, uncemented.
			100%	SPT		• UTP	6						H/VD				-sandy with very thin clayey layers.
						21 32 20/70mm N>50			17								
			100%	HQ3					18								-thin dark brown organic stained layer.
			100%	HQ3					19								-clayey with thin sandy layers.
			0%	SPT		32 50/140mm N>100			20								

BORELOG_TT 21061.003.GPJ 04/12/03

NZGD ID: BH_65560

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH12
Hole Location: Refer to Site Plan
SHEET 3 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN
mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 10/10/03
HOLE FINISHED: 13/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL								ENGINEERING DESCRIPTION							
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	WEATHERING: MOISTURE CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa) 10 25 50 100 200	COMPRESSIVE STRENGTH (MPa) 1 5 12.5 25 50 100 200	DEFECT SPACING (mm) 60 200 600 2000	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
KAAWA FORMATION			100%	HQ3					21		ML	M	H/VD				-grey with layers of faint brown organic stain.
			100%	HQ3					22								
			0%	SPT		50/110mm N>100											
									23								END OF BOREHOLE AT 22.61m 32mm dia uPVC standpipe installed in base of hole
									24								
									25								
									26								
									27								
									28								
									29								
									30								

BORELOG_TT 21061.003.GPJ 04/12/03

NZGD ID: BH_65560

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH13
Hole Location: Refer to Site Plan
SHEET 1 OF 2

PROJECT: Waiouru Peninsula to SH1 Link | LOCATION: East Tamaki/Otahuhu | JOB No: 21061

CO-ORDINATES mN / mE | DRILL TYPE: Edson MRA 260 | HOLE STARTED: 13/10/03

R.L. m | DRILL METHOD: Rotary | HOLE FINISHED: 13/10/03

DATUM | DRILL FLUID: Water | DRILLED BY: Prodrill Ltd | LOGGED BY: L.A | CHECKED: A.S

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
TOPSOIL			100%	WASHOB		UTP					OL	M					SILT, organic.
FILL			100%	OB		102/46kPa					GM/ML		MD/VSt				SILT, gravelly, yellow with brick and concrete gravels to 0.3m.
		13/10/03	100%	OB		18/6kPa			1		ML						SILT, light brown and grey with occasional gravels to 25mm. 1
RECENT ALLUVIUM			0%	TUBE							ML		VS				SILT, dark grey with dark brown stain, slightly organic. -dark grey with pieces of decomposed wood. 2
			100%	OB		106/52kPa			2		ML		VSt				SILT, clayey, grey.
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)			100%	OB		92/40kPa			3				St				3
			100%	OB		98/50kPa	1										
			100%	TUBE					4				VSt				-grey/green with minor organic stain. 4
			100%	OB		102/46kPa											
			100%	OB		106/52kPa			5								5
			100%	TUBE		108/44kPa	2										-organic stained.
			100%	OB					6								6
			100%	OB		121/39kPa	3				OL						SILT, organic, dark brown.
			100%	TUBE					7		Pt						PEAT, amorphous, black, compressed. 7
			100%	OB		133/62kPa					ML						SILT, clayey, organic stained with flecks of decomposed wood. -grey.
						104/30kPa											
			100%	OB		148/65kPa			8		ML						8
						103/74kPa			9								SILT, slightly sandy, grey/green. -grey. 9
			100%	OB		119/36kPa											
						116/41kPa			10								

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH13
Hole Location: Refer to Site Plan
SHEET 2 OF 2

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN
mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 13/10/03
HOLE FINISHED: 13/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION / ROCK DESCRIPTION
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)			100%	OB		• 104/36kPa			11		ML	M	VSt				11
			100%	TUBE		• 132/44kPa	4										
			100%	OB		• 136/38kPa			12		ML						-brown, organic stained layer. 12
						• 163/52kPa											-grey/green.
			100%	OB		• 122/38kPa			13								-slightly clayey. 13
						• 163/70kPa											-occasional organic flecks.
			100%	OB		• 58/10kPa			14		SW		L				SAND, slightly silty, grey with shell pieces. 14
KAAWA FORMATION			100%	SPT		• UTP	5				ML		H				SILT, grey, very compact.
			100%	HQ3		17 26 25/90mm N>50			15								15
			100%	HQ3					16								-weakly cemented. 16
			0%	SPT		30 20/60mm N>100			17								17
			100%	HQ3			6		18								18
			100%	HQ3			7		19								19
			0%	SPT		50/110mm N>100			20								END OF BOREHOLE AT 19.81m

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BORELOG_T1 21061.003.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH14
Hole Location: Refer to Site Plan
SHEET 1 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN
mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 14/10/03
HOLE FINISHED: 15/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.

TOPSOIL
FILL

ALLUVIUM (PUKETOKA FORMATION)

ESTUARINE SEDIMENTS (PUKETOKA FORMATION)

ENGINEERING DESCRIPTION

FLUID LOSS | WATER | CORE RECOVERY | METHOD | CASING | TESTS | SAMPLES | R.L. (m) | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MOISTURE CONDITION / WEATHERING | STRENGTH/DENSITY CLASSIFICATION | SHEAR STRENGTH (kPa) | COMPRESSIVE STRENGTH (MPa) | DEFECT SPACING (mm)

26/11/03

CORE RECOVERY	METHOD	CASING
100%	OB	
100%	OB	
100%	OB	
40%	TUBE	
50%	OB	
60%	TUBE	
100%	OB	
100%	TUBE	
60%	OB	
100%	OB	
100%	TUBE	
100%	OB	
100%	OB	
100%	TUBE	

TESTS:
- 124/46kPa
- 135/96kPa
- 111/52kPa
- 70/38kPa
- 80/26kPa
- 86/28kPa
- 104/30kPa
- 89/21kPa
- 104/26kPa
- 95/30kPa
- 111/30kPa
- 101/28kPa
- 126/60kPa

SAMPLES: 1, 2, 3, 4, 5

DEPTH (m)	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION
0	OL	M	VSt
0	ML		
1	ML		
2			St
3	SW		L
3	ML		St
5	ML		
7			
8			VSt
9	Pt		
10			

SOIL DESCRIPTION
Soil type, minor components, plasticity or particle size, colour.

ROCK DESCRIPTION
Substance: Rock type, particle size, colour, minor components.
Defects: Type, inclination, thickness, roughness, filling.

SILT, organic.

SILT, clayey, light brown and yellow with gravels to 25mm.

SILT, clayey, dark yellow.

-slightly clayey, light grey and yellow.

SILT, clayey, grey and yellow.

SAND, medium grained, grey.

SILT, pumiceous, light grey.

SILT, clayey, grey.

-with faint organic stain.

-organic stained with thin sandy layers.

PEAT, compressed, dark brown/black.

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH14
Hole Location: Refer to Site Plan
SHEET 2 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 14/10/03
HOLE FINISHED: 15/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)			100%	OB		• 102/28kPa			11		ML	M	VSt				SILT, clayey, grey with organic stain.
						• 132/52kPa					ML						SILT, slightly clayey, slightly sandy, grey/green.
			100%	OB		• 121/60kPa			12								-grey.
						• 141/58kPa											
			100%	OB		• 110/40kPa			13								
						• 118/36kPa											
			100%	OB		• 124/38kPa			14								-green.
						• 118/42kPa											
			100%	OB		• 133/46kPa			15								-with flecks of decomposed wood.
						• 145/58kPa											
KAAWA FORMATION			100%	OB		• UTP					ML		H				SILT, slightly sandy, grey, compact.
						• UTP			16		SW		VD				SAND, slightly silty, weakly cemented, grey with white.
			0%	SPT		30 20/85mm N>100	6										
			100%	HQ3			7		17								-with very thin clay layers.
			100%	HQ3					18								
			0%	SPT		29 30 20/70mm N>100											
			100%	HQ3					19		ML		H				SILT, clayey, grey, weakly cemented.
											SW						-faint, organic stain.
									20								

BOREHOLE_TT 21061.003.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH14
Hole Location: Refer to Site Plan
SHEET 3 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061

CO-ORDINATES mN
mE
R.L. m
DATUM

DRILL TYPE: Edson MRA 260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 14/10/03
HOLE FINISHED: 15/10/03
DRILLED BY: Prodrill Ltd
LOGGED BY: L.A CHECKED: A.S

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa) 10 25 50 100 200	COMPRESSIVE STRENGTH (MPa) 1 5 20 50 100 200	DEFECT SPACING (mm) 50 250 1000 2000	SOIL DESCRIPTION / ROCK DESCRIPTION
			0%	SPT		21/150mm ~~50/130mm~~ N>100											

END OF BOREHOLE AT 20.28m

32mm diameter UPVC standpipe installed in base of hole.

SOIL DESCRIPTION
Soil type, minor components, plasticity or particle size, colour.

ROCK DESCRIPTION
Substance: Rock type, particle size, colour, minor components.
Defects: Type, inclination, thickness, roughness, filling.

BORELOG_TT 21061.003.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH103
Hole Location: Refer to Site Plan
SHEET 1 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 40.00 mN, 40.00 mE
R.L. 1.00 m
DATUM

DRILL TYPE: Barge Mounted
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 09/10/03
HOLE FINISHED: 09/10/03
DRILLED BY: Prodrill (Dave)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL									ENGINEERING DESCRIPTION							
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
ESTUARINE MUD ESTUARINE SEDIMENTS PUKETOKA FORMATION			100% 100% 0% 53% 100% 100% 100% 90% 0%	OB OB SPT HQ3 HQ3 HQ3 HQ3 HQ3 SPT		• UTP 20 22 8 for 40mm N>50 4 7 28 N=35		0 -1 -2 -3 -4 -5 -6 -7 -8	1 2 3 4 5 6 7 8 9 10		CH ML SP CH Pt ML SP CH SP	S S D H D H D				CLAY, soft, saturated, highly plastic, dark grey, many shells and shell fragments. SILT, slightly clayey, hard, dark greenish grey, thinly bedded. 1 SAND, fine, saturated, light greenish grey, weakly cemented. - becomes medium grained. 2 CLAY, hard, dark grey. 3 - Joint 70°,Planar, Smooth, Tight. Grades over 100mm to PEAT, silty, saturated, moderately plastic, dark brown. 4 SILT, slightly sandy, hard, dark brownish grey with few shiny speckles. - becomes sandy and dark greenish grey with shiny speckles. 5 6 7 SAND, fine to medium, saturated, dark grey with few shiny speckles. CLAY, silty, hard, saturated, highly plastic, dark grey. 8 SAND, fine to medium, saturated, dark greenish grey with shiny speckles and shell fragments throughout. 9

BORELOG_TT 21061.010.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH103
Hole Location: Refer to Site Plan
SHEET 2 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 40.00 mN, 40.00 mE
R.L. 1.00 m
DATUM

DRILL TYPE: Barge Mounted
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 09/10/03
HOLE FINISHED: 09/10/03
DRILLED BY: Prodrill (Dave)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	ENGINEERING DESCRIPTION
KAAWA FORMATION			100%	HQ							SM	MW	VD				SANDSTONE, medium, moderately weathered, extremely weak, dark grey with red black and white flecks, many shell fragments throughout, moderately thinly bedded.
			0%	SPT		50 for 130mm N>100		-10	11								
			100%	HQ3		RQD = 100%											-Joint 65°, Curved, Rough, Tight.
								-11	12								
			95%	HQ3		RQD = 85%											-Joint40°,Planar, Rough, Partly open (0.5mm)
								-12	13								- very weak.
			100%	HQ3		RQD = 100%		-13	14								
								-14	15		CL	HW	H				MUDSTONE, highly weathered, extremely weak to hard, light grey.
			80%	HQ3		RQD = 90%		-15	16			MW	VD				SANDSTONE, as 10.2m, but medium to coarse grained.
												SW					- weak and slightly weathered.
			100%	HQ3		RQD = 90%		-16	17								- shells no longer present.
																	- Joint25°, slightly curved, Rough, Tight.
								-17	18								- Joint75°, Curved) , Rough, Open (0.6mm)
		40 l/min	80%	HQ3		RQD = 70%		-18	19								- Joint 30°, Slightly Curved, Rough, Tight. - Joint 60°, Slightly Curved, Rough , Open (0.6mm) - artesian water flowing at 40 l/min.
									20								- Joint 65°, Slightly Curved , Rough, Tight.

SOIL DESCRIPTION
Soil type, minor components, plasticity or particle size, colour.

ROCK DESCRIPTION
Substance: Rock type, particle size, colour, minor components.
Defects: Type, inclination, thickness, roughness, filling.

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH103
Hole Location: Refer to Site Plan
SHEET 3 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 40.00 mN, 40.00 mE
R.L. 1.00 m
DATUM
DRILL TYPE: Barge Mounted
DRILL METHOD: Rotary
DRILL FLUID: Water
HOLE STARTED: 09/10/03
HOLE FINISHED: 09/10/03
DRILLED BY: Prodrill (Dave)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa) 10 20 50 100 200	COMPRESSIVE STRENGTH (MPa) 5 10 20 50 100 250	DEFECT SPACING (mm) 60 200 600 2000	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
			90%	HQ3		RQD = 90%		-20	21								END OF BOREHOLE AT 21m
								-21	22								
								-22	23								
								-23	24								
								-24	25								
								-25	26								
								-26	27								
								-27	28								
								-28	29								
									30								

BORELOG_TT 21061.010.GPJ 04/12/03

NZGD ID: BH_65570

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH104
Hole Location: Refer to Site Plan
SHEET 1 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 60.00 mN, 60.00 mE
R.L. 1.00 m
DATUM

DRILL TYPE: Edson MRA260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 09/10/03
HOLE FINISHED: 10/10/03
DRILLED BY: Prodrill (Ant)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION / ROCK DESCRIPTION
Engineered FILL			80%	OB				0	1		GW	W		TP				GRAVEL, fine, some coarse sand, wet, dark greyish brown.
			80%	OB														1
ESTUARINE/ALLUVIAL SEDIMENTS - PUKETOKA FORMATION			70%	OB							MH			VSt				SILT, minor coarse sand, very stiff, wet, highly plastic, light greyish green.
											SP			L				SAND, very fine, wet, light grey with orangey brown streaks, thinly bedded.
			70%	OB				-1	2		MH	S		VSt				SILT, slightly sandy, very stiff, saturated, highly plastic, dark grey with minor shell fragments. 2
						• 49/13kPa					CH			St				CLAY, silty, stiff, saturated, highly plastic, dark grey.
			100%	OB		• 57/11kPa		-2	3									3
						• 57/11kPa					SW			D				SAND, coarse, silty, dark grey with rare light greenish grey pebbles.
			90%	OB				-3	4		ML			H				SILT, sandy, hard, moderately plastic, dark greyish green, thinly bedded. 4
			0%	SPT		19 19 20 N=39		-4	5									5
			100%	HQ3														- becomes very sandy.
		47%		HQ3				-5	6		SW			D				SAND, fine, very silty, saturated, light brownish grey with minor shiny speckles, minor carbonaceous laminations. 6
								-6	7									7
											Pt							PEAT, sandy, saturated, not plastic, dark blackish brown.
		100%		HQ3				-7	8		MH			VSt				SILT, sandy, very stiff, saturated, highly plastic, light brownish grey, rare carbonaceous particles. 8
											ML							SILT, very sandy, very stiff, saturated, moderately plastic, light greenish grey with shiny speckles.
								-8	9									9
		100%		HQ3					10									- low plasticity.

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH104
Hole Location: Refer to Site Plan
SHEET 2 OF 3

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 60.00 mN, 60.00 mE
R.L. 1.00 m
DATUM

DRILL TYPE: Edson MRA260
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 09/10/03
HOLE FINISHED: 10/10/03
DRILLED BY: Prodrill (Ant)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL | ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
ESTUARINE/ALLUVIAL SEDIMENTS - PUKETOKA FORMATION			100%	HQ3				-10	11		ML	S	VSt				11
											MH						- high plasticity. - very clayey.
			100%	HQ3				-11	12								12 - slightly sandy.
								-12	13								13
											MH		H				SILT, clayey, hard, saturated, highly plastic, light bluish grey with shiny speckles.
KAAWA FORMATION			100%	HQ3				-13	14		CH						14 CLAY, hard, saturated, highly plastic, dark grey, thinly bedded, minor carbonaceous laminations.
			100%	HQ3				-14	15								15
								-15	16								16
			100%	HQ3				-16	17								17
											ML	MW					SILTSTONE, moderately weathered, extremely weak, dark grey, few carbonaceous laminations. 18
			100%	HQ3				-17	18								
								-18	19								- Joint 70°, Planar, Smooth, Tight. 19 19 - 19.6m - sandy - Joint30°, Planar, Rough, Tight.
									20								- Joint40°, Planar, Smooth, Tight.

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH104
Hole Location: Refer to Site Plan
SHEET 3 OF 3

PROJECT: Waiouru Peninsula to SH1 Link | LOCATION: East Tamaki/Otahuhu | JOB No: 21061.010

CO-ORDINATES 60.00 mN, 60.00 mE | DRILL TYPE: Edson MRA260 | HOLE STARTED: 09/10/03

DRILL METHOD: Rotary | HOLE FINISHED: 10/10/03

R.L. 1.00 m | DRILLED BY: Prodrill (Ant)

DATUM | DRILL FLUID: Water | LOGGED BY: D.L.R CHECKED:

GEOLOGICAL									ENGINEERING DESCRIPTION							
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
			100%	HQ3						ML	MW	H				- very weak.
			0%	SPT		50 for 90mm N>100		-20 21								- Joint 50°, Slightly Curved, Smooth, Tight. 21
																END OF BOREHOLE AT 21.1m
								-21 22								22
								-22 23								23
								-23 24								24
								-24 25								25
								-25 26								26
								-26 27								27
								-27 28								28
								-28 29								29
								30								

BORELOG_TT 21061.010.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH105
Hole Location: Refer to Site Plan
SHEET 1 OF 2

PROJECT: Waiouru Peninsula to SH1 Link
LOCATION: East Tamaki/Otahuhu
JOB No: 21061.010

CO-ORDINATES 80.00 mN, 80.00 mE
R.L. 1.00 m
DATUM

DRILL TYPE: Barge Mounted
DRILL METHOD: Rotary
DRILL FLUID: Water

HOLE STARTED: 10/10/03
HOLE FINISHED: 10/10/03
DRILLED BY: Prodrill (Dave)
LOGGED BY: D.L.R CHECKED:

GEOLOGICAL / ENGINEERING DESCRIPTION

GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	ENGINEERING DESCRIPTION
ESTUARINE MUD			0%	OB							CL	S	VS				CLAY, very soft, saturated, moderately plastic, dark grey, some shell layers.
ESTUARINE SEDIMENTS (PUKETOKA FORMATION)			100%	OB				0	1		ML	W	VSt/H				SILT, sandy, very stiff to hard, wet, moderate plasticity, light greenish grey with minor dark greenish grey mottles, thinly bedded. 1
			100%	OB				-1	2		SW		MD				SAND, fine, silty, wet, light greenish grey. 2 - minor fine gravel.
			100%	OB		• 181/33kPa		-2	3		ML		VSt/H				SILT, sandy, very stiff, wet, light brownish grey, very thinly bedded. 3
						• 156/39kPa		-3	4		CH						CLAY, slightly silty, very stiff, wet, highly plastic, light bluish grey. 4 - minor carbonaceous laminations.
			100%	OB				-4	5		Pt						PEAT, silty, very stiff, wet, dark brown/black. 5
											MH						SILT, clayey, very stiff, wet, highly plastic, light greyish brown, minor carbonaceous particles.
			100%	OB		• UTP		-5	6		SW		MD				SAND, silty, wet, light greenish grey with shiny speckles. 6
						• 89/33kPa		-6	7		MH		St				SILT, stiff to very stiff, wet, highly plastic, light greenish grey with shiny speckles. 7
			100%	OB		• 116/18kPa							VSt				
						• 121/22kPa		-7	8								- becomes sandy. 8
			100%	OB				-8	9		MH	S					SILT, clayey, very stiff, saturated, highly plastic, light grey. 9
KAAWA FORMATION											SW		MD				SAND, fine to medium, silty, dark greyish green, minor shell fragments.
			0%	SPT		28 22 for 45mm			10			MW	VD				SANDSTONE, medium, moderately weathered, very weak to weak, dark green with red and white flecks, thin dark grey

BORELOG_TT 21061.010.GPJ 04/12/03

TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: BH105
Hole Location: Refer to Site Plan
SHEET 2 OF 2

PROJECT: Waiouru Peninsula to SH1 Link		LOCATION: East Tamaki/Otahuhu	JOB No: 21061.010
CO-ORDINATES	80.00 mN 80.00 mE	DRILL TYPE: Barge Mounted	HOLE STARTED: 10/10/03 HOLE FINISHED: 10/10/03
R.L.	1.00 m	DRILL METHOD: Rotary	DRILLED BY: Prodrill (Dave)
DATUM		DRILL FLUID: Water	LOGGED BY: D.L.R CHECKED:

GEOLOGICAL														ENGINEERING DESCRIPTION
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa) 10 25 50 100 200 / COMPRESSIVE STRENGTH (MPa) 1 5 10 50 100 200 / DEFECT SPACING (mm) 50 250 1000 2000	SOIL DESCRIPTION: Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION: Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
KAAWA FORMATION			80%	HQ3		N>100 RQD = 0		-10	11			MW	VD		beds with red and white flecks, beds oriented at many different angles up to 40°. - 10 - 11m - recovered as medium gravel. - dark grey with red, white and black flecks.
			90%	HQ3		RQD = 20		-11	12			SW			- 11 - 14m - many defects present. Orientations include 40°, 30°, 70°, 80°, all Slightly Curved, Rough, Open (0.6mm) - Joint 70°, Slightly Curved, Rough, Tight. - 12 - 14m - some coarse sand sized white and pinky grey grains. - minor fine gravel sized pebbles. - Joint 80°, Slightly Curved, Rough, Open (1mm) - vein of calcite, 75°, curved, 2mm thick.
			100%	HQ3		RQD = 0		-12	13						
								-13	14						**END OF BOREHOLE AT 14m** Piezometer installed. See sheet BH105P.
								-14	15						
								-15	16						
								-16	17						
								-17	18						
								-18	19						
									20						

21542 - 25910

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47 GEORGE STREET, NEWMARKET
BOX 4241 PH 379-1200 AUCKLAND

LOG OF DRILLHOLE

PROJECT Otahuhu C Power Station

HOLE No. DH-OC2

FEATURE Foundations LOCATION Hellaby Road CO-ORDINATES N 692100 E 308587

ANGLE FROM HORIZONTAL 90° DIRECTION N/A R.L.COLLAR 8.63m

DESCRIPTION OF CORE (WEATHERING, RELATIVE STRENGTH, COLOUR, NAME, DEFECT TYPE, LITHOLOGICAL FEATURES (bedding, foliation, mineralogy, cement etc.), STRATIGRAPHIC UNIT)	SPT	DEFECT DESCRIPTION (JOINTS, BEDDING, SEAMS, SHATTER, SHEAR AND CRUSH ZONES, FOLIATION, SCHISTOSITY- attitude, spacing, continuity, roughness, infilling, etc.) / SOIL DESCRIPTION (consistency, relative density, water content, plasticity, grading, group symbol etc.)	DRILLING METHOD
Fill		Orange brown, CLAYEY SILT, moist, firm, some volcanic GRAVEL clasts up to 10mm diam.	HQTT
Fill/ Reworked Ash	1/2/1	to white, mottled greyish SANDY SILT, some CLAY, firm to stiff, non-plastic, moist	SPT
	N=3	some thin, brown organic zones, plastic	HQTT
Fill - dredging, some estuarine sand and shell fragments, some inorganic (wire, concrete slabs) material, woody material	1/2/3	Brown, dark orange SILTY SAND, minor CLAY inclusions, moist, firm to stiff, volcanic clasts up to 20mm, shell fragments	SPT
	N=5	grades to fine to medium SAND, medium dense, moist, loose, soft to firm, minor brown SILT inclusions	HQTT
		Concrete slab	
		Tube Sample	Shelby
Tauranga Group Alluvium	1/1/2	Dark grey, SILT, some fine SAND, occasional GRAVEL clasts 15mm, firm	SPT
	N=3	Light grey, greenish SANDY SILT, slightly organic	HQTT
Peaty SILT		Dark brown CLAYEY SILT, organic, soft to firm, zone of peaty SILT	
		Poor Recovery	
		Tube Sample	Shelby
	0/1/5	Grey SILT to fine SAND, moist, firm to stiff, woody material, mica	SPT
	N=6	becomes peaty SILT, soft, wet, plastic, some coarse SAND	HQTT
Peaty SILT		Tube Sample	Shelby
Peaty SILT		Dark grey, banded dark brown, peaty, organic SILT, thinly bedded, moist, plastic, firm to stiff, some mica specks	HQTT
	1/2/5		SPT
	N=7		HQTT
	0/2/3	some thin SANDY layers	SPT
	N=5	becomes light grey CLAYEY SILT, with	

PIEZOMETER

DRILL WATER LOSS %

DRILLER: Drillwell

STARTED: 10/1/01

FINISHED: 10/2/01

DRILL: Tractor

WEATHERING
UW - Unweathered
SW - Slightly weathered
MW - Moderately weathered
HW - Highly weathered
CW - Completely weathered
RW - Residually weathered

RELATIVE STRENGTH
VS - Very strong
S - Strong
MS - Moderately strong
MW - Moderately weak
W - Weak
VW - Very weak
EW - Extremely weak

PIEZOMETER LEGEND
DRILL CUTTINGS
BENTONITE SEAL
FILTER PACK
SLOTTED SCREEN

EXPLANATION
SPTs bag sampled
Push Tube Samples at
5.2 - 5.7m
7.7 - 8.2m
9.2 - 9.7m
UCS Sample at
21.7 - 21.9m
H_2O levels 12/10 → 3.9m

VANE SHEAR STRENGTH TEST
50/15 peak/remoulded
UTP - unable to penetrate
SUOW - sunk under own weight
Sst - Sandstone
Zst - Siltstone

PROJECT 25 120 02C
LOGGED BP
DATE 10/1/01
TRACED BP
CHECKED TND
LENGTH 23m
CORE BOXES 5
SHEET 1 OF 2

DRILLING METHOD
OB - 100mm Open Barrel
NQTT - NQ Triple Tube
HQTT - HQ Triple Tube
PQTT - PQ Triple Tube
SPT - Standard Penetration Test
PERC - Percussion (air) Drilling
RC - Reverse Circulation
Shelby - Tube Sample

Pilcon Miniature Shear Vane
DR No. Blade No.
Factor.
Vane Shear Strength per NZGS Guideline.

TONYS DRILLHOLE OTAHUHUC.GPJ TONY_LOG.GDT 17/10/01

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LOG OF DRILLHOLE

PROJECT Otahuhu C Power Station
HOLE No. DH-OC2
FEATURE Foundations LOCATION Hellaby Road CO-ORDINATES N 692100 E 308587
ANGLE FROM HORIZONTAL 90° DIRECTION N/A R.L.COLLAR 8.63m

DESCRIPTION OF CORE (WEATHERING, RELATIVE STRENGTH, COLOUR, NAME, DEFECT TYPE, LITHOLOGICAL FEATURES (bedding, foliation, mineralogy, cement etc.), STRATIGRAPHIC UNIT)	SPT	DEPTH m	DEFECT DESCRIPTION (JOINTS, BEDDING, SEAMS, SHATTER, SHEAR AND CRUSH ZONES, FOLIATION, SCHISTOSITY- attitude, spacing, continuity, roughness, infilling, etc.) / SOIL DESCRIPTION (consistency, relative density, water content, plasticity, grading, group symbol etc.)	DRILLING METHOD
Tauranga Group Alluvium		13	organic inclusions, stiff Dark grey, banded dark brown, peaty, organic SILT, thinly bedded, moist, plastic, firm to stiff, some mica specks	HQTT
HW Tamaki SANDSTONE, Greenish grey SILTSTONE and fine SANDSTONE, thinly to moderately thinly bedded, minor carbonaceous material	4/6/10 N=16	14	Greenish grey, fine to medium SAND, very stiff, mica, some decomposed rootlets	SPT HQTT
	2/4/5 N=9	15	becomes alternating SILT and fine to medium SAND layers, thinly bedded, subhorizontal	SPT HQTT
	2/2/4 N=6	16	SILT beds become moderately thin, very stiff to hard possible bioturbation infilled with coarse SAND	SPT HQTT
SW/MW Tamaki Sandstone, SANDY SILTSTONE with brown fine SANDSTONE in thin beds, very weak	20/52 N>50	17	Greenish blue SANDY SILT, occasional fine SAND, thinly bedded, some brown organic banding	SPT HQTT
SW Coarse SANDSTONE, very weak to weak, some brittle zones becomes weak	19/50 N>50	18	Dark grey, coarse SAND, homogenous, well cemented, massive	SPT HQTT
	22/39 N>50	19		SPT HQTT
SILTSTONE, weak	18/50 N>50	20		SPT
		21		
		22	SILT bed, thin, subhorizontal	
		23	End of Hole 23m	
		24		

Tamaki Sandstone

DRILLER: Drillwell
STARTED: 10/1/01
FINISHED: 10/2/01
DRILL: Tractor

WEATHERING
UW - Unweathered
SW - Slightly weathered
MW - Moderately weathered
HW - Highly weathered
CW - Completely weathered
RW - Residually weathered

RELATIVE STRENGTH
VS - Very strong
S - Strong
MS - Moderately strong
MW - Moderately weak
W - Weak
VW - Very weak
EW - Extremely weak

PIEZOMETER LEGEND
DRILL CUTTINGS
BENTONITE SEAL
FILTER PACK
SLOTTED SCREEN

EXPLANATION
SPTs bag sampled
Push Tube Samples at
5.2 - 5.7m
7.7 - 8.2m
9.2 - 9.7m
UCS Sample at
21.7 - 21.9m

VANE SHEAR STRENGTH TEST
50/15 peak/remoulded
UTP - unable to penetrate
SUOW - sunk under own weight
Sst - Sandstone
Zst - Siltstone

PROJECT 25 120 02C
LOGGED BP
DATE 10/1/01
TRACED BP
CHECKED TND
LENGTH 23m
CORE BOXES 5
SHEET 2 OF 2

DRILLING METHOD
OB - 100mm Open Barrel
NQTT - NQ Triple Tube
HQTT - HQ Triple Tube
PQTT - PQ Triple Tube
SPT - Standard Penetration Test
PERC - Percussion (air) Drilling
RC - Reverse Circulation
Shelby - Tube Sample

Pilcon Miniature Shear Vane
DR No. Blade No.
Factor.
Vane Shear Strength per NZGS Guideline.

TONYS DRILLHOLE OTAHUHUC.GPJ TONY_LOG.GDT 17/10/01

Highbrook – Private Plan Change
Assessment of Landscape and Visual Effects

LA4 Landscape Architects
PO Box 5669, Victoria Street West
Auckland 1010

Assessment of Landscape and Visual Effects
Quality Assurance Statement

Prepared by:

Director

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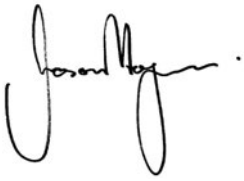
Reviewed by:



Director

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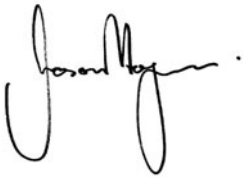
Approved for Issue by:



Director

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Status: **Final**
Date: 18 February 2022

File Number/Name	21-054 Highbrook Private Plan Change
Author	Rob Pryor, Director | NZILA Registered Landscape Architect
Client	Highbrook Living Limited

Table of Contents

Annexures

1. Introduction

1.1 LA4 Landscape Architects have been requested by Highbrook Living Limited to undertake an Assessment of Landscape and Visual Effects ('**ALVE**') of the Highbrook Private Plan Change Request ('**PPC**') for the proposed rezoning of approximately 5 hectares of land bounded by Highbrook Drive to the south and east, the southern motorway ('**SH1**') to the west and the Tāmaki River to the north, Highbrook, Auckland ('the **Site**').

1.2 This assessment investigates the existing character of the Site and surrounding environment, identifies the key landscape and visual features of the Site and describes the visual and landscape implications of the PPC on the Site and surrounding area. Investigations of the Site and surrounding environment were undertaken in November 2021.

2. Project Overview

2.1 The Site is located within the Auckland Unitary Plan ('**AUP**') Business – Light Industry Zone ('**LI**') and covers a total area of approximately 5 hectares. The Private Plan Change Request seeks to rezone the land as Residential – Terrace Housing and Apartment Buildings Zone ('**THAB**') in its entirety.

2.2 A Development Concept Plan has been prepared and designed in accordance with established urban design principles and is a potential option for development. Indicatively it would ensure a high level of visual amenity, comprehensively planted with trees and riparian plantings along the esplanade reserve to enhance its overall amenity and assist in its integration with the surrounding urban and industrial area over time. The Development Concept Plan is included in **Annexure 1**.

2.3 The Development Concept Plan envisages larger apartment buildings to the southern portion of the Site and smaller scale buildings to the northern portion, overlooking the Tāmaki River within a well landscaped setting. The concept plan also illustrates a 20m wide esplanade reserve along the Tāmaki River frontage to the Site with a number of facilities including walking tracks, playground and seating areas.

3. Assessment Methodology

3.1 The key to assessing the landscape character and visual amenity effects of the PPC on this landscape is first to establish the existing characteristics and values of the landscape and then to assess the effects of this proposal on them. In accordance with the Resource Management Act (1991) this includes an assessment of the cumulative effects of the proposal combined with existing developments.

3.2 The methodology used in this assessment is designed to assess whether or not development enabled by the PPC would have adverse landscape effects on the nature and quality of the surroundings, including views from the coastal area. The following methodology has been used in this assessment.

Background Review

3.3 A review of the existing background information and plans has been undertaken in relation to the landscape and visual amenity aspects of the proposal. Key landscape and environmental factors which would potentially be affected by the proposal were identified and reviewed.

Site and Landscape Evaluation – Landscape and Visual Environment

3.4 Detailed site investigations and an analysis of the Site and surrounding environment were undertaken. The landscape character, visual and amenity values were identified and outlined and a photographic record of the Site and surrounding environment compiled. Key landscape features and elements were identified and an analysis of the landscape values and the landscape's ability to accommodate change as a result of development enabled by the PPC undertaken.

3.5 An analysis of the existing landscape and natural character of the Site and surrounding environment was undertaken. The analysis identified how vulnerable the Site and surrounding environment is to change. This included:

i) aesthetic value (vividness, complexity, cohesion, legibility, and other less tangible values)
ii) natural character values
iii) natural processes, patterns and elements
iv) rarity
v) visual absorption capability including land uses, vegetation cover and type and topographic diversity and type
vi) exposure and visibility.

Visual Catchment and Viewing Audience

3.6 The physical area that would be visually affected by the proposal was defined. In turn, this indicated the range, type and size of viewing audiences that would be impacted upon.

Viewpoint Selection

3.7 The next step was to establish a platform from which detailed analysis could be carried out. The most practical platform for carrying out such analysis is a series of viewpoints, strategically located within the visual catchment in order to assess the impact of the proposal for most of the potential viewing audiences.

3.8 Detailed analysis of the implications of the proposal was then carried out using a Visual Effects Matrix, which ensures that each view and changes within each view are evaluated thoroughly and consistently.

Landscape Character and Visual Effects Assessment

3.9 A specific analysis and assessment was undertaken and key questions addressed derived from the very nature of anticipated effects on landscape character and visual amenity. This process assessed the effects of the proposal and identified the aspects which were likely to have high or adverse visual, landscape or visual amenity impacts.

Statutory Context

3.10 A review of the relevant statutory provisions was undertaken to identify the key landscape and visual related objectives and policies in order to assess the proposal against them.

Conclusions

3.11 An evaluation of the proposal as a whole taking into account all the preceding analysis was then undertaken in relation to potential effects on landscape character and visual amenity values. Conclusions were made in relation to the potential landscape and visual effects, landscape character and amenity effects of the development including recommendations for avoiding, remedying or mitigating these effects.

4. The Subject Site and Surrounding Environment

4.1 The Site comprises of approximately 5ha of land bounded by SH1 to the west, Highbrook Drive to the south and east and the Tāmaki River to the north. The topography of the Site is predominantly flat at approximately RL 5m dropping off more steeply towards the Tāmaki River edge.

4.2 The Site is undeveloped at present and characterised by wide open grassed areas in the southern part. A large stand of semi-mature indigenous vegetation extends along the western part of the Site comprising kānuka (*Kunzea ericoides*), mānuka (*Leptospermum scoparium*), flax (*Phormium tenax*), pūriri (*Vitex lucens*), karaka (*Corynocarpus laevigatus*), karo (*Pittosporum crassifolium),* coprosma (*Coprosma repens*), cabbage tree (*Cordyline australis*), interspersed with some exotic gums (*Eucalyptus species*) and noxious weed species including woolly nightshade, privet and toetoe.

4.3 A double row of poplar trees extends along the southern road frontage and a large stand of pine and macrocarpas intermixed with some exotic and indigenous species and noxious weeds is located in the northeastern part of the Site. Mangroves extend along the coastal edge.

4.4 A metalled access road traverses the Site with the southern part extending down to the river edge and the original river loading dock and piles. The road currently provides maintenance access for the large advertising billboard located in the southwestern part of the Site facing towards the motorway. The access road also extends north towards the Highbrook Drive underpass.

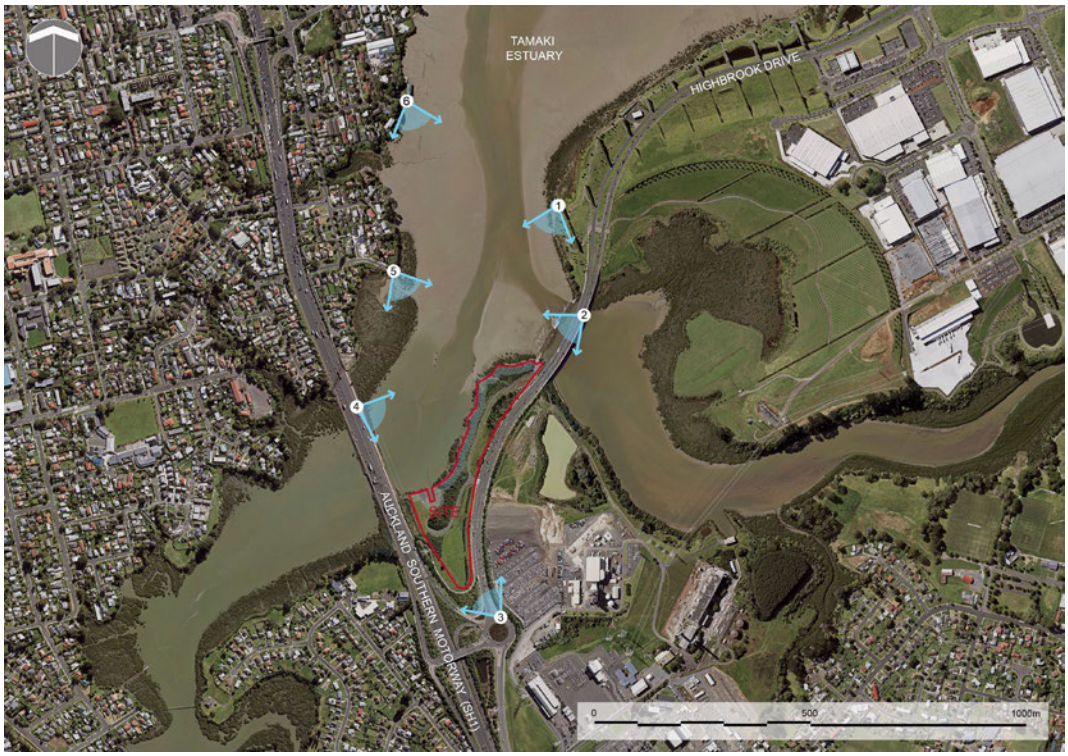


Figure 1: The Site

4.5 To the east of the Site is Light Industry zoned land. Part of this area is utilised by a car distribution and auto logistics company with hundreds of vehicles awaiting distribution throughout the country. Transpower's Ōtara substation is located immediately to the south of here.

4.6 The Site abuts the tidal Tāmaki River / Tāmaki Estuary to the north, which is an estuarial arm and harbour of the Hauraki Gulf. It extends south for 15km from its mouth between St Heliers and the Bucklands Beach peninsula at Musick Point. It has several smaller tributary arms which extend from it, with the Pakuranga Creek and Ōtara Creek in the east, and the Ōtāhuhu Creek and Panmure Basin in the west.

4.7 To the northeast of the Site is the Ōtara Creek and the Pukewairiki Crater. The Pukewairiki (Waiouru) tuff ring has an indistinct, craterlike depression about 300m in diameter. The crater is breached to the southwest by tidal creeks and has an 8m terrace along the Tāmaki River. It is one of the oldest volcanoes in the Auckland volcanic field. Pukewairiki is designated as an Outstanding Natural Feature 236 ('**ONF**') in the AUP.

4.8 To the east of Pukewairiki is Ngati Ōtara Park – a large sports park with coastal access and extensive walking tracks amongst mature trees. A playground, toilets and changing rooms, fitness equipment, netball and basketball courts, sports fields, artificial cricket pitches, picnic tables and seating, and parking are inside the park. On the northern side of the Tāmaki River is the residential area of northeastern Ōtāhuhu with Seaside Park located at the eastern end of the peninsula with a range of sports fields, community buildings, sports clubs and a boat ramp.

*Refer to **Annexure 2**: Site photographs*

The wider landscape context

4.9 The Highbrook Business Park encompasses 107ha of industrial, commercial and retail businesses situated on the Waiouru Peninsula. The Waiouru Peninsula lies between the Pakuranga Creek to the north, the Tāmaki Creek to the west and the Ōtara Creek to the south. Highbrook Crossing serves as a focal point for Highbrook's growing community, with a mix of cafes, childcare, gym, and conference centres.

4.10 A public open space network has been integrated into Highbrook Business Park and comprises a network of walkways and cycleways enabling public access along the coastal frontages bordering the Business Park, and the vesting of approximately 40 hectares of the Pukewairiki Crater area as a public reserve.

4.11 The open space corridor of Highbrook Park runs along the coastline and is characterised by planted stormwater ponds, formal lines of poplar tree plantings, substantial groupings of native tree and shrub species, mown lawn, and native coastal edge plantings along the shoreline. The combined 14km pedestrian and cycle track is formed in metal and winds its way along the coastal edge and around the stormwater ponds and various small scale gullies draining to the Tāmaki River.

4.12 The wider East Tāmaki area is a manufacturing and distribution hub of some 2000 businesses strategically located close to the motorway, airport and port. The rest of the East Tāmaki business precinct is a mixture of manufacturing, related services and retail/wholesale outlets. Vehicle servicing and sales yards feature prominently while it is also home to some major franchises. The residential area of Ōtara and the Ōtara Town Centre are located further to the southeast of the Site along with the Manukau Institute of Technology, schools, commercial and business area.

5. Evaluation of the Proposal

5.1 The key to assessing the landscape and visual effects of development enabled by the PPC is first to establish the existing characteristics and values of the landscape and then to assess the effects of development enabled by the PPC on them. In accordance with the Resource Management Act 1991 ('**RMA**') this includes an assessment of the

cumulative effects of the proposal combined with existing development within Highbrook.

5.2 The purpose of this section is to provide an assessment of the nature and degree of potential landscape effects and the appropriateness of the PPC and development opportunities. The assessment responds to matters related to landscape and visual amenity. It also considers the anticipated outcomes of the THAB zone proposed (in relation to the AUP provisions) and their suitability in this setting.

5.3 The zoning sought under the PPC would enable development opportunities pertaining to the provisions associated with the anticipated AUP zoning. This PPC application is for rezoning primarily and any further matters can and would be dealt with as part of future resource consent processes for the respective sites.

5.4 The assessment of landscape effects takes into consideration physical changes to the landscape as a resource which may give rise to changes to its character and quality and perceived landscape values. Visual effects are a consequence of landscape effects as this is how we mainly perceive effects on landscape values. Landscape and visual effects are therefore inextricably linked and are influenced by the sensitivity of the receiving environment combined with the type and magnitude of change associated with the proposal.

5.5 Matters to be addressed in this assessment relate to the urban landscape and visual amenity include the following:

i) Natural character effects
ii) Landscape effects
iii) Visual amenity effects
iv) Construction effects

Natural Character Effects

5.6 Natural character relates to the degree of 'naturalness' or modification of a landscape. It is primarily determined by the nature and extent of modification to a landscape and can be expressed in relation to natural processes, patterns and elements in the landscape. Assessments of natural character therefore broadly assess:

i) Natural processes – the underlying formative processes that have shaped and given expression to the landscape (geological, volcanic, ecological, fluvial etc.);
ii) Natural elements – features within the landscape that are products of natural processes (landform, vegetation, waterbodies etc.);
iii) Natural patterns – the natural expression or distribution of un-manufactured elements and features within the landscape; and
iv) Development / land use – the presence or absence of development such as structures and buildings and the level of modification as a result of land use and management.

5.7 The highest levels of natural character are where there is the least modification. Natural character effects relate to the degree to which a proposal alters the biophysical and / or perceived naturalness of a landscape.

Natural Character Effects Analysis

5.8 The Site is not high in natural character values (other than the coastal edge) and has been modified through previous activities. The Site is a component of the wider modified Highbrook industrial environment in an area zoned for light industrial activities adjacent to SH1 and Highbrook Drive. Overall, the adverse effects of development enabled by the PPC on the natural character values of the Site and surrounding area

would be low. The proposed esplanade reserve with riparian plantings would enhance the natural character values of the Tāmaki River edge.

Landscape Effects

5.9 Landscape effects take into consideration the physical effects on the land resource. Assessments of landscape effects therefore investigate the likely nature and scale of change to landscape elements and characteristics. Landscape effects are primarily dependent on the landscape sensitivity of a site and its surrounds to accommodate change and development. Landscape sensitivity is influenced by landscape quality and vulnerability, or the extent to which landscape character, elements/features and values are at risk to change.

5.10 Landscape characterisation is the term used to encapsulate the process of identifying and describing landscape character areas. Each character area has a distinguishing combination of biophysical and cultural factors that make it distinctive. Characterisation provides a basis for the understanding of landscape diversity and change.

5.11 Landscape character is derived from a combination of landscape components that make up the landscape of the site that distinguishes one area from another including:

i) The elements that make up the landscape including:
   - physical influences – geology, soils, landform, drainage and waterbodies;
   - land cover, including different types of vegetation and patterns and types of tree cover; and
   - the influence of human activity, including land use and management, the character of settlements and buildings, and pattern and type of enclosure.

ii) The aesthetic and perceptual aspects of the landscape including its scale, complexity, openness, tranquillity or wilderness; and

iii) The overall character of the landscape in the area including any distinctive landscape character types or areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape.

5.12 Landscape character results from a combination of physical elements together with aesthetic and perceptual aspects that combine to make an area distinct. The surrounding landscape is heavily modified with the Highbrook industrial area, SH1 and Highbrook Drive.

5.13 Development enabled by the PPC would inevitably transform the local undeveloped character of the Site to that of a more intensive and urban development which would have an influence on the surrounding area. It is important to note however that light industrial development is anticipated and the AUP identifies the Site as an area to accommodate future development.

Landscape Effects Analysis

5.14 Based on the preceding description and analysis of the Site and surrounds it is clear that there are relatively low landscape values and sensitivity associated with the Site. The Site is a relatively degraded, modified environment lacking any significant landscape values (other than the coastal edge and indigenous vegetation), adjacent to the existing industrial area and SH1. The PPC will result in changing the existing landscape character of the Site, however, this is already provided for and anticipated by the AUP planning framework for this Site.

5.15 The key methods of mitigating for the change in landscape character are to retain and enhance where possible existing landscape features and create a quality urban development (albeit the Site being zoned for light industrial activities). There are

number of positive landscape outcomes associated with the PPC. The Development Concept Plan has been designed in accordance with established urban design principles and would ensure a high level of visual amenity, comprehensively planted with trees and riparian plantings along the Tāmaki River corridor to enhance its overall amenity and assist in its integration with the surrounding industrial and coastal area over time.

5.16 Development enabled by the PPC would result in a change in landscape character, but would ensure a superior level of amenity, albeit an urban, rather than an industrial character is achieved. I consider that the landscape effects of the proposal would be positive in contrast to development enabled by the Light Industry zoning of the Site.

Visual Effects

5.17 The assessment of visual effects analyses the perceptual (visual) response that any of the identified changes to the landscape may evoke, including effects relating to views and visual amenity. Visual sensitivity is influenced by a number of factors including the visibility of a proposal, the nature and extent of the viewing audience, the visual qualities of the proposal, and the ability to integrate any changes within the landscape setting, where applicable.

5.18 The nature and extent of visual effects are determined by a systematic analysis of the visual intrusion and qualitative change that a proposal may bring, specifically in relation to aesthetic considerations and visual character and amenity.

5.19 The methodology used in this assessment is designed to assess whether or not future development enabled by the PPC would have adverse visual effects on the nature and quality of the surrounding environment.

The process of analysing such effects involves:

i) Identification of the physical area or catchment from which development enabled by the PPC would be visible;
ii) Identification of the different viewing audiences that would be affected by future development enabled by the PPC; and
iii) Evaluation of the visual amenity effects taking into account the preceding analysis.

Visual Catchment and Viewing Audience

5.20 The visual catchment is the area from which noticeable visual effects of future development enabled by the PPC within the Site are likely to be evident to any significant degree. SH1 and Highbrook Drive surrounding the Site, result in a number of open views into the Site, however existing vegetation patterns within the Site, along the Highbrook Drive frontage and within the Highbrook coastal walkway currently provide a level of screening from parts of the wider surrounding areas.

5.21 The location of the Site surrounded on two sides by the motorway, on and off-ramps, Highbrook Drive and Tāmaki River to the north means that it has a high level of exposure from the surrounding area. Consequently, SH1, Highbrook Drive, SH1 on and off-ramps, and the Tāmaki River define the main visual catchment for the PPC.

5.22 The coastal edge of the northeastern part of the Ōtāhuhu residential area on the northern side of the Tāmaki River would be exposed to views towards the Site, this includes residents and recreational users of the foreshore, Curlew Bay, Shroffs Bay Beach Reserve and Seaside Park (albeit at distances between 375m and 1.5km away). Recreational users of the Tāmaki River, Highbrook coastal walkway and Highbrook Drive Reserve would gain views towards the Site.

5.23 The viewing audience would therefore encompass the following groups:

i) Road users on the surrounding roads including SH1, Highbrook Drive and the on and off-ramps;
ii) Pedestrians on Highbrook Drive and the Tāmaki River overbridge on the eastern side of SH1;
iii) Workers within the industrial area to the east of the Site and within parts of Highbrook Business Park;
iv) Residents and visitors within the residential properties along the coastal edge of the northeastern Ōtāhuhu residential area;
v) Recreational users of the Tāmaki River, Highbrook coastal walkway, Highbrook Drive Reserve;
vi) Recreational users of the northeastern Ōtāhuhu coastal foreshore, Curlew Bay, Shroffs Bay Beach Reserve and Seaside Park; and
vii) Distant viewers within parts of the surrounding Ōtāhuhu residential area on the western side of SH1.

5.24 Overall, the anticipated level of audience exposure would be large due to the location of the Site adjacent to the motorway, surrounding roads and Tāmaki River.

Visual Amenity Effects Analysis

5.25 The proposed future development of the Site enabled by the PPC raises a number of visual issues, including the potential effects on visual amenity to the following key areas:

i) Surrounding area
ii) Highbrook coastal walkway
iii) Surrounding road network
iv) Wider surrounding area

5.26 The visual effects of development enabled by the PPC have been assessed from representative viewpoints within the visual catchment area that have potential for visual effects. Six viewpoints have been identified in order to assess the potential visual effects. The viewpoints were selected as locations that capture and fairly represent the range of public and private views towards the Site.

5.27 The assessment has been undertaken by reference the following viewpoints:

Viewpoint 1: Highbrook coastal walkway
Viewpoint 2: Ōtara Creek bridge
Viewpoint 3: Highbrook Drive roundabout
Viewpoint 4: Tāmaki River overbridge
Viewpoint 5: Curlew Bay Road
Viewpoint 6: Shroffs Bay Beach Reserve

Refer to: ***Annexure 3:*** *The Site and Viewpoint Location Map*
Annexure 4: *Viewpoint Photographs 1-6*

5.28 Photographs have been taken with a 35mm SLR camera with a fixed 50mm lens from the viewpoints and a detailed assessment and analysis of potential effects have been carried out using a Visual Effects Matrix, which ensures that each view and changes within each view are evaluated thoroughly and consistently.

5.29 The key factors contained in that matrix are given in detail in **Annexure 5.** It covers aspects such as the sensitivity of the view to change, the size of the viewing audience that would be affected, the legibility of the proposed development, how well the proposal integrates with its surroundings and whether or not the proposal intrudes into any existing views.

5.30 The total score given in the descriptions denote the overall visual effects rating. The following seven-point scale has been used to rate effects, based on the guidelines contained within the Tuia Pito Ora NZILA 'Aotearoa Landscape Assessment Guidelines 2021':

Very Low | **Low** | **Low-Moderate**| **Moderate | Moderate-High** | **High | Very High**

Very Low Effect
No appreciable change to the visual character of the landscape, its landscape values and/or amenity values.

Low Effect
Limited change to the visual character of the landscape, with a low level of effect in relation to landscape values and/or amenity values.

Low-Moderate Effect
Evident visual change to the visual character of the landscape with a low to moderate level of effect in relation to landscape values and/or amenity values.

Moderate Effect
Appreciable change to the visual character of the landscape with a moderate level of effect in relation to landscape values and/or amenity values.

Moderate-High Effect
Marked change to the visual character of the landscape with a moderate to high level of effect in relation to landscape values and/or amenity values.

High Effect
Significant change to the visual character of the landscape with a high level of effect in relation to landscape values and/or amenity values.

Very High Effect
Fundamental change to the visual character of the landscape with a very high level of effect in relation to landscape values and/or amenity values. The proposal causes significant adverse effects that cannot be avoided, remedied or mitigated.

5.31 In assessing the significance of effects, the assessment also considers the nature of effects in terms of whether this would be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also result where the visual change is considered to be benign in the context of where it occurs.

5.32 The assessment has been undertaken in terms of the following criteria:

i) **Quality of the view** – the relative quality and sensitivity of views into the Site, including landscape character and visual amenity values.

ii) **Viewpoint** | **perceptual factors** – the type and size of population exposed to views into the Site, the viewing distance to the Site, and other factors which indicate its sensitivity in terms of both viewing audience and the inherent exposure of the view towards the Site due to its physical character.

iii) **Urban amenity** – the impact of future development on the wider surrounding rural and urban amenity.

iv) **Urban form** – the degree to which future development would fit into the existing rural and urban context of the surrounding environs.

v) **Visual intrusion** | **contrast** – the intrusion into or obstruction of views to landscape features in the locality and beyond and the impact upon key landscape elements and patterns.

vi) **Mitigation potential** – the extent to which any potential adverse effects of the proposal could be mitigated through integration into its surrounds by specific measures.

Surrounding Area

5.33 **Viewpoint 4** is taken from the Tāmaki River overbridge looking southeast, **Viewpoint 5** is taken from Curlew Bay Road looking in a southerly direction towards the Site and **Viewpoint 6** is taken from Shroffs Bay Beach Reserve looking southwest. The Site extends from SH1 in the west to the Ōtara Creek bridge in the east. The views portray the coastal characteristics of the foreground estuarine Tāmaki River and beyond to the Highbrook Business Park. Prominent in the view is the infrastructure of Transpower's electricity substation with the HV electricity pylons and overhead wires traversing the skyline.

5.34 These views are representative of the recreational users of the Tāmaki River coastal foreshore, residents within northeastern parts of the Ōtāhuhu residential area and pedestrians using the Tāmaki River overbridge from McManus Place to Highbrook. Closer views would be gained by recreational users of the river including kayakers, boaties and rowers. Motorists travelling in southerly directions along SH1 would gain similar views to Viewpoint 4, albeit transient and brief, travelling at speeds of 100kph.

5.35 From these representative viewing locations, development enabled by the PPC would be viewed in the context of the existing highly modified characteristics of Highbrook Business Park and the adjacent motorway. The degree of intrusion that the proposal offers is therefore limited by these built elements that are already an established part of the surrounding environment.

5.36 Development enabled by the PPC would be viewed from here across the mangrove foreground of the coastal edge. The proposal would not detract from the existing coastal character of the surrounding landscape and would integrate well into the landscape.

5.37 For these viewers, the existing outlook would change noticeably from a vegetated and undeveloped scene, into a comprehensive urban view with a hierarchy of building heights and forms. Although this would constitute a noticeable change to the existing character, it is not the type of change which is unexpected within the planning context of the area, and the quality nature of the future urban development would ensure that a suitable level of amenity is achieved (and a higher level than the underlying LI zoning would achieve).

5.38 Once the Site is developed, the existing views would be replaced with a combination of residential urban development with planted streetscapes, open spaces and the esplanade reserve extending along the along the coastal foreshore. Development enabled by the proposal would not be out of context due to the current zoning of the land. The future form would be read as part of the wider urban context.

5.39 The planted esplanade reserve along the coastal edge would assist in breaking up the extent of the urban development and filter views so that although the view would have changed from a vegetated undeveloped scene to an urban one, the full extent of the development would not be apparent. Development enabled by the PPC, however, would change the landscape character and visual amenity currently experienced for the visual catchment to the north, however this would not be inconsistent with the change in character if the Site was to be developed for industrial purposes.

5.40 The proposal would have a minimal impact on the existing coastal amenity values of the Site and surrounding light industrial environs and would be viewed as an integral component of the existing modified environment. Overall, the visual effects for the

viewing audience from the surrounding area to the north would be low-moderate, albeit anticipated through the current zoning of the Site for light industrial development.

Surrounding Road Network

5.41 For road users on the surrounding road network, the development of the Site is likely to result in visual effects of little significance as development enabled by the PPC would be seen as part of the pattern of land use change occurring locally within the surrounding environs. **Viewpoint 2** is taken from the Ōtara Creek bridge, **Viewpoint 3** from the Highbrook Drive roundabout and **Viewpoint 4** from the Tāmaki River overbridge.

5.42 Although a large audience, the general road users are unlikely to be particularly sensitive to future development, as they would have fleeting views of the Site whilst moving through a landscape, which already exhibits diverse characteristics adjoining SH1 and the Highbrook Business Park. Travelling east along Highbrook Road, the proposal would be viewed against the backdrop of the Highbrook Business Park with its large scale buildings within a well landscaped setting. Travelling west, development within the PPC Site would be seen in conjunction with the industrial activities flanking the southern side of Highbrook Drive.

5.43 Overall, the visual effects from the surrounding road network would be low and seen within the context of the prevailing industrial context.

Highbrook coastal walkway

5.44 **Viewpoint 1** is taken from the southern end of the Highbrook coastal walkway looking in a southwesterly direction across the Tāmaki River approximately 300m away from the Site. This is one of the few views available from the coastal walkway due to the southwest orientation of the walkway and existing tree plantings. Both the formal and more organic tree and shrub plantings have been positioned to provide framed views from the walkway to the coastline, along the park corridor and back towards the business park, resulting in a relatively well contained and enclosed coastal parkland character.

5.45 This view is representative of the recreational users of the coastal walkway in the vicinity. The view from here extends across from the Ōtara Creek bridge towards the Site across the foreground of the Tāmaki River and beyond to SH1 and the Ōtāhuhu residential area. The industrial characteristics of the area to the east are apparent from here along with the infrastructure of the Ōtara substation with transmission pylons and overhead wires.

5.46 Development enabled by the PPC would be viewed from here across the foreground of the Tāmaki River. The proposal would not detract from the existing coastal character of the surrounding landscape and would integrate well into the landscape. For these recreational viewers, the existing outlook would change into an urban view with built development. While development would change the existing character, it is anticipated within the planning context of the area, and a suitable level of amenity would be achieved, to a higher level than the underlying LI zoning would achieve.

5.47 Development enabled by the PPC would not be out of context due to the zoning of the land and the PPC would be read as part of the wider Highbrook business environment. Overall, the visual effects for recreational users of the coastal walkway would be moderate-low and anticipated through the current zoning of the Site for light industrial development.

Wider Surrounding Area

5.48 More distant views may be gained from parts of the Ōtāhuhu residential area on the western side of SH1 to the west and northwest of the Site and from distant locations within the surrounding landscape. Views towards development enabled by the PPC would be highly variable due to distance, orientation of the view, diversity of elements within the view and screening elements including the motorway infrastructure, buildings, substation and vegetation.

5.49 While development enabled by the PPC would be visible from parts of the wider surrounding area, I consider that the visual effects would be low to very low and entirely acceptable within the context of the existing and planned future urban environment.

6. Statutory Context

6.1 A comprehensive outline of the proposed PPC relating to statutory and non-statutory provisions is provided within the Statutory Assessment Report prepared by Babbage Consultants. This section of the assessment outlines, by way of background, the provisions most relevant to landscape and visual amenity matters. These are set out further in **Annexure 6** to help frame the assessment.

6.2 In relation to the RMA, the following sections are relevant:

i) Section 6(a) - the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development,

ii) Section 7(b) - the efficient use and development of natural and physical resources,
iii) Section 7(c) - the maintenance and enhancement of amenity values, and
iv) Section 7(f) - maintenance and enhancement of the quality of the environment.

6.3 Development enabled by the PPC will be an efficient use of natural and physical resources and enhance the amenity values and quality of the environment through the proposed residential zoning of the Site which seeks to use the existing qualities of the coastal location and utilise existing open space amenities and infrastructure within the Highbrook Business Park.

6.4 In relation to the relevant provisions of the AUP from a landscape and visual amenity perspective, the objectives, and policies of the existing LI zone and proposed THAB zone have been considered. This allows an assessment of the PPC zoning and its application across the PPC area in the context of the existing environment.

6.5 The PPC proposes to use the existing provisions associated with the THAB zone under the AUP. These have been tested and proved as appropriate as part of the establishment of the AUP. This PPC application is for rezoning only, and any further matters can and would be dealt with as part of future resource consent processes for the respective sites.

6.6 The Site is currently zoned Business – Light Industry ('**LI**') in the AUP. The LI zone anticipates industrial activities that do not generate objectionable odour, dust or noise. This includes manufacturing, production, logistics, storage, transport and distribution activities. The anticipated level of amenity is lower than the centres zones, Business – General Business Zone and Business – Mixed Use Zone. The zone allows for building heights up to 20m.

6.7 As outlined previously the PPC seeks to rezone the land as Terrace Housing and Apartment Buildings ('**THAB**'). The THAB zone is a high intensity zone enabling a greater intensity of residential development. This zone provides for urban residential

living in the form of terrace housing and apartments. The purpose of the zone is to make efficient use of land and infrastructure, increase the capacity of housing and ensure that residents have convenient access to services, employment, education facilities, retail and entertainment opportunities, public open space and public transport. The zone provides for the greatest density, height and scale of development of all the residential zones. Buildings are enabled up to five storeys and, in identified Height Variation Control areas, six or seven storeys.

Auckland Unitary Plan (Operative in Part)

6.8 The main relevant sections of the AUP relating to the landscape and visual amenity effects that the PPC has been assessed against include:

B2. Tāhuhu whakaruruhau ā-taone – Urban growth and form
B8. Toitū te taiwhenua – Coastal environment
E18. Natural character of the coastal environment
H6. Residential – Terrace Housing and Apartment Buildings Zone
H17. Business – Light Industry Zone

6.9 With respect to the matters addressed in these objectives and policies, I comment as follows:

i) The Site and the immediately surrounding landscape are part of the established Highbrook Business Park which is a modified environment through business, industrial and commercial activities.

ii) The natural characteristics and qualities that contribute to the natural character of the coastal environment would not be adversely affected by the proposal. The provision of the esplanade reserve and riparian plantings would enhance the natural character of the Tāmaki River edge. The Pukewairiki ONF would be unaffected by development enabled by the PPC.

iii) Development within the PPC area would achieve a comprehensive residential environment which would have high levels of amenity and allow for a range of housing densities and typologies. Potential adverse landscape and visual effects on the environment would be avoided, remedied or mitigated in accordance with the operative AUP provisions.

iv) Development enabled by the PPC would ensure a high quality environment. The Development Concept Plan has responded to the intrinsic qualities and physical characteristics of the Site through the location of the housing typologies as well as the open space network.

v) Adverse effects on amenity values and the natural environment, both within the zone and on adjacent areas, would be managed to a greater degree than the current LI zoning.

vi) Development would be in keeping with the areas planned urban built character and form.

vii) Consistent with the THAB zone provisions, a high level of on-site residential amenity would be provided for residents and the coastal edge would be significantly enhanced through the provision of the esplanade reserve via future development of the Site. Provision of non-residential activities (such as café, shop, workspace) compatible with the scale and intensity of development anticipated by the THAB zone would contribute to the amenity of the neighbourhood and well-being of the community.

viii) Development enabled by the PPC would be superior to the Site's planned light industry built character and the Site has the capacity to visually absorb the proposed development within a well landscaped setting. The enhanced coastal edge would significantly increase the coastal character values of the Tāmaki River environments.

ix) Public access to and along the coastal marine area would be maintained and enhanced in a manner that is sensitive to the use and values of the area through the provision of the planted and grassed esplanade reserve.

x) The open space, recreation and amenity values of the coastal environment would be maintained and enhanced through the provision of public walking tracks within the future esplanade reserve.

New Zealand Coastal Policy Statement 2010 (NZCPS)

6.10 Noting that the Tāmaki River is tidal, the Site is within the coastal environment and therefore the provisions of NZCPS are relevant for the PPC. In relation to the landscape and natural character considerations, Policies 13 (Preservation of natural character) and 14 (Restoration of natural character) are relevant to this assessment.

6.11 Policy 13 requires the preservation of natural character of the coastal environment and to protect it from inappropriate subdivision, use and development. Adverse effects on areas of outstanding natural character are to be avoided and significant adverse effects are to be avoided while other adverse effects are to be avoided, remedied or mitigated. In the context of this PPC, it is noted that there are no outstanding natural character values within the Site or surrounding landscape. The PPC area is located on areas of land that have been modified previously, and the Site does not contribute to the natural character values of the coastal environment. The natural characteristics and qualities that contribute to the natural character of the coastal environment would not be adversely affected by development enabled by the PPC. The provision of the esplanade reserve and riparian plantings would enhance the natural character values of the Tāmaki River edge.

6.12 Policy 14 promotes the restoration or rehabilitation of the natural character of the coastal environment. The existing vegetation along the coastal edge is not managed for its natural values and noxious weed species are present, adversely affecting the natural character of the area. The future development of the Site will provide opportunities for planting of the esplanade reserve areas with indigenous vegetation.

6.13 I therefore consider that future development enabled by the PPC would be generally consistent with the intent of the landscape, visual, natural character and amenity objectives and policies of the relevant statutory documents and when considered in totality would be entirely acceptable in landscape character and visual amenity terms.

7. Conclusions

7.1 The proposed development of the Site resulting from the PPC would change its current vegetated and undeveloped landscape character. Development enabled by the PPC would however be consistent with the Site being zoned LI with development envisaged in the AUP.

7.2 While the proposed development would result in a significant visual change from the Site’s current state to one with urban characteristics, such visual change is anticipated and is in accordance with the key planning initiatives for the area within the AUP (albeit the current LI zoning anticipating a lower level of amenity than proposed by the PPC).

7.3 In conclusion, the PPC would fulfil the need for residential and urban intensification and provide an opportunity for an innovative and environmentally sustainable urban development. The PPC would be largely consistent with regional growth strategies for the area and would result in a high-quality urban development with a range of positive landscape and environmental outcomes.

7.4 I consider that the proposed Highbrook Private Plan Change is appropriate in this urban setting from a landscape and visual amenity perspective and would result in a superior outcome than development enabled through the current Light Industrial zoning of the Site.

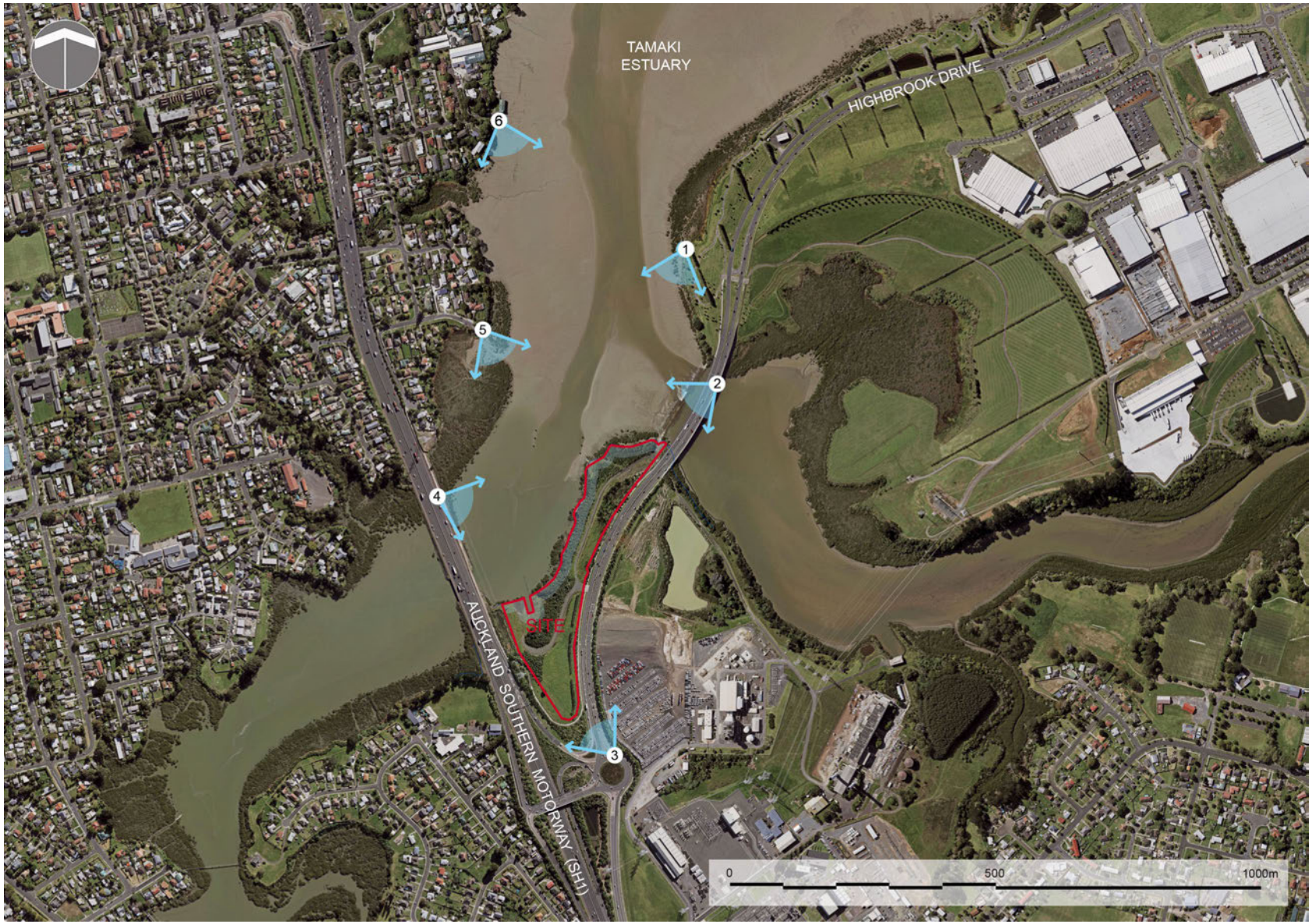
Rob Pryor
Director | Registered NZILA Landscape Architect
LA4 Landscape Architects
February 2022

Annexure 1: Development Concept Plan

Annexure 2: Site Photographs


Cheers to all tastes.

Annexure 3: Viewpoint Location Map



Annexure 4: Viewpoint Photographs

Viewpoint 1: Highbrook Coastal Walkway

Viewpoint 2: Ōtara Creek Bridge

Viewpoint 3: Highbrook Drive roundabout

Viewpoint 4: SH1 Tāmaki River overbridge

Viewpoint 5: Curlew Bay Road

Viewpoint 6: Shroffs Bay Beach Reserve

Annexure 5: Visual Effects Matrix Methodology

Use of a matrix offers one way in which the various facets of visual change – qualitative change, visual contrast etc. – can be pulled together and evaluated in a way which gives due weight to each. This matrix was designed to measure the scale of no or low visual effects through to high visual effects.

The assessment matrix is broken into two stages. The first involves looking at the existing situation and assessing the visual quality and sensitivity of the present view to change. This is followed by an evaluation of the changes associated with the proposed development. Key issues or variables are addressed within each stage and ratings for these are eventually combined to provide a composite visual effects rating. Set out below is the basic structure, showing what these key variables are and how they are arranged:

PART A - SENSITIVITY OF THE VIEW AND SITE TO CHANGE

A1. Analysis of the view's **Visual Quality** is carried out on the basis that higher quality views are more sensitive to potential disruption and degradation than poorer quality views.

A2. Analysis of the view's **Visual Absorption Capability** is an evaluation of the degree to which a view is predisposed, or otherwise, to change by virtue of its land uses and/or screening elements and will either accommodate change or make it stand out from its setting.

A3. Analysis of **Perceptual Factors.** In this section the type and size of population represented by the viewpoint, the viewing distance to the development site and other factors which indicate its sensitivity in terms of both viewing audience and the inherent exposure of the viewpoint to the site because of its physical character is assessed.

PART B - INTRUSION AND QUALITATIVE CHANGE

B1. Analysis of **Intrusion | Contrast**: the degree to which a proposal's location and specific structural content and appearance make it either blend into its surroundings or be made to stand out from them in terms of form, linearity, mass, colour and physical factors. Whether or not the proposal would intrude into existing views.

B2. Analysis of the proposal's **Aesthetic Characteristics**: exploring the degree to which it would relate aesthetically and in terms of general character to its surroundings.

Ratings are combined for each viewpoint via a system of averaging and multiplying of ratings to progressively indicate each viewpoint's **sensitivity**, followed by levels of **intrusion and qualitative change**, and culminate in an **overall visual effects rating**.

Annexure 6: Relevant Statutory Provisions

B8. Toitū te taiwhenua – Coastal environment

B8.2. Natural character

B8.2.1. Objectives

…

(2) Subdivision, use and development in the coastal environment are designed, located and managed to preserve the characteristics and qualities that contribute to the natural character of the coastal environment.

(3) Where practicable, in the coastal environment areas with degraded natural character are restored or rehabilitated and areas of high and outstanding natural character are enhanced.

B8.2.2. Policies

…

(1) Avoid significant adverse effects and avoid, remedy or mitigate other adverse effects on natural character of the coastal environment not identified as outstanding natural character and high natural character from inappropriate subdivision, use and development.

B8.3. Subdivision, use and development

B8.3.1. Objectives

(1) Subdivision, use and development in the coastal environment are located in appropriate places and are of an appropriate form and within appropriate limits, taking into account the range of uses and values of the coastal environment.

(2) The adverse effects of subdivision, use and development on the values of the coastal environment are avoided, remedied or mitigated.

(3) The natural and physical resources of the coastal environment are used efficiently and activities that depend on the use of the natural and physical resources of the coastal environment are provided for in appropriate locations.

…

(5) Uses and developments that have a need to locate on land above and below the mean high water springs are provided for in an integrated manner.

…

B8.3.2. Policies Use and development

(1) Recognise the contribution that use and development of the coastal environment make to the social, economic and cultural well-being of people and communities.

(2) Avoid or mitigate sprawling or sporadic patterns of subdivision, use and development in the coastal environment by all of the following:

(a) concentrating subdivision, use and development within areas already characterised by development and where natural character values are already compromised;

(b) avoiding urban activities in areas with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal, historic heritage and special character; and

….

(4) Require subdivision, use and development in the coastal environment to avoid, remedy or mitigate the adverse effects of activities above and below the mean high water springs, including the effects on existing uses and on the coastal receiving environment.

B8.4. Public access and open space

B8.4.1. Objectives

(1) Public access to and along the coastal marine area is maintained and enhanced, except where it is appropriate to restrict that access, in a manner that is sensitive to the use and values of an area.

…

(3) The open space, recreation and amenity values of the coastal environment are maintained or enhanced, including through the provision of public facilities in appropriate locations.

B8.4.2. Policies

(1) Subdivision, use and development in the coastal environment must, where practicable, do all of the following:

(a) maintain and where possible enhance public access to and along the coastal marine area, including through the provision of esplanade reserves and strips;

(b) be designed and located to minimise impacts on public use of and access to and along the coastal marine area;

(c) be set back from the coastal marine area to protect public open space values and access; and

(d) take into account the likely impact of coastal processes and climate change, and be set back sufficiently to not compromise the ability of future generations to have access to and along the coast.

(2) Provide for a range of open space and recreational use of the coastal environment by doing all of the following:

(a) identifying areas for recreational use, including land-based facilities for those uses, where this ensures the efficient use of the coastal environment;

(b) enabling the provision of facilities in appropriate locations that enhance public access and amenity values;

(c) enabling Māori cultural activities and customary use; and

…

E18. Natural character of the coastal environment

E18.2. Objectives

(1) The natural characteristics and qualities that contribute to the natural character of the coastal environment are maintained while providing for subdivision, use and development.

(2) Where practical the natural character values of the coastal environment are restored or rehabilitated.

E18.3. Policies

(1) Manage subdivision, use and development of land adjoining scheduled outstanding natural character or high natural character areas that have a biophysical or visual linkage with the scheduled area to:

(a) avoid adverse effects on the natural characteristics and qualities that contribute to the natural character values of outstanding natural character areas; and

(b) avoid significant adverse effects, and avoid, remedy or mitigate other adverse effects, on the characteristics and qualities that contribute to the natural character values of high natural character areas.

(2) Maintain significant landforms and indigenous vegetation and habitats that are connected to outstanding natural character and high natural character areas.

(3) Manage the effects of subdivision, use and development in the coastal environment to avoid significant adverse effects, and avoid, remedy or mitigate other adverse effects, on the characteristics and qualities that contribute to natural character values.

…

(4) Promote land use practices and restoration activities that will restore or rehabilitate natural character values

H6. Residential – Terrace Housing and Apartment Buildings Zone

H6.2. Objectives

(2) Land adjacent to centres and near the public transport network is efficiently used to provide high-density urban living that increases housing capacity and choice and access to centres and public transport.

(3) Development is in keeping with the areas planned urban built character of predominantly five, six or seven storey buildings in identified areas, in a variety of forms.

(4) Development provides quality on-site residential amenity for residents and the street.

(5) Non-residential activities provide for the community's social, economic and cultural well-being, while being compatible with the scale and intensity of development anticipated by the zone so as to contribute to the amenity of the neighbourhood.

H6.3. Policies

(1) Enable a variety of housing types at high densities including terrace housing and apartments and integrated residential development such as retirement villages.

(2) Require the height, bulk, form and appearance of development and the provision of setbacks and landscaped areas to achieve a high-density urban built character of predominantly five, six or seven storey buildings in identified areas, in a variety of forms.

(3) Encourage development to achieve attractive and safe streets and public open spaces including by:

(a) providing for passive surveillance

(b) optimising front yard landscaping

(c) minimising visual dominance of garage doors.

(4) In identified locations adjacent to centres, enable greater building height through the application of the Height Variation Control where the additional development potential enabled:

(a) provides an appropriate transition in building scale from the adjoining higher density business zone to neighbouring lower intensity residential zones, and;

(b) supports public transport, social infrastructure and the vitality of the adjoining centre,

(5) Manage the height and bulk of development to maintain daylight access and a reasonable standard of privacy, and to minimise visual dominance effects to adjoining sites and developments.

(6) Require accommodation to be designed to meet the day to day needs of residents by:

(a) providing privacy and outlook; and

(b) providing access to daylight and sunlight, and providing the amenities necessary for those residents.

(7) Recognise the functional and operational requirements of activities and development.

(8) Encourage accommodation to have useable and accessible outdoor living space.

(9) Restrict the maximum impervious area on a site in order to manage the amount of stormwater runoff generated by a development and ensure that adverse effects on water quality, quantity and amenity values are avoided or mitigated.

(10) Provide for non-residential activities that:

(a) support the social and economic well-being of the community;

(b) are in keeping with the with the scale and intensity of development anticipated within the zone; avoid, remedy or mitigate adverse effects on residential amenity; and will not detract from the vitality of the Business – City Centre Zone, Business – Metropolitan Centre Zone and Business – Town Centre Zone.

H17. Business – Light Industry Zone

H17.2. Objectives

(1) Light industrial activities locate and function efficiently within the zone.

(2) The establishment of activities that may compromise the efficiency and functionality of the zone for light industrial activities is avoided.

(3) Adverse effects on amenity values and the natural environment, both within the zone and on adjacent areas, are managed.

(4) Development avoids, remedies or mitigates adverse effects on the amenity of adjacent public open spaces and residential zones.

H17.3. Policies

(1) Enable light industrial activities to locate in the zone.

(2) Avoid reverse sensitivity effects from activities that may constrain the establishment and operation of light industrial activities.

(3) Avoid activities that do not support the primary function of the zone.

(4) Require development adjacent to open space zones, residential zones and special purpose zones to manage adverse amenity effects on those zones.

(5) In identified locations enable greater building height than the standard zone height, having regard to whether the greater height:

(a) is an efficient use of land; and

(b) can be accommodated without significant adverse effects on adjacent residential zones; considering the size and depth of the area.

(6) Avoid reverse sensitivity effects from activities within the Business – Light Industry Zone that may constrain the establishment and operation of heavy industrial activities within the Business – Heavy Industry Zone.

(7) Require activities adjacent to residential zones to avoid, remedy or mitigate adverse effects on amenity values of those areas.

15 July 2022

Job No: 64872#BEE2

eTrack No: 200041623

Attention: Matt Doughney

Highbrook Living Limited

HIGHBROOK PRIVATE PLAN CHANGE REQUEST – PRELIMINARY LAND CONTAMINATION REVIEW

Dear Matt

Background

Babbage Consultants Limited (Babbage) was engaged by Highbrook Living Limited to undertake a desktop study to support a private plan change request to re-zone a portion of land (herein referred to as the site) they hold, which forms part of a larger property at 8 Sparky Road (LOT 2 DP 209362), Otara, Auckland (herein referred to as the property). The land to be included in the proposed private plan change request has an area of approximately 4.4 ha, as shown in Map No. 1 (attached) and is currently zoned Business – Light Industry under the Auckland Unitary Plan Operative in Part (AUP OP). The private plan change request seeks to re-zone the site to high density residential land use.

The desktop study was limited to a review of historical aerial photographs covering the area and received Auckland Council property files to identify current or historical potential contamination sources at the site. The findings of this review are presented below.

The site

The site forms part of the larger former Ōtāhuhu power station property, which was closed in 2015.

According to Auckland Council (AC) GeoMaps website[1], the site is bounded by Highbrook Drive to the east, Tāmaki River (estuary) to the north and west, the Southern Motorway to the west, and Highbrook Drive off ramp to the south. The site slopes steeply to the north and west, with a fall of some 6 m. The Otara Creek flows into the Tamaki River to the east of the site.

[1] AC October 11 2021. Auckland Council GeoMaps. Retrieved from https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

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Review of aerial photographs

Aerial photographs sourced from AC GeoMaps website, Google Earth Pro[2] and Retrolens website[3] were reviewed to identify past land uses at the site and the immediately surrounding area. In summary, the following was observed at the site:

- The site was used as pastoral land until the late 1960s.
- The eastern portion of site developed into a diesel fuel above ground storage tank (AST) farm and containment berm as part of Ōtāhuhu power station in the late 1960s.
- The south-western and north-eastern portions of the site were subject to land reclamation activities between 1967 and 1979.

The Ōtāhuhu power station was later decommissioned in 2013[4]. A summary of historical aerial photographs is provided in Attachment 1 and copies of selected historical aerial photographs are presented in Appendix A.

Review of Auckland Council property files

The key documents and findings related to the site and nearby areas are summarised in Table 1 below. The investigation works are attached in Attachment 2 and the results of the documents assessed are presented in Appendix B. Map No. 2 attached shows the location of the former investigation works areas.

Table 1. Summary of reviewed documents.

Document	Summary of findings
Ōtāhuhu Peaker Project Ground Contamination Assessment by Tonkin & Taylor Ltd (T&T) 2011[5]	Twenty-two test pits across the property, in particular Fill Area A, Fill Area C, west of Ōtāhuhu B Power Station, former inlet that existed south of the holding pond, the former AST farm that existed west of the holding pond, and a separate smaller AST farm located east of Ōtāhuhu A Power Station. Concentrations of metals, polycyclic aromatic hydrocarbons (PAH), total petroleum

[2] Google Earth 11 October 2021. Google Earth Pro 2021. Retrieved from https://earth.google.com/web/search/highbrrok+drive/

[3] Local Government Geospatial Alliance 11 October 2021. Retrolens Historic Image Resource. Retrieved from http://retrolens.nz/

[4] T&T October 2012. Ground Contamination Desk Study – Ōtāhuhu Power Station.

[5] Babbage was not provided with T&T 2011 report. Information summarised from Ground Contamination Desk Study by T&T 2015.

Document	Summary of findings
	hydrocarbons (TPH) were detected below NESCS[6] Soil Contaminant Standards (SCSs) for high density residential land use and Auckland Unitary Plan permitted activity (AUP PA) criteria[7] (both herein referred to as the applicable proposed land use criteria). Groundwater collected from one test pit was reported below Australian and New Zealand Environment and Conservation Council (ANZECC)[8] 95% freshwater species for PAH and TPH below 85 milligrams per litre (mg/l).
Ground Contamination Desk Study by T&T 2015	Discrete areas throughout the Ōtāhuhu Power Station property, of which the site forms part of, have been subject to past activities that have the potential to cause ground contamination. T&T further noted that concentrations present are unlikely to constrain re-use of the site for commercial/industrial activities and that contaminants appear predominantly restricted to near surface soils.
Detailed Site Assessment by Geosciences Ltd (GSL) 2018	Ten soil samples within a separate smaller AST tank farm area located east of Ōtāhuhu A Power Station, five soil samples from former underground storage tank area, and four soil samples from former transformer area (within Ōtāhuhu Power Station property but over 600 m south-east from proposed plan change site area). Concentrations of metals, PAH, TPH, BTEX (benzene, toluene, ethylbenzene, and xylene), and polychlorinated biphenyls (PCB) were detected below the applicable proposed land use criteria.
Contamination Assessment of Proposed Highbrook Drive Intersection Works by GSL 2019	Ten test pits across former AST tank farm on east side of the site (investigated portion east of Highbrook Drive only). Concentrations of metals, PAH, and TPH were detected below the applicable proposed land use criteria. Based on these results, GSL concluded that *"the soil in the area of proposed earthworks is highly unlikely to present a risk to human health, or the environment."*

[6] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

[7] AC 2016. Auckland Unitary Plan Chapter E30.6.1.4 permitted activity soil acceptance criteria.

[8] ANZECC 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

A more detailed summary of the above reviewed documents is presented in Attachment 2. Map No. 2 attached shows the location of the former investigation works areas.

Discussion

Babbage notes that the site requested to be rezoned has not had an intrusive environmental investigation performed on it. Based on the records and historical aerial photographs reviewed, Babbage has identified five areas that have potentially impacted soil from previous site activities. The areas, potential constituents of concern within each area, commentary on soil impacts, and probability of impacts to soil are presented in Figure 1 and Table 2 below.

Babbage

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CLIENT / PROJECT

Stonehill Trustees

Highbrook Private Plan Change

MAP TITLE

Map No 2. Former Investigations and Soil Disturbed Areas - Potential Contaminated Land

MAP REVISIONS

06/04/2022	Initial version by TT.

Legend

- 8 Sparky Road Site
- Highbrook Site Boundaries

Potential Contaminated Land Areas - Highbrook Site

- Area 1 - Reclamation (1969 - 1979)
- Area 2 - Reclamation (1967)
- Area 3 - Former Tank Farm (1967 - 2003)
- Area 4 - Former Construction Yard Area (2006)
- Area 5 - Soil/Fill Material Stockpiled (2006)

Former Intrusive Investigations

- Areas of T&T 2011 Investigation
- T&T 2011
- T&T 2011
- Not Investigated
- Area of GSL2018 DSI Investigation
- Area of GSL2019 Investigation

NOTES
Aerial Images - LINZ Basemap
Land Parcels - Auckland Council Geomaps

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 **@ A3**

MAP NO.

64872#BEE02

Table 2. Probability of contaminated areas with exceedances above the NESCS SCS for residential land use and AUP PA criteria.

Area	Potential contaminants of concern	Commentary on potential soil impacts	Probability of exceedances in soil
Area 1 – South-western portion (reclaimed land 1969-1979)	Unknown source and quality of reclamation fill material. Potential contaminants: Metals, PAH, TPH, polychlorinated biphenyls (PCB), and asbestos containing material (ACM).	Estimated reclaimed land area cover is approximately 8% of the total site area. T&T 2015 estimated the depth is likely to be between 0.5-5 m based on topography. Based on the constituents of concern, soil impacts can be managed or remediated if encountered.	High-medium likelihood considering the uncontrolled practices of waste disposal during that period.
Area 2 – North-eastern portion (reclaimed land 1967)	Unknown source and quality of reclamation fill material. Potential contaminants: Metals, PAH, TPH, PCB, and ACM.	Estimated reclaimed land area cover is approximately 6% of the total site area with depth estimated between 0.5-5 m (T&T 2015). Based on the constituents of concern, soil impacts can be managed or remediated if encountered.	High likelihood considering the uncontrolled practices of waste disposal during that period and visual observation of potential ACM.
Area 3 – Former tank farm within the site (1967-2003)	Unknown source and quality of fill material for containment berm and historical spills from ASTs. Potential contaminants: Metals, PAH, TPH and ACM.	Estimated area cover is approximately 9.5% of the site near the northern border of Highbrook Drive. T&T (2011) and GSL (2019) investigation at the southern border of the road showed concentrations were below the applicable proposed land use criteria and no groundwater have been affected by soil contamination. T&T (2015) mentioned that extensive earthworks (19,000 m^3 of imported cleanfill and 3,000 m^3 of cut) was undertaken for proposed reshaping the northern border of the road which falls within the site. Based on the constituents of concern. soil impacts can be managed or remediated if encountered.	Low likelihood based on the investigations on nearby areas and earthworks undertaken on site for Highbrook Drive construction.
Area 4 – Former construction yard area (2004-2008)	Surficial soil contamination from stored material and hazardous substances. Potential contaminants: Metals, PAH, and TPH.	Estimated area covers approximately 10% of the total site area. Estimated period of this activity comprised 4 years (2004-2008) based on T&T 2015 report. Based on the constituents of concern, soil impacts can be managed or remediated if encountered.	Low likelihood considering the short period of exposure and legislative requirements on storage and handling of hazardous materials.

Area	Potential contaminants of concern	Commentary on potential soil impacts	Probability of exceedances in soil
Area 5 – Southern area (Fill Area B placed 2006)	Burn off area for domestic waste and dump area of Ōtāhuhu site for general and industrial waste and hardfill (T&T 2015). Potential contaminants: Metals, PAH, TPH, PCB, organochlorine pesticides (OCP), volatile organic compounds (VOC), semi-volatile organic compounds (SVOC) and ACM.	Estimated area cover is approximately 19.5% of the total site area. Investigations carried out by T&T 2011 in dump sites A and C nearby showed concentrations of contaminants detected below the applicable proposed land use criteria. Due to the public access made available to this dump area, there may be other constituents of concern not tested for in previous environmental assessments. Based on the constituents of concern, soil impacts can be managed or remediated if encountered.	Medium-low likelihood based on the nearby investigations and relatively recent (2006) use as dump site.

This table above shows that the five areas that have potentially impacted soil from previous site activities cover approximately half of the site area, however approximately 33% of the site area has medium or high likelihood to present soil contamination which may exceed the applicable human health and environment guidelines. These areas comprise of reclaimed land areas (Areas 1 and 2) near the Tamaki River bank and the Fill Area B (Area 5). It is anticipated that the other two areas (Areas 3 and 4) will have a low likelihood of encountering soil impacts above the applicable proposed land use criteria

In the event that soil impacts are encountered above the applicable proposed land use criteria, implementation of remediation/management practices can be adopted to remove or isolate those impacts. Therefore, based on the information reviewed, there are no known soil contaminant impacts that would impede land change use or development of the site as high-density residential use. The potential land remediation works can be completed at the land development phase, in accordance with the requirements of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011.

Yours sincerely

Tiago Teixeira
Chemical Engineer

Hiram Garcia
Principal Environmental Consultant

Babbage Consultants Limited

Attachments: Applicability and Limitations

Attachment 1 – Table A1 – Historical Aerial Photographs Review

Attachment 2 – Table A2 – Summary of Reviewed Investigation Reports

Appendix A – Historical Aerial Photographs

Appendix B – T&T 2011 and 2015 Records and Geoscience 2019 Records

APPLICABILITY AND LIMITATIONS

Restrictions of Intended Purpose

This report has been prepared solely for the benefit of Babbage Consultants Limited as our client with respect to the brief. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such party's sole risk.

Legal Interpretation

Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on they should be independently verified with appropriate legal advice.

Maps and Images

All maps, plans, and figures included in this report are indicative only and are not to be used or interpreted as engineering drafts. Do not scale any of the maps, plans or figures in this report. Any information shown here on maps, plans and figures should be independently verified on site before taking any action. Sources for map and plan compositions include LINZ Data and Map Services and local council GIS services. For further details regarding any maps, plans or figures in this report, please contact Babbage Consultants Limited.

Reliability of Investigation

Babbage has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

There is no investigation that is thorough enough to preclude the presence of materials at the site that presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may in the future become subject to different regulatory standards, which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

Table A1. Historical aerial photographs review.

Year	Site	Surrounds
1940	Pastoral land use.	Pastoral land use.
1958	Pastoral land use.	Pastoral land use. A road and bridge extending over Tamaki River is visible to the west. Electric pylons visible to the south-east.
1967	Construction of two ASTs and containment berm in progress on eastern portion. Reclamation activities on the north-eastern portion of the site, at the riverbank of Tamaki River.	Development of Ōtāhuhu power station to the east.
1969	Construction of ASTs and containment berm appear complete. Land reclamation observed in progress in the south-west portion of the site.	Continued development of Ōtāhuhu power station to the east. Large holding pond observed to the east of the ASTs.
1972	No significant changes observed.	Large holding pond appears to be dry.
1979	Reclamation in the south-western portion is complete and a barge dock appears to be present. A jetty appears to be constructed into the Tamaki River.	A second pond is visible to the south-east of the ASTs.
1980	Some stockpiled material is visible to the north-east of the rectangular feature in the southern area of the site.	No significant changes observed.
1988	North-eastern portion of the site appears to be used as a construction yard. The rectangular feature in the south-western corner of the site has been removed.	No significant changes observed.
1996	The construction yard in the north-eastern portion of the site appears to have been removed.	The second pond to the south-east of the ASTs is no longer visible.
2001	No significant changes at the site.	The Ōtāhuhu B power station has been constructed south-east of the site.

Year	Site	Surrounds
2003/2004	The ASTs have been removed although their footprints and containment berm are still visible. A roadway is visible from the ASTs leading south-west.	No significant changes observed.
2006	The eastern part of the site has been subject to earthworks associated with the construction of Highbrook Drive along the eastern site boundary. The north-eastern portion of the site appears to be being used as construction yard for the road works. The roadway though the centre of the site appears to have been widened and extended to the yard in the north and to a site access from the Southern Motorway in the south-west portion of the site. Soil/fill material appears to have been stockpiled in the south-western part of the site.	A stormwater pond has been constructed between the motorway and the site. Placement of fill appears to be ongoing to the east of the northern part of the site where the former AST containment area was. Construction works for the bridge over the Otara Creek are visible to the east of the site.
2008	Highbrook Drive has been completed and areas adjacent to the road converted to grass or plantings.	Electric pylon visible between motorway and the north-western corner of the site.
2010-2011	The construction yard in the northern part of the site appears to be gone. The south-western corner of the site appears to have been levelled and is grassed.	No significant changes observed.
2017	No significant changes on site.	A large area between Highbrook Drive and the power station has been cleared of vegetation, and hardfill placed for use as a vehicle parking area. Stockpiled material is visible between the Highbrook Drive and the pond.
2021	No significant changes on site.	The large pond to the east of the site has been partially drained and earthworks are occurring in this area. Hardstand area to the west of Ōtāhuhu B power station has increased.

Table A2. Summary of reviewed investigation reports.

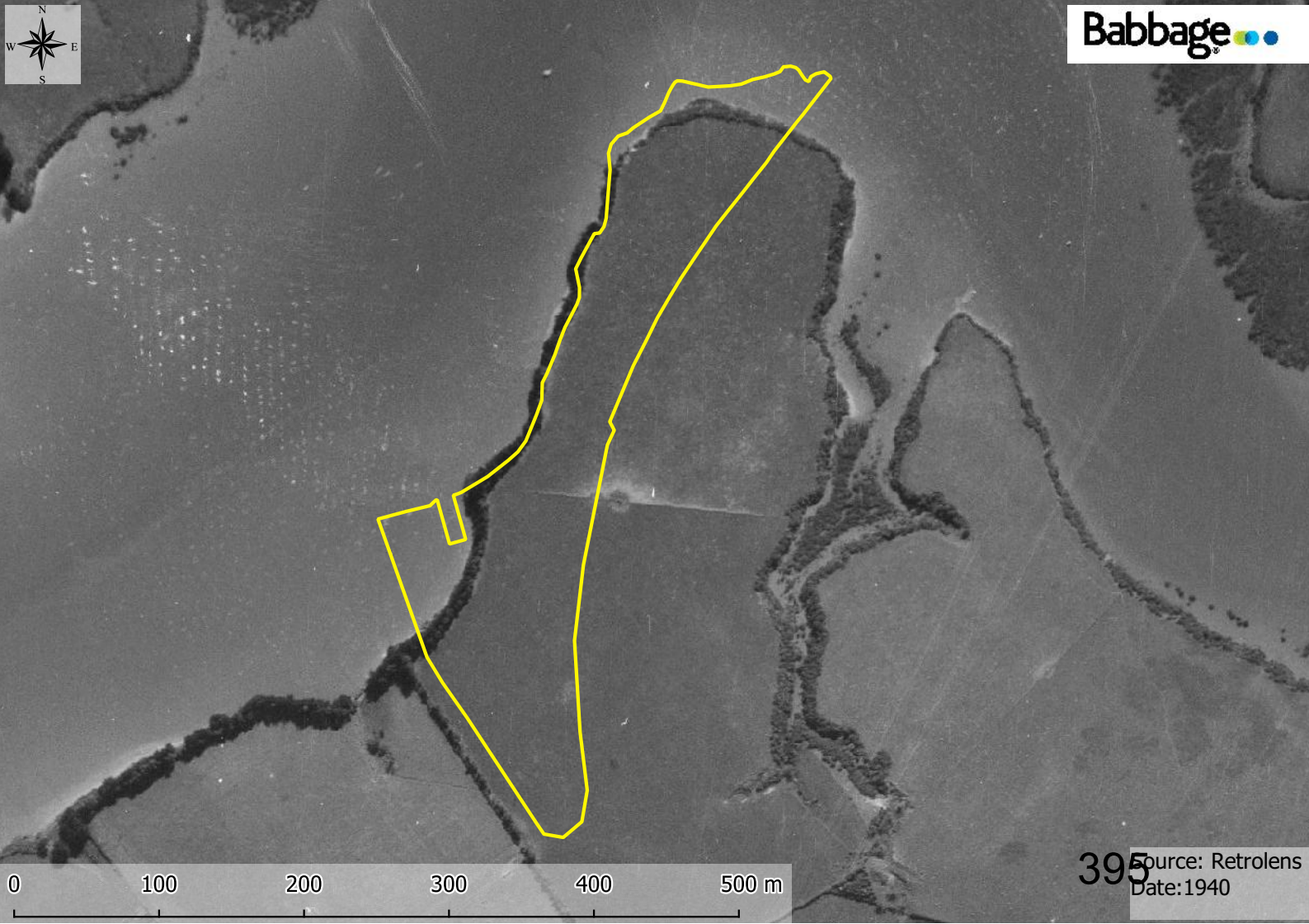
Tonkin & Taylor Ltd, 2015. Ground Contamination Desk Study, Ōtāhuhu Power Station. Job Number 31228.v2.2, Prepared for Contact Energy Ltd, October 2015.
T&T carried out this preliminary site investigation (PSI) for the whole 8-10 Sparky Road site. The investigation included a desktop study and a site visit. A summary of key findings is listed below. Site visit: • Potential asbestos material used in the reclamation area near the weir was observed during the site visit (north-eastern site corner, refer T&T Photograph A-61). • Ōtāhuhu Power station staff provided information relating to three historic fill areas located on the western portion of the site (Fill Area A, Fill Area B and Fill Area C), however just Area B is located at the southwestern portion of the site. This area was used as the burn-off area for the nearby village and the Ōtāhuhu site for general and industrial waste and hard fill. Refer Appendix B (Google Earth image of T&T Appendix B). Property file review in relation to site: • No consents prior to 1997. • Use of cleanfill material (19,000 m^3) over the former tank farm for road construction purposes (Highbrook Drive). Refer GHD earthworks drawing No. 51-19638-SK779 Rev B – 2005 Approval (Appendix B). • No recorded spill incidents for the site. T&T summarised soil investigation work carried out in August 2010 and reported in 2011 (T&T 2011). Refer to investigation area indicated on T&T Figures 3 and 4 in Appendix B. Selected soil samples were analysed for metals, TPH and PAH. Groundwater was collected from test pit TP2 and analysed for PAH and TPH. Excavations in the former tank farm area encountered fill comprising silt with minor sand and clay. A strong hydrocarbon odour was recorded in the fill material and groundwater at 2.5 m below ground level (m bgl) in the test pit TP2. Groundwater was encountered in the majority of the test pits approximately 0.5 to 1 mbgl. According to T&T, the majority of results are present below background values (non-volcanic) for metals, PAH and TPH. There are some concentrations of metals, pyrene and BAP equivalent that are present at levels above the published background, statistical analysis of these results indicates that following statistical analysis most elevated results fall below background for all contaminants except benzo(a)pyrene (BAP) equivalent. Laboratory results were below the NESCS SCS for residential land use 10% produce and for AUP PA criteria. Results of groundwater of TP2 show concentrations of PAH at or below both ANZECC 80% and 95% freshwater protection levels and total petroleum hydrocarbons were detected in all three ranges, but at relatively low levels (0.14 to 85 mg/l). According to T&T concentrations are low enough not to cause an ongoing

risk to either human health or the surrounding receiving environment. The 2011 investigation concluded that while fill across the site includes refuse in isolated areas, generally contaminant concentrations are relatively low and are below relevant human health and environmental criteria. Based on the data collected from the 2011 investigation contamination was not expected to present constraints on future commercial development of the investigated area of the site, with the exception of the cost of disposal of excavated materials to a managed or licenced landfill if they could not be reused on site. Table 6.1 of the T&T report indicated areas with potential for ground contamination the areas of reclamation and filling around the coastlines (former barge dock and weir); fuel and chemical storage area; and landfill sites.
Geosciences Ltd, 2018. Detailed Site Investigation (DSI), Former Ōtāhuhu Power Station, Investigation of Historic Tank Farm, Underground Storage Tank and Transformer Bay. Reference Number: Rep-1210a/DSI/Dec18/Rev1¸Prepared for Stonehill Property Trust, 31 December 2018, Revised 5 April 2019.
This DSI investigation scope areas were tank farm east of Ōtāhuhu A Power Station, underground storage tank and former transformer. The works carried out and key findings are described below: Tank farm: • Excavation of eight test pits followed by 10 analyses of soil for TPH, PAH and BTEX. Underground storage tank (UST): • Excavation of one test pit and collection of five soil samples for analysis of heavy metals, TPH, PAH and BTEX. Former transformer: • Collection of five surficial soil samples followed by analyses of four soil samples for heavy metals, TPH and PCB. The analytical results showed minor detection of PAH compounds (just one result of BAP in one sample for UST area). Remaining analytical results were within the expected naturally occurring background ranges for volcanic soils of the Auckland Region. GSL concludes that earthworks within the footprint of this area of former Ōtāhuhu Power Station are highly unlikely to present any risk to human health or the environment. Furthermore, no further specific remediation or management is required for within the piece of land covered under this investigation.

Geosciences Ltd, 2019. Contamination Assessment of Proposed Highbrook Drive Intersection Works. Reference Number: Ltr-1210c/Oct19, Prepared for NZ Storage Holdings Ltd, dated 18 October 2019.
GSL carried out an environmental assessment to investigate the soil quality of the area where has been proposed the construction of a new intersection on Highbrook Drive. The area of the proposed road intersection falls within the footprint of the former AST tank farm on the east side of the site. The first stage involved the excavation of 11 test pits with a total of 16 soil samples recovered (five of them composite samples) prior to the Highbrook Drive construction works. This investigation was reported as DSI addendum report (ref: Ltr-1210b-Jun19). The intrusive investigation works observed 1.0 m up to 2.5 m of mixed clay and hardfill highly compacted that likely, according to GSL, would extend the full extent of the earth bund. The analytical results showed that the concentrations were below the AUP PA criteria and NESCS SCS for residential land use 10% of produce (refer Appendix B). Some exceedances for volcanic background limits occurred for lead (three sample locations) and for petroleum hydrocarbons (traces of BAP was detected in eight sample locations and TPH C15-C36 in three sample locations). The second stage involved seven hand augers with seven soil samples recovered during the earthworks of the proposed development. Soil samples were recovered from depths of between 300 mm and 500 mm depth along the road verge. The soil was described as silty clay with abundant gravel inclusions and minor silty topsoil, refusal occurred in each hand auger hole due to gravel content. The analytical results returned with no exceedances of AUP PA criteria or NESCS SCS for residential land use 10% of produce (refer Appendix B). Exceedances of BAP were reported above the volcanic background limits. Based on these results, GSL concluded that *"the soil in the area of proposed earthworks is highly unlikely to present a risk to human health, or the environment."*

Appendix A

Historical Aerial Photographs


N
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Babbage
0
100
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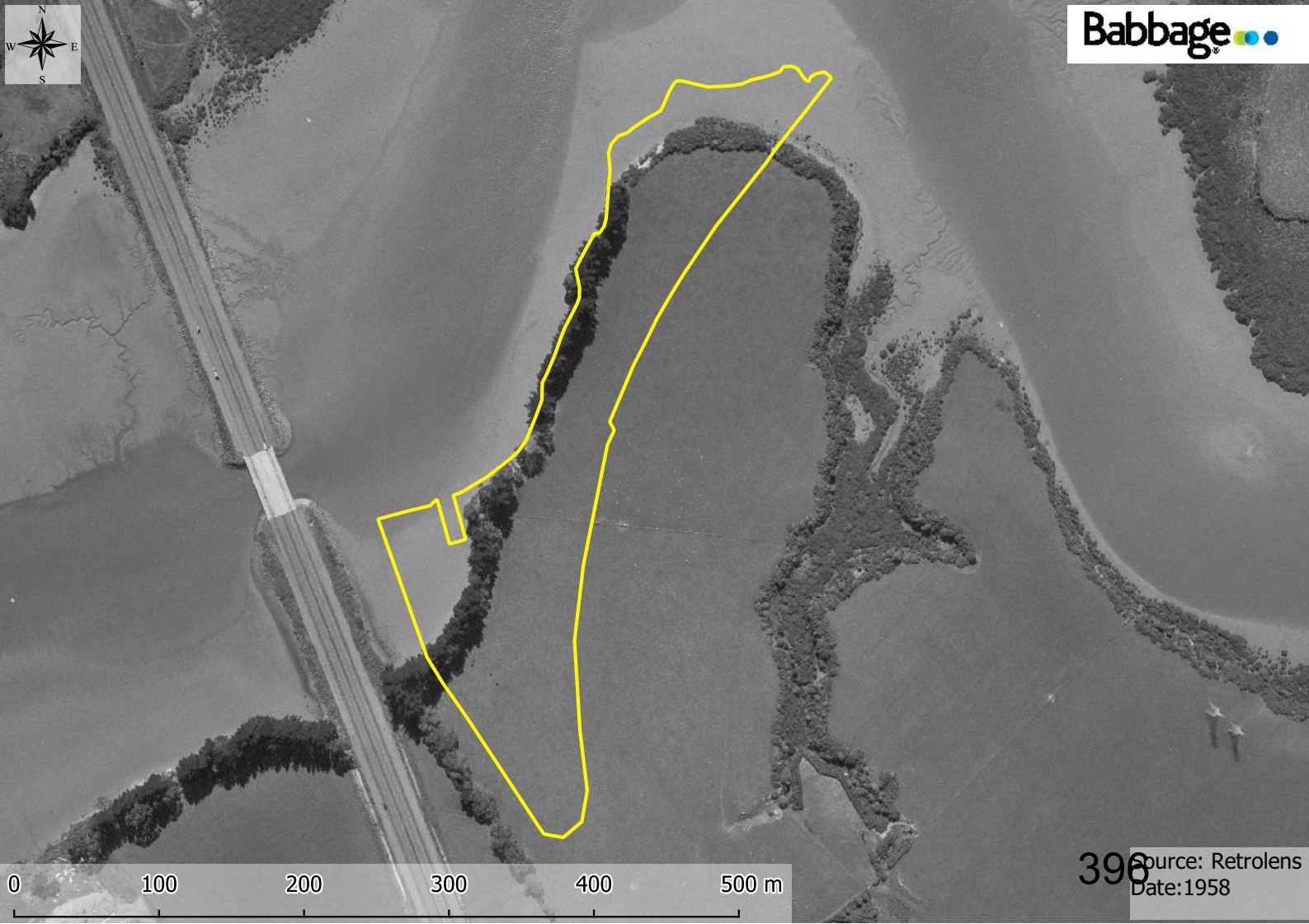
300
400
500 m
395
Source: Retrolens
Date:1940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396
Source: Retrolens
Date:1958


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Babbage
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500 m
397
Source: Retrolens
Date:1967


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398
Source: Retrolens
Date:1969


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399
Source: Retrolens
Date:1972

Babbage

400

Source: Retrolens
Date:1979


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Source: Retrolens
Date:1980


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Source: Retrolens
Date:1988


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408
Source: Geomaps
Date:2006


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Source: Geompas
Date: 2008


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408
Source: Geomaps
Date:2010-11


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409
Source: Geomaps
Date:2017


N
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Babbage
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500 m
Source: GoogleEarth
Date:2021

Appendix B

T&T 2011 and 2015 Records and Geoscience 2019 Records

Table C.1: Summary of 2010 soil results from the western portion of the site

Contaminants	Minimum	Maximum	Mean	95% UCL	NES Soil (Commercial/ Industrial)[1]	ALW/Unitary Plan Permitted Activity Criteria (Discharges)[2]
Metals						
Arsenic	3	19	5	6	70	100
Cadmium	<0.1	0.25	0.1	0.2	1,300	7.5
Chromium	11	67	34	39	6,300	400
Copper	3	43	22	25	240,000 [3]	325
Lead	12	70	25	30	3,300	250
Nickel	5	54	27	31	6,000 [3]	105
Zinc	21	125	59	70	400,000 [3]	400
PAH						
Naphthalene	<0.14	<0.17	-	-	210 [5]	16 (<1 m)[4] 270 (1-4 m)[4]
Pyrene	<0.03	0.25	-	-	-	NA[2]
B(a)P_{eq}.	<0.03	0.78	0.061	0.21	35	2.15
TPH						
C7-C9	<9	<12	-	-	500 [5]	500 (<1 m)[4] 500 (1-4 m)[4]
C10-C14	<20	<30	-	-	1,700 [5]	1,700 (<1 m)[4] 2,200 (1-4 m)[4]
C15-C36	<40	<50	-	-	NA [5]	NA[24]

Notes:

All values in mg/kg

NA indicates contaminant not limiting as estimated health based criterion is significantly higher than that likely to be encountered on site (i.e. 20,000 mg/kg for TPH, 10,000 mg/kg for other contaminants)

NC indicates 'Not Calculated' because all carcinogenic PAHs are below the laboratory limit of detection.

1 - MfE, April 2012. Users Guide: National Environmental Standard for assessing and managing contaminants in soil to protect Human Health (unless otherwise stated).

2 - ARP:ALW Permitted Activity Soil Criteria Schedule 10 - discharges (unless otherwise stated).

3 - National Environment Protection (Assessment of Site Contamination) Measure 1999 (Updated April 2013). Guideline on the Investigation Levels for Soil and Groundwater - Commercial/Industrial

4 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Sandy silt, GW Protection 2 m depth.

5 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Sandy silt, commercial/industrial use.

Table C.2: Summary of 2010 soil results from east of the tank farm

Contaminants	Minimum	Maximum	Mean	95% UCL	NES Soil (Commercial/ Industrial) [1]	ALW/Unitary Plan Permitted Activity Criteria (Discharges)[2]
PAH						
Naphthalene	<12	<17	-	-	210 [3]	16 (<1 m)[4] 270 (1-4 m)[4]
Pyrene	<0.03	0.04	-	-		NA[4]
$B(a)P_{eq}$.	NC	NC	-	-	35	2.15
TPH						
C7-C9	<8	<11	-	-	500 [3]	500 (<1 m)[4] 500 (1-4 m)[4]
C10-C14	<20	<30	-	-	1,700 [3]	1,700 (<1 m)[4] 2,200 (1-4 m)[4]
C15-C36	<40	<50	-	-	NA [3]	NA[4]

Notes:

All values in mg/kg

NA indicates contaminant not limiting as estimated health based criterion is significantly higher than that likely to be encountered on site (i.e. 20,000 mg/kg for TPH, 10,000 mg/kg for other contaminants)

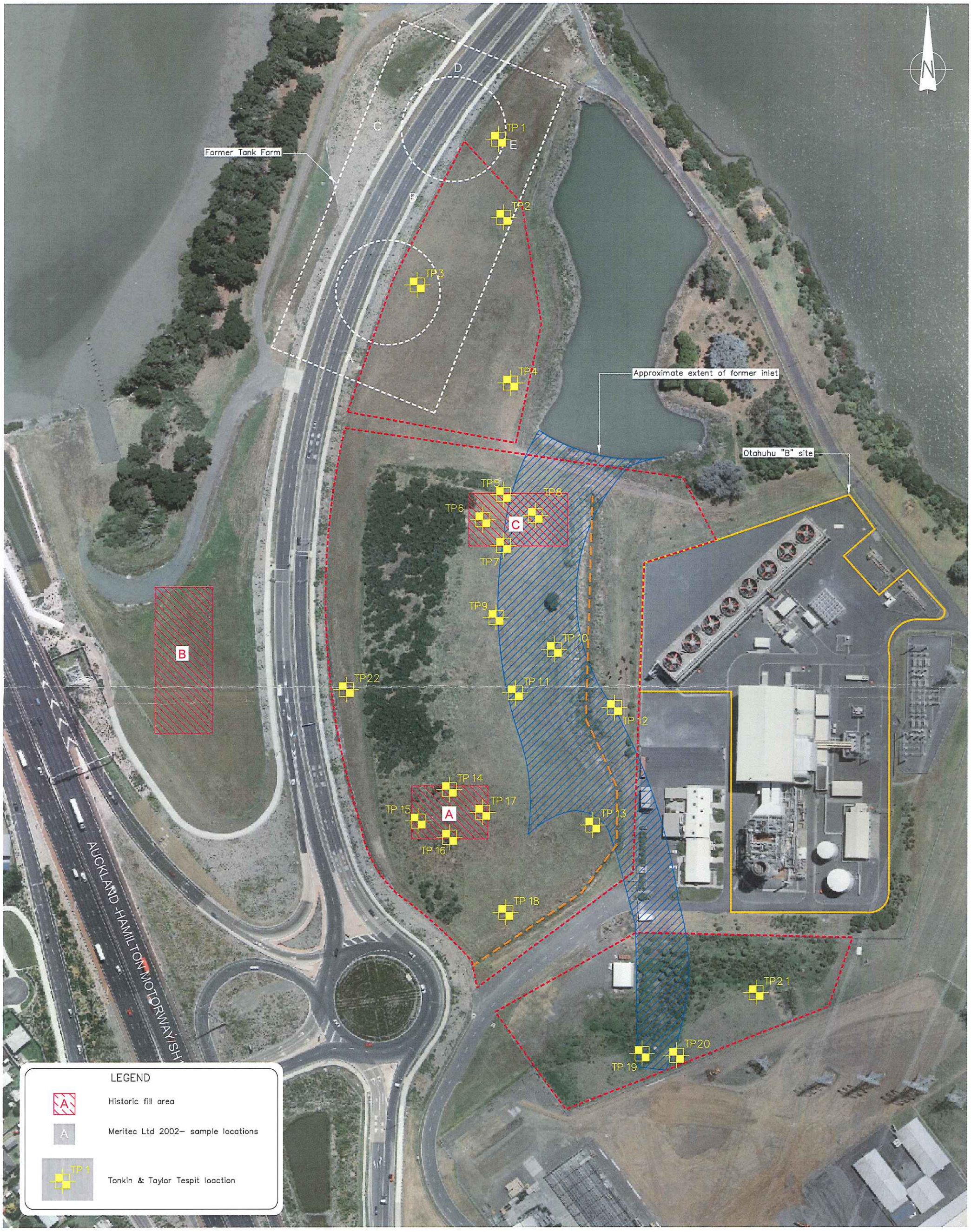
NC indicates 'Not Calculated' because all carcinogenic PAHs are below the laboratory limit of detection.

1 - MfE, April 2012. Users Guide: National Environmental Standard for assessing and managing contaminants in soil to protect Human Health (unless otherwise stated).

2 - ARP:ALW Permitted Activity Soil Criteria Schedule 10 - discharges (unless otherwise stated).

3 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Sandy silt, commercial/industrial use.

4 - MfE 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Sandy silt, GW Protection 2 m depth.



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Aerial photo sourced from Terralink International
(Copyright 2002–2005 Terralink International Limited and its licensors)

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Tonkin & Taylor
Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

DRAWN	BNRB	Sep.10
DRAFTING CHECKED		9/10
APPROVED		9/10
CADFILE : 85220.001–F3.dwg		
SCALES (AT A3 SIZE) 1: 2000		
PROJECT No. 58220.001		

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GROUND CONTAMINATION ASSESSMENT
PROPOSED TURBINE PLANT & TANK FARM
Site Investigation Plan

FIG. No. Figure 3 REV. 0

SCALE 1:500

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Aerial photo sourced from Terralink International (Copyright 2002–2005 Terralink International Limited and its licensors).

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	APPROVED	9/10
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CONTACT ENERGY LIMITED

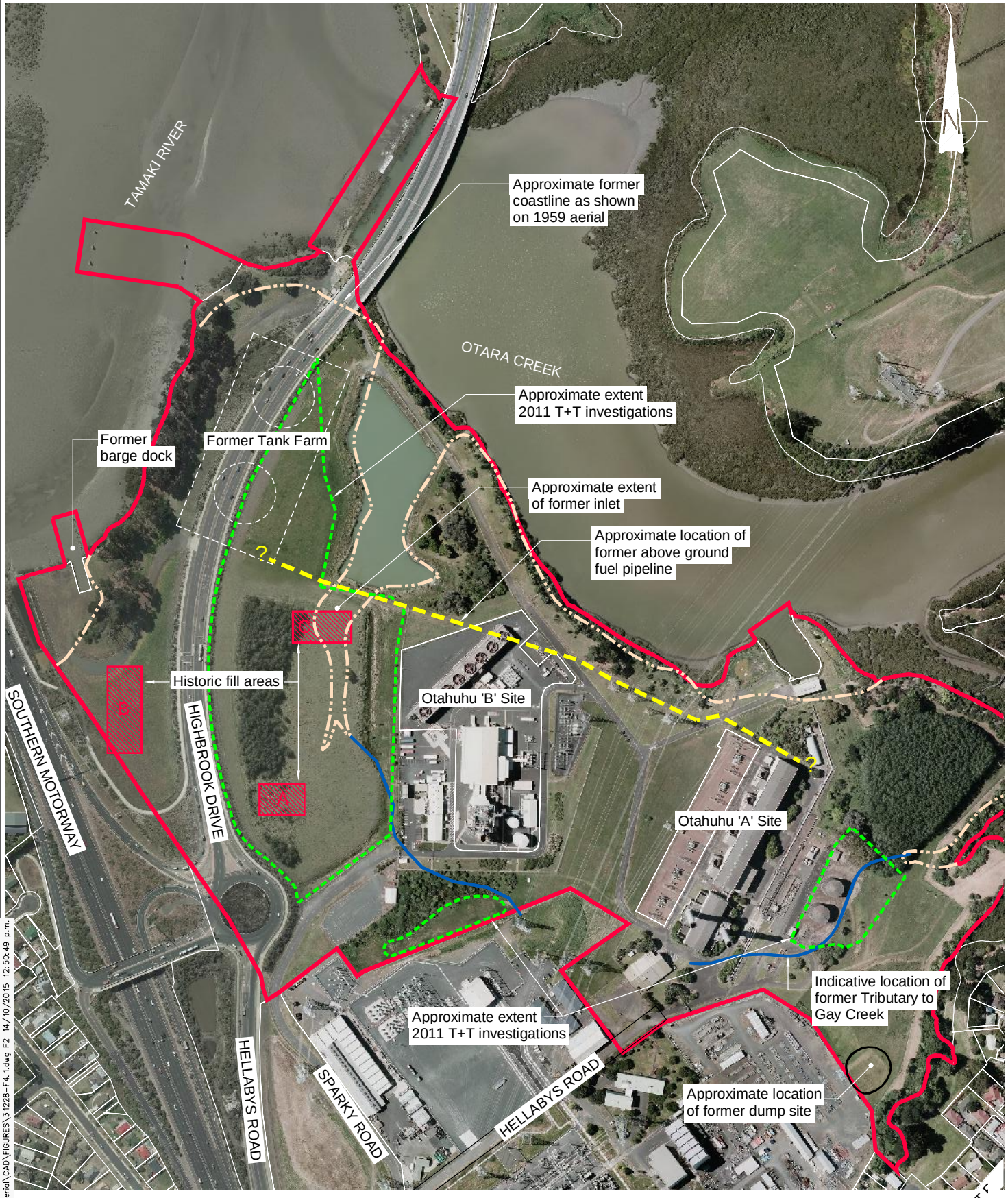
GROUND CONTAMINATION ASSESSMENT
PROPOSED TURBINE PLANT & NEW TANK FARM

Site Investigation plan

FIG. No. Figure 4

REV. 0


Otahuhu historic waste sites
Area A: Used as local rubbish dump for village and station general waste. Generally burnt off
Area B: Burn off area for Village and Otahuhu site general and industrial waste and hard fill.
Bulldozed off to right hand side
Area C: Excavation waste from A station erection earthworks
NOTE: Otahuhu site used to include what is now Transpower and Transfield areas
B
C
A
© 2008 MapData Sciences PtyLtd, PSMA
Image © 2008 DigitalGlobe
Google
Pointer 36°56'53.36" S 174°51'39.72" E elev 0 ft
Streaming 100%
Eye alt 2267 ft



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Aerial photo and property boundaries sourced from Auckland Council GIS Website

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PROJECT No. 31228		

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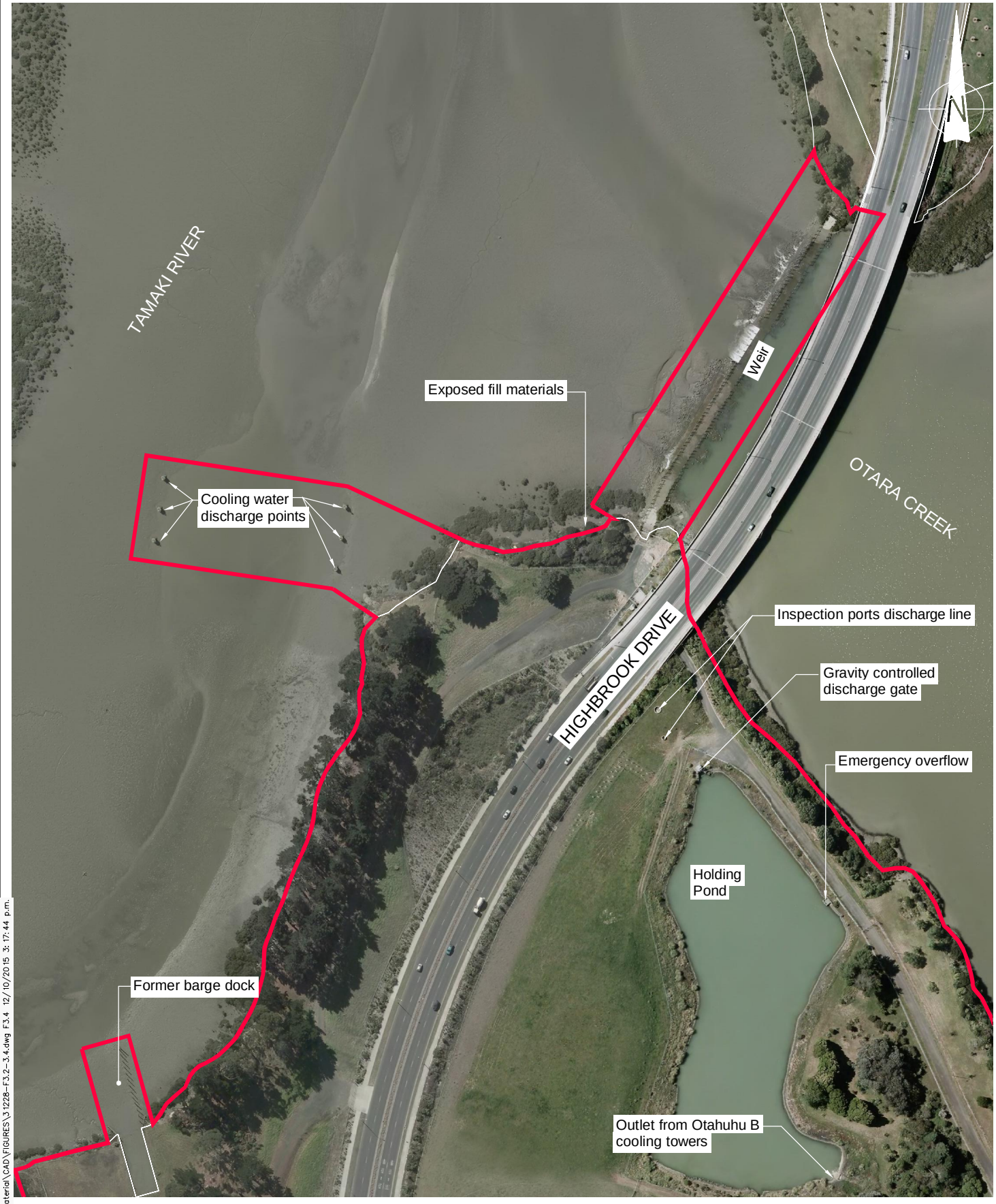
GROUND CONTAMINATION ASSESSMENT
SPARKY ROAD, OTARA

Historic Features

FIG. No. Figure 4.1

417

REV. 0



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Aerial photo and property boundaries sourced from Auckland Council GIS Website

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PROJECT No. 31228		

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GROUND CONTAMINATION ASSESSMENT
HELLABYS ROAD, OTARA

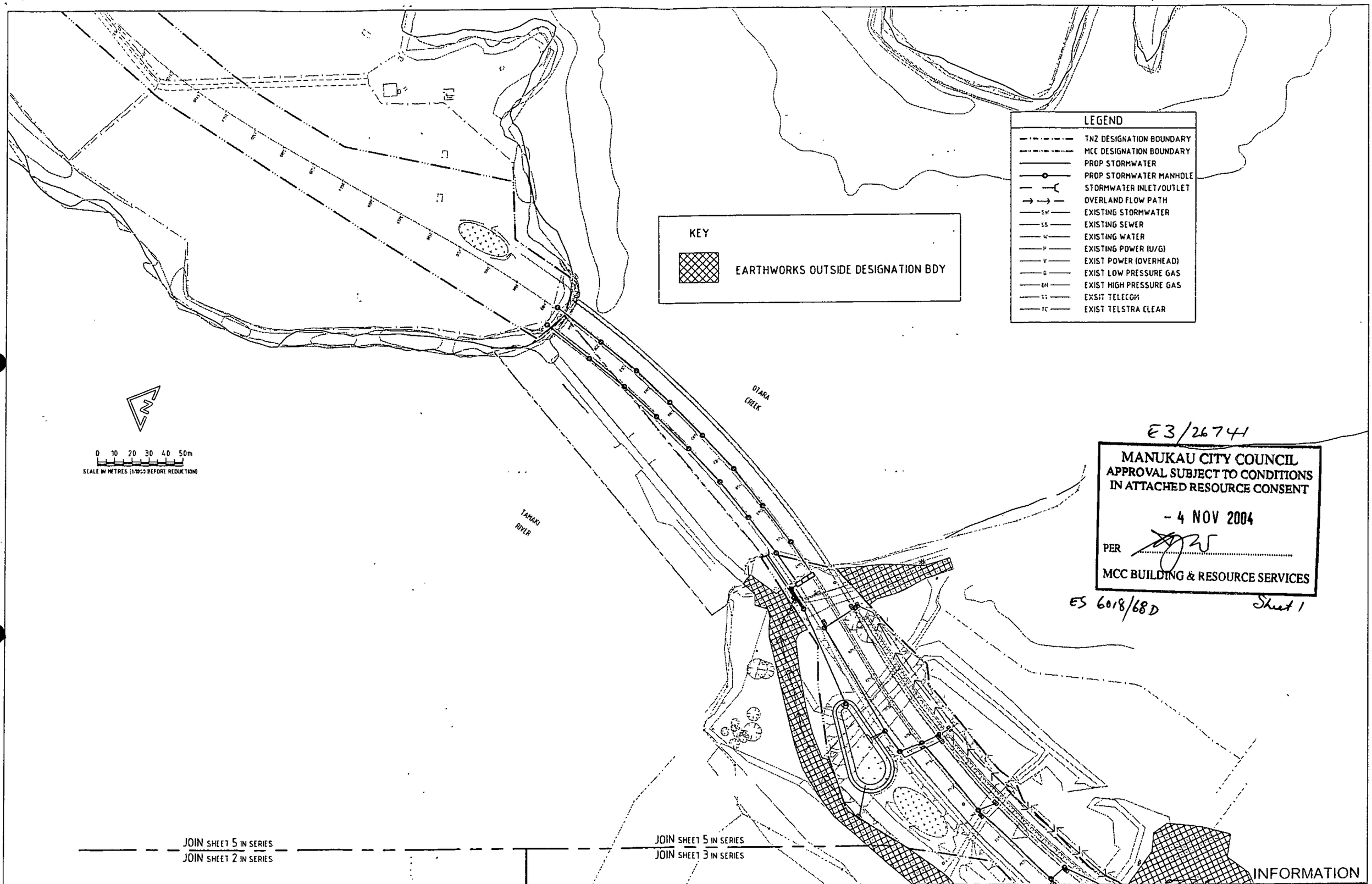
Site Features – Highbrook Drive Area

FIG. No. Figure 3.4

418

REV. 0

ALLOCATION PLANS



E3/26741

MANUKAU CITY COUNCIL
APPROVAL SUBJECT TO CONDITIONS IN ATTACHED RESOURCE CONSENT

- 4 NOV 2004

PER .....

MCC BUILDING & RESOURCE SERVICES

ES 6018/68D Sheet 1

INFORMATION

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
A	INFORMATION	SK			

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Auckland, 1702
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E aucmail@ghd.co.nz www.ghd.co.nz

Scale 1:1000 @A1	DO NOT SCALE	Client	MANUKAU CITY COUNCIL
Drawn SK_07/04	Designed	Project	WAIOURU PENINSULA TO SH1 CONNECTION
Drafting Check	Design Check	Title	EARTHWORKS AREAS OUTSIDE DESIGNATION 3 OF 3
Approved		Original Size	A1
Date		Drawing No:	51-19638-SK3419
This Drawing must not be used for Construction unless signed as Approved		Rev:	A

JOIN SHEET 5 IN SERIES
JOIN SHEET 3 IN SERIES

JOIN SHEET 2 IN SERIES
JOIN SHEET 3 IN SERIES

KEY

EARTHWORKS OUTSIDE DESIGNATION BDY

TAMAKI RIVER

P4

PUTNEY WAY

LEGEND

- TNZ DESIGNATION BOUNDARY
- MCC DESIGNATION BOUNDARY
- PROP STORMWATER
- PROP STORMWATER MANHOLE
- STORMWATER INLET/OUTLET
- OVERLAND FLOW PATH
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING WATER
- EXISTING POWER (U/G)
- EXIST POWER (OVERHEAD)
- EXIST LOW PRESSURE GAS
- EXIST HIGH PRESSURE GAS
- EXSIT TELECOM
- EXIST TELSTRA CLEAR

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SCALE IN METRES (1:1000 BEFORE REDUCTION)

E3/26741

MANUKAU CITY COUNCIL
APPROVAL SUBJECT TO CONDITIONS IN ATTACHED RESOURCE CONSENT
- 4 NOV 2004
PER
BUILDING & RESOURCE SERVICES

ES 6018/68D

Sheet 2

WYMONDLEY ROAD

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LL= 7.64

JOIN SHEET 3 IN SERIES
JOIN SHEET 4 IN SERIES

INFORMATION

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Drafting Check		Design Check	
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Date			

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Project: WAIOURU PENINSULA TO SH1 CONNECTION
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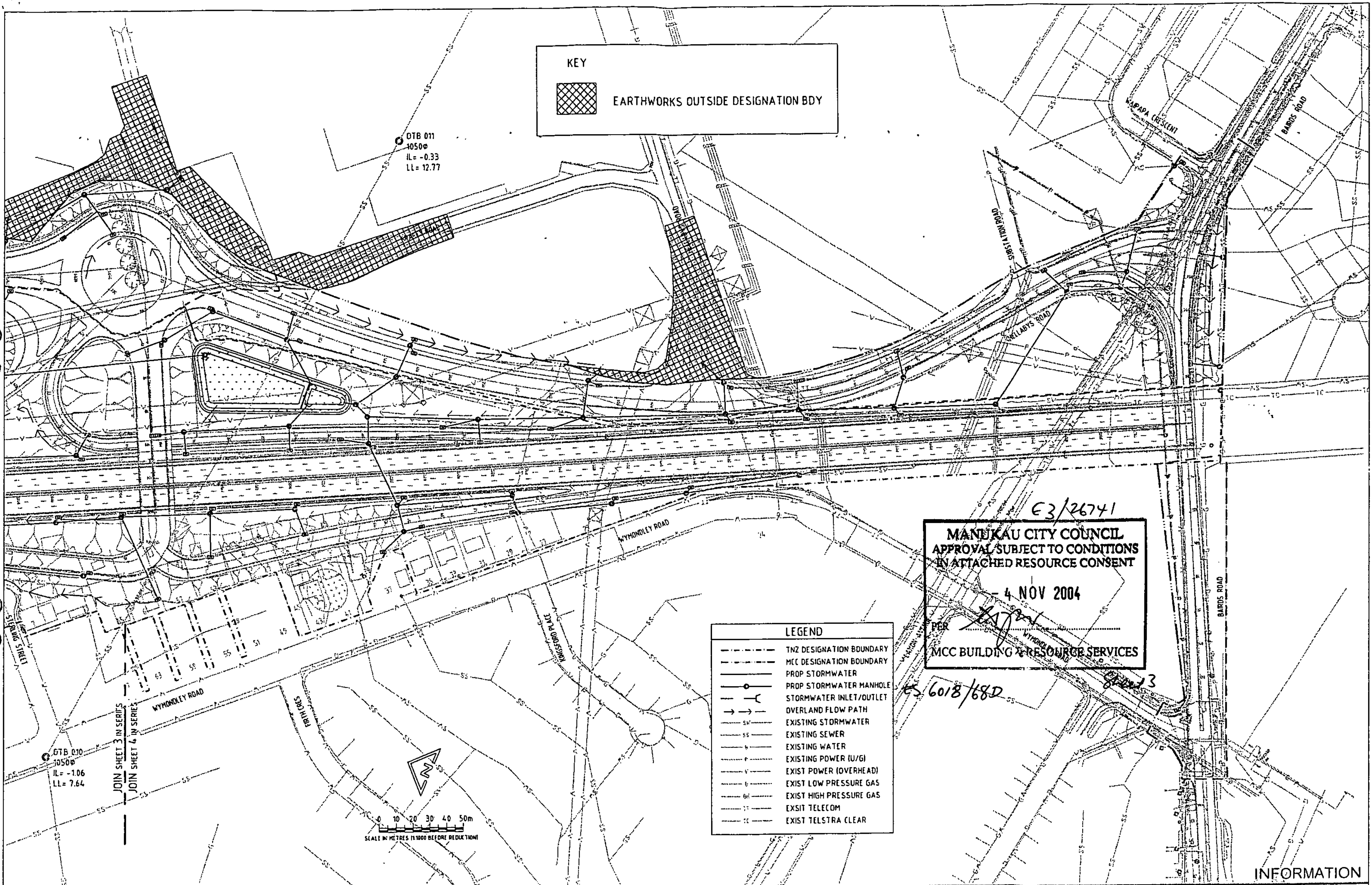
Drawing No: 51-19638-SK420
Rev: A



INFORMATION

No	Revision	Drawn	Checked	Approved	Date
A	INFORMATION	SK			

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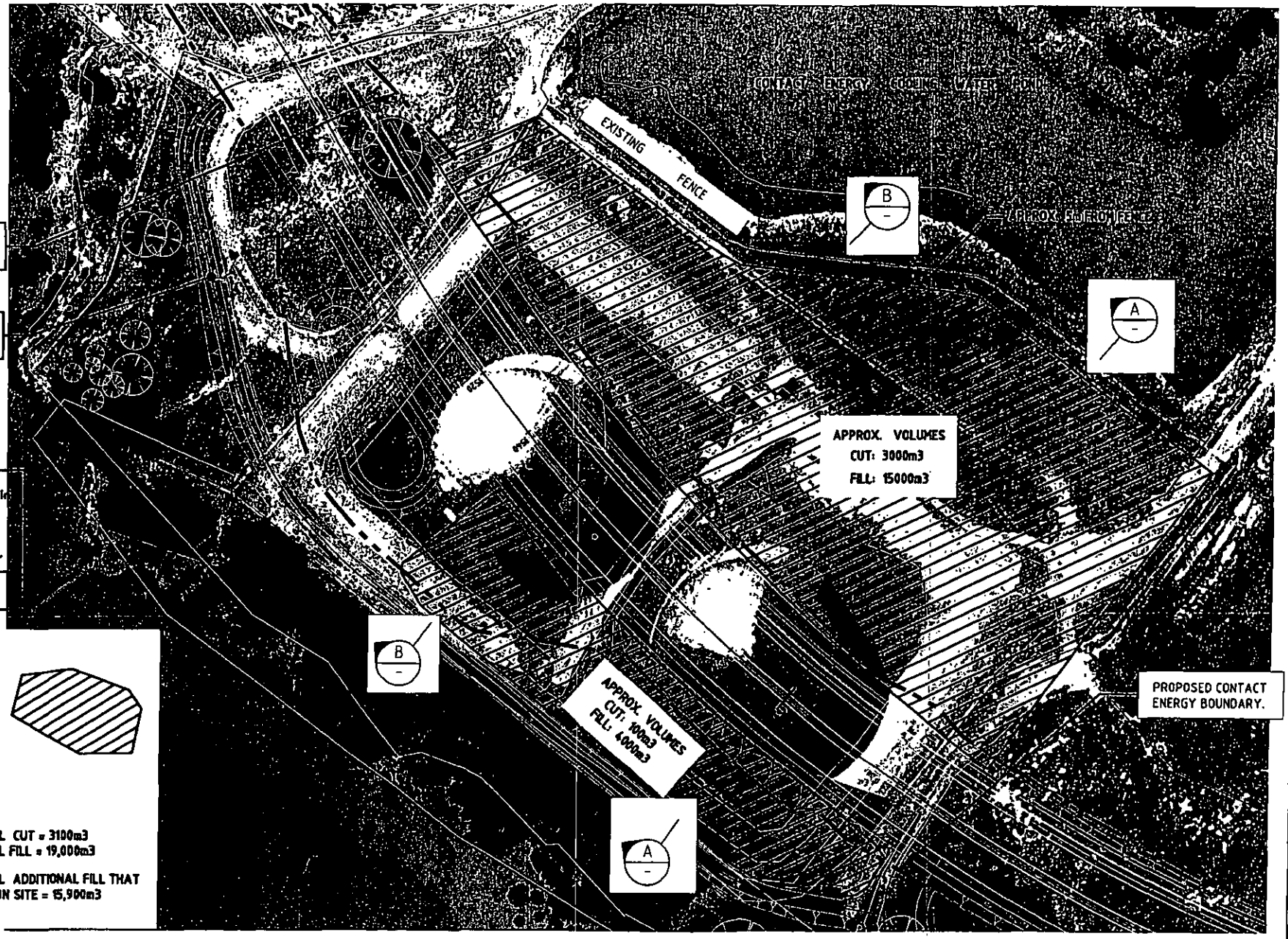
Client MANUKAU CITY COUNCIL
Project WAIOURU PENINSULA TO SH1 CONNECTION
Title EARTHWORKS AREAS OUTSIDE DESIGNATION 2 OF 3
Original Size A1
Drawing No: 51-19638-SK
Rev: A



E3/29494

Manukau City Council
Approval Subject to Conditions in attached Resource Consent

11 JAN 2005

Howard Wright
Proposal No 29494
Sheet 1

PROPOSED RESHAPING AND DISPOSAL OF UNSUITABLE MATERIAL AREA.

SUMMARY:

APPROX. TOTAL CUT = 3100m3
APPROX. TOTAL FILL = 19,000m3

APPROX. TOTAL ADDITIONAL FILL THAT CAN BE LOST ON SITE = 15,900m3

INFORMATION

Rev	Revision	Drawn	Checked	Approved	Date
B	ISSUED FOR INFORMATION (PREVIOUS REV RENAMED 0 TO A)	BK			11/05
A	INFORMATION	JTT			09/05

MANUKAU City Council

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Drafting Check	Design Check
Approved	
Date	21/09/2005

Client: MANUKAU CITY COUNCIL
Project: WAIOURU PENINSULA TO SH1 CONNECTION
Title: GENERAL LAYOUT PLAN PROPOSED FILL AREAS
Original Size: A1
Drawing No: 51-19638-SK779
Rev: B

Table 1: Diesel Storage Tanks / Tank Farm[1] & Stockpile (Geosciences 2019, amended by Babbage 2022)

	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	BaP	C15-C36
SS91	1.89	0.022	8.35	13	14.9	10.3	21.7	<0.01	<25
SS92	4.4	0.086	25.7	22.6	30.2	27.3	54.5	**0.02**	**31**
SS93	11.1	0.26	38.6	53.6	**85.4**	56.5	118	**0.89**	**98**
SS94	2.6	0.033	18.2	12.5	19.1	16.5	21.5	<0.01	<25
SS95	6.95	0.1	33.3	31.7	39	40.3	67.7	**0.04**	**54**
SS96	5.17	0.084	32.4	27.9	28.5	42.3	63.6	**0.05**	<25
SS97	4.38	0.046	47.4	31.2	22.4	46.4	41.9	<0.01	<25
SS98	8.4	0.32	60	41.1	**69**	45.2	114	<0.01	-
SS99	9.2	0.19	34.9	42.3	**83.5**	45.4	101	**0.35**	-
SS91-Comp	4.75	0.099	29	21	22.3	25.2	70.4	**0.01**	-
SS92-Comp	4.8	0.11	35	24.6	23.3	37.7	101	**0.02**	-
SS93-Comp	4.81	0.18	52.4	30.3	32.2	45.6	88.2	**0.05**	-
SS94-Comp	4.38	0.22	69.2	27.6	18.8	52.3	93.8	**0.04**	-
SS95-Comp	3.01	0.26	92.1	31.2	12.7	76	92.4	<0.01	-
SS100	7.51	0.094	20.1	18	20.1	18.1	31.1	<0.01	-
SS101	6.57	0.15	38.5	32.6	30.3	48.6	82	**0.06**	-
NES[3]	70	1,300	6,300	>10,000	3,300	NL	NL	35	>20,000
AUP(OP)[4]	100	7.5	400	325	250	105	400	20	>20,000
Background[5]	0.4-12	<0.1-0.65	3-125	20-90	<5-65	4-320	54-1,160	ND	ND
High Density Residential NES[9]	**45**	**230**	**1,500**	**>10,000**	**500**	**NL**	**NL**	**24**	**>20,000**
10% Produce Residential NES[9]	**20**	**3**	**460**	**>10,000**	**210**	**NL**	**NL**	**10**	**>20,000**

Notes:

1. All concentrations measured in mg/kg
2. National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health - Commercial / industrial outdoor worker (unpaved)
3. Auckland Unitary Plan (Operative in Part) - Table E.30.6.1.4.1 permitted activity soil acceptance criteria
4. Auckland Regional Council Technical Publication No. 193
5. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Tier 1 soil acceptance criteria for commercial / industrial use, surface soil (<1m) in silty clay soils for C15-C36 fraction
6. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Tier 1 soil acceptance criteria for protection of groundwater, surface soil (<1m) with groundwater at 2m, silty clay soils for C15-C36 fraction
7. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the AUP(OP) criteria, values in **BOLD** exceed the background ranges
8. NA = Not applicable / NL = No limit / ND = Not detected
9. MfE, April 2012. Users Guide: National Environmental Standard for assessing and managing contaminants in soil to protect Human Health.

Table 2: Analytical Results [1] (Geosciences 2019, amended by Babbage 2022)

	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	BaP[5]
HIghbrook-1	6.4	<0.4	23	15	23	8.3	52	**0.1107**
Highbrook-2	8.1	<0.4	76	35	22	27	170	ND
Highbrook-3	5.3	<0.4	22	21	29	27	43	**0.3194**
Highbrook-4	9.3	<0.4	57	26	25	19	140	ND
Highbrook-5	6.7	<0.4	31	17	28	17	49	**0.0489**
Highbrook-6	7.1	<0.4	23	19	31	17	49	**0.4242**
Highbrook-7	11	<0.4	25	27	46	22	69	**0.3466**
NES[2]	70	1,300	6,300	>10,000	3,300	NL	NL	35
AUP(OP)[3]	100	7.5	400	325	250	105	400	20
Background[4]	12	<0.1-0.65	3-125	20-90	<5-65	4-320	54-1,160	ND
High Density Residential NES[9]	**45**	**230**	**1,500**	**>10,000**	**500**	**NL**	**NL**	**24**
10% Produce Residential NES[9]	**20**	**3**	**460**	**>10,000**	**210**	**NL**	**NL**	**10**

Notes:

1. All Concentrations measured in mg/kg
2. National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health - Commercial / industrial outdoor worker (unpaved)
3. Auckland Unitary Plan (Operative in Part) - Table E.30.6.1.4.1 Permitted activity soil acceptance criteria
4. Auckland Regional Council Technical Publication No. 153 - Background concentration ranges for inorganic elements in volcanic soils in the Auckland Region
5. For Benzo(a)pyrene, the equivalent BaP concentration is calculated as the sum of each of the detected nine carcinogenic PAHs, multiplied by their respective potency equivalency factors as per Table 40 of *The Methodology*
6. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the AUP(OP) criteria, values in **BOLD** exceed the background ranges
7. ND = not detected, NL = no limit set
8. MfE, April 2012. Users Guide: National Environmental Standard for assessing and managing contaminants in soil to protect Human Health.

Memorandum

Bioresearches
A Babbage Company

To:	**Highbrook Living Limited**	**Date:**	19 July 2022
Attention:	c/- Sukhi Singh Babbage Consultants Limited	**Ref:**	64872
Subject:	**Highbrook Private Plan Change Request: Ecological Assessment**		

Highbrook Living Limited is investigating the feasibility of a Private Plan Change Request to the Auckland Unitary Plan (Operative in Part) for part of their site at 8 Sparky Road, Highbrook (refer Figure 1). The site adjoins the Highbrook SH1 off ramp and Highbrook Drive in the Highbrook industrial area, refer Figure 1). The site is currently zoned Business - Light Industry, and the proposal is to change the zoning to allow for residential uses.

This memorandum provides an assessment of the ecology of the site, following desk top assessments and a site visit on 24 February 2022, and comments on the potential effects on ecology of the change in zoning.

The site is located between Highbrook Drive and the Tāmaki Estuary, with State Highway 1 Motorway to the west and the Tāmaki Estuary to the east (Figure 1).

Figure 1. Proposed Highbrook Plan Change area.

There are no Natural Resources overlays over the site, specifically there are no Significant Ecological Area overlays, either Terrestrial or Marine; and there are no notable trees on the site (Auckland Council GeoMaps). The current biodiversity layer does not show any specific ecosystem types on the site.

Bioresearches
68 Beach Road, Auckland 1010
P O Box 2027, Auckland 1140
T 09 379-9417
Website: www.Bioresearches.co.nz

The Stormwater Management Plan confirms that there are no overland flow paths entering the site from neighbouring land. The Stormwater Management Plan confirms there are two overland flow paths that start within the site. They are:

1. The overland flow path along the table drains of the gravel road.
2. The overland flow path in the southern part of the site that drains to the NZTA stormwater pond.

The major overland flow path shown in the Auckland Council Geomaps runs into the site at the northern end from Highbrook Drive and the water-cooling pond to the east of Highbrook Drive does not flow through the site. It flows along the service lane parallel to Highbrook Drive that leads to the box culvert underpass.

Historic aerials (Auckland Council GeoMaps, Retrolense) illustrate that the site was cleared of all vegetation for farming except for a small amount of coastal fringe vegetation (1940, 1959, 1960); and then further modified with the addition (1967) and removal (between 2001 and 2003) of power generation plant and access roads; then the construction of Highbrook Drive (2006) and subsequent landscape planting.

The vegetation on the site is currently a mix of rank grass, native plantings (flax, five finger, pōhutukawa, pūriri, cabbage tree, karo, black matipo, shining karamū, kānuka), exotic trees (macrocarpa, poplar, pine) and exotic weed species (tree privet, pampas, wattle, gorse, woolly nightshade), transitioning to mangroves in the Coastal Marine Area (CMA). Although the area of native plantings near the coast are now well established, they are comprised of common native species, and area strongly influenced by weed species.

Figure 2. Established native and exotic vegetation in the centre of the site (near Highbrook Drive), mix of grasses, pine, gorse mixed with native species, flax, Hebe, kānuka, karamu.

Figure 3. Centre of the site adjacent to Highbrook Drive (photo left) vegetation dominated by exotic kikuyu grass and gorse with occasional native shrub.

Figure 4. Vegetation in the coastal yard – mix of grass, exotic weeds and native plantings.

The vegetation in the transition area between the land and into the CMA is dominated by mangroves with patches of glasswort, buck's horn plantain and occasional salt-marsh ribbon wood.

Figure 5. Western area of the site near State Highway 1 - kikuyu grass transitioning to glasswort and mangroves in the CMA.

Although changing the zoning from Industrial to residential will result in a technical reduction in the coastal yard from 25m to 10m, it will not result in any material differences to the retention of vegetation, and has the potential for improvement in the short term with the establishment of a 20m Esplanade Reserve and in the long term as a residential amenity. Under both zonings vegetation in the centre of the site will need to be removed to allow for future development. Under the residential development scenario, with subdivision, an Esplanade Reserve will provide public access and amenity, with ongoing maintenance of the coastal vegetation. In addition, residential development offers greater opportunities for plantings, maintenance and enhancement of the main part of the site, as well as the coastal area.

With the exception of notified pest plants, vegetation alteration or removal of greater than 25m² of contiguous vegetation or tree alteration or tree removal of any indigenous tree over 3m in height within 20m of mean high water springs is a restricted discretionary activity. This applies to both the current zoning and proposed zoning for future urban use.

The habitats in the Coastal Marine Zone would be improved with the removal of pest plants, control of pest animals, infill planting and enrichment plantings. Opportunities also exist for the enhancement of the coastal fringe vegetation at transition from the land to CMA with planting with sea rushes (*Juncus kraussi, Apodasmia similis)* and herbaceous salt marsh plants (*Samolus repens, Cotula coronopifolia*), increasing the width of the native vegetation and increasing the connectivity between the sea and land, as well as along the coastal fringe.

Within the CMA on the northern boundary of the proposed plan change area a weir is present at the mouth of the Otara Creek where it flows to the Tāmaki Estuary. Although the weir is immediately adjacent to Highbrook Drive, a major arterial road connecting to State Highway 1, it is used for roosting by a number of coastal bird species.

Figure 6. Structure used for roosting birds on Otara Creek Weir (photo left) and proximity to Highbrook Drive.

Bird surveys between 2016 and 2022 (eBird) of the birds utilising the weir identified 16 native or endemic coastal bird species (Table 1).

Table 1. Native Coastal Bird Species recorded from the Otara Creek Weir (eBird 2016 – 2022).

Common name	Scientific name
Black-billed Gull	*Chroicocephalus bulleri*
Silver Gull (Red-billed)	*Chroicocephalus novaehollandiae scopulinus*
White-fronted Tern	*Sterna striata*
Caspian Tern	*Hydroprogne caspia*
Southern Black Backed Gull	*Larus dominicanus*
Little Pied Shag	*Microcarbo melanoleucos*
Little Black Shag	*Phalacrocorax sulcirostris*
Pied Shag	*Phalacrocorax varius*
South Island Pied Oystercatcher (SIPO)	*Haematopus finschi*
Variable Oystercatcher	*Haematopus unicolor*
Pied Stilt	*Himantopus leucocephalus*
New Zealand Dotterel	*Charadrius obscurus*
Bar-tailed Godwit	*Limosa lapponica*
White-faced Heron	*Egretta novaehollandiae*
Sacred Kingfisher	*Todiramphus sanctus*
Pūkeko	*Porphyrio melanotus*

All of these coastal bird species are commonly or seasonally recorded throughout the Tāmaki River estuary and wider environment, and when utilising the weir and surrounds have acclimatised to the variable and high levels of noise and movement generated by the roadway. The proposed plan change will result in increased use and access to the coastal area by the public but the structures are isolated and separated by water at high tide when the birds are roosting, and the birds utilising them habituated to variable noise levels and disturbance.

The vesting of an Esplanade Reserve in the future, with the increase in community participation will provide a strong incentive for the enhancement of the area, with pest plant and pest animal management, replacement plantings and enhancement, and community involvement will ensure the future of the reserve as a coastal vegetation zone with access to the Tāmaki Estuary.

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Treffery Barnett M.Sc. (Hons), MEIANZ
Senior Coastal & Freshwater Ecologist

Bioresearches
A Babbage Company

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Babbage Consultants Limited
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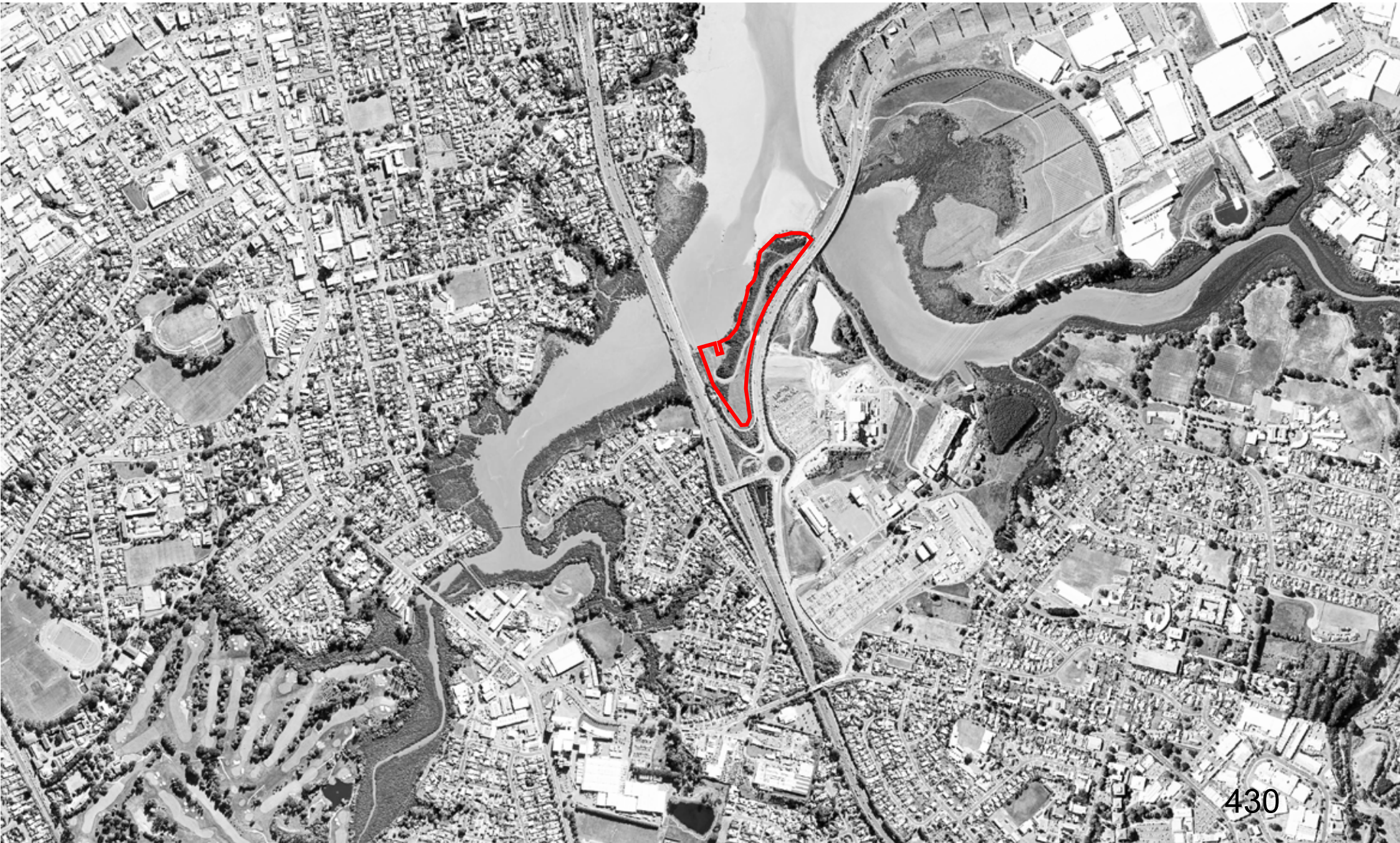


Content

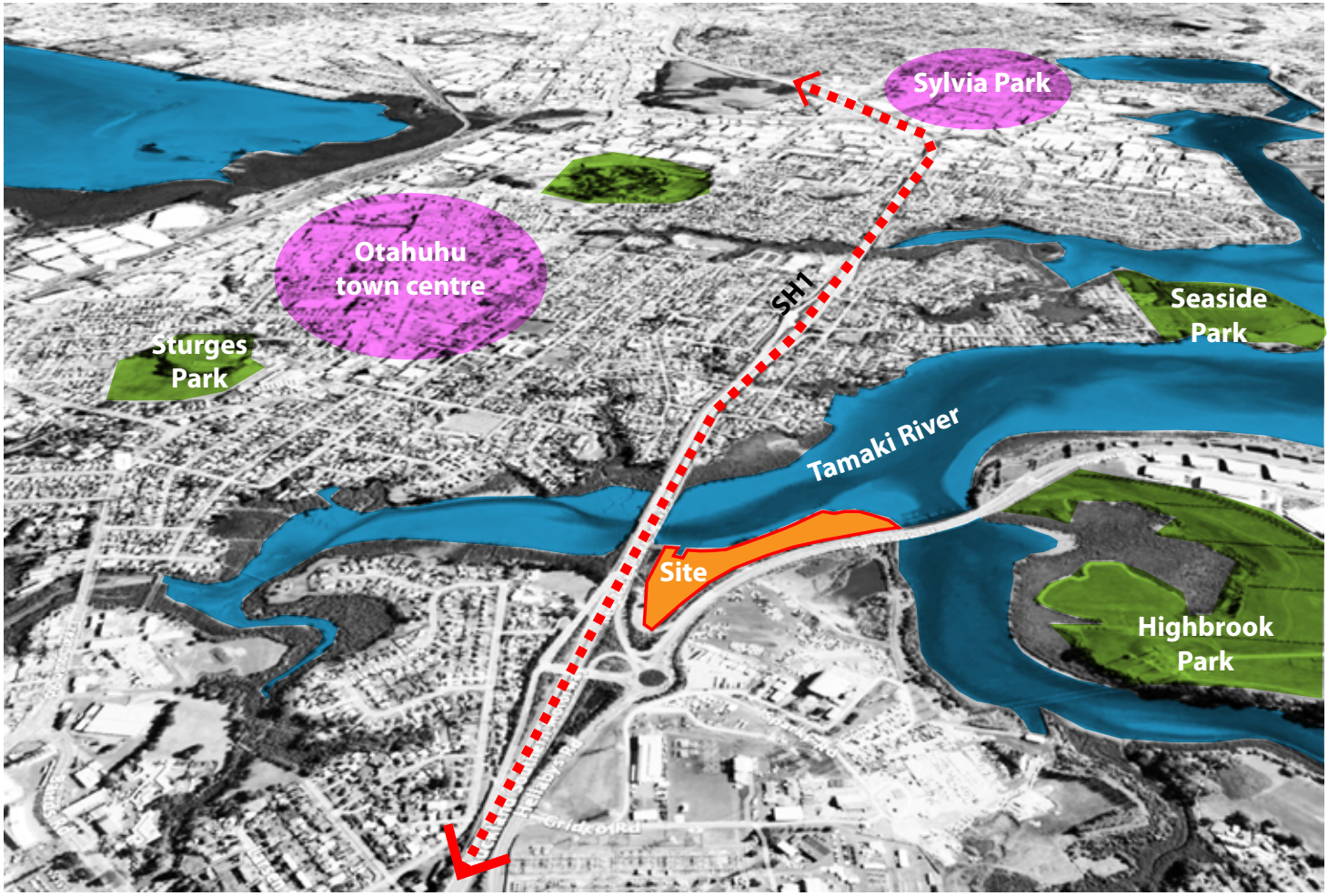
This report is prepared for Highbrook Living Ltd for Highbrook Private Plan Change Request.

1.0 Introduction & scope

1.1 Highbrook Living will be a new residential neighbourhood offering a range of living opportunities in strategic location. Positioned on the Tamaki River and with convenient transport connections to State Highway 1 together with the centres of Otahuhu and Otara the community will have excellent access to social, cultural and environmental amenities.

1.2 This document lays out the concept master plan vision and key design moves for the project, expressed through a series of principles, precedents and site mapping.

1.3 This document captures the design thinking to date within a draft Concept Master Plan that provides the basis for the proposed private plan change to rezone the present Business Light Industry Zone to Terraced Housing Apartment Building zone (THAB).



Right: Aerial image showing site in context.

2.0 Site analysis

2.1 The site is located approximately 2km from Otara town centre and 3.5km from Otahuhu town centre. The site is a residual foreshore parcel from the construction of Highbrook Drive and enjoys open water views to the north and west across the Tamaki River.

2.2 The foreshore presently comprises mature vegetation and areas of mangrove. Man made structures include a dock and remnants of piles to a wharf structure located in the west part of site adjacent to the motorway. A further much larger wharf structure existed in the northern part of the site but all that remains now are the piles defining the river channel.

2.3 Vehicle access to the site is from Highbrook Drive with the private road branching north and south on entry to the site. A shared path defines the east and south edge of the site and connects to the route heading north across the Tamaki River.

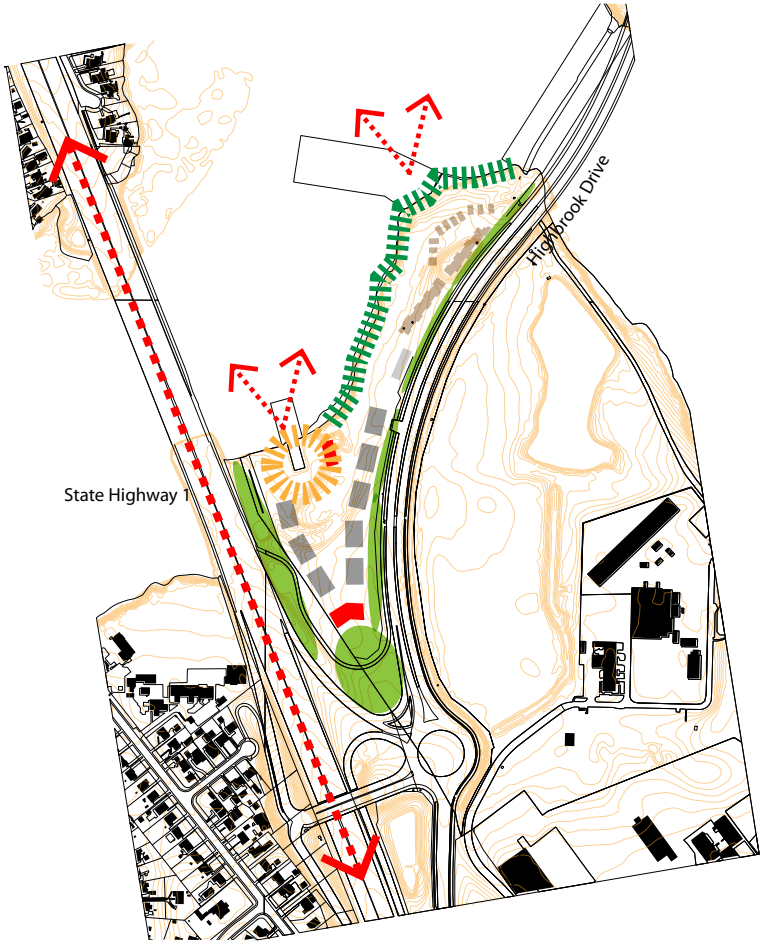
2.4 The site is largely unaffected by significant overland flow paths but does feature an area of identified flood plain in the north east part of the site. There exists a further area identified as susceptible to coastal inundation to the south west portion surrounding the dock structure.

2.5 The site is presently zoned Business Light Industry and forms a part of the broader zoning capturing the sizeable areas of industrial land east of Highbrook Drive. The site character in terms of coastal location, topographic and other constraints mean the site is not best suited to large footprint buildings and is better planned for with smaller footprint buildings that may respond more sympathetically to the natural constraints of the land, estuarine margin and access characteristics.

Key characteristics of the site are:-

- The site is presently vacant under utilised development opportunity.
- The site has gentle cross site contour to the coastal edge.
- The site can be accessed from one point for vehicle access but has further pedestrian and cycle connectivity.
- The site is reasonably well located, within easy cycling distance to local shops and leisure amenities and transport links to the city.
- The site is a significant size and capable of accommodating a sustainable new residential community.
- The site enjoys attractive coastal views with desirable aspect.
- The area features natural constraints from minor areas of flooding and inundation that must be appropriately designed for.

Below: The site offers desirable north aspect and capable of delivering a high quality development outcome.



3.0 Planning context

3.1 The subject site is zoned Business Light Industry (BLI). The particularities of the site however suggest an alternative land use would provide for superior planning outcomes.

3.2 The broader zoning patterns of the area offers some useful precedent for a residential zoning with pockets of THAB zones located in areas that offer higher amenity coastal views and proximity. Such zoning patterns are evident to the west and north of the Tamaki River in a range of densities including THAB.

3.3 A little further afield in Auckland the site has some similarities also with the 'Amaia' development located south of Takapuna. This site offers a similar character with proximity to the waters edge and with a major road (Esmond Road) defining the landward boundary. There exists therefore some development precedent to the support the approach to rezone the site for a residential activity.

3.4 Further to the southwest surrounding Otara the residential density zoning increases to feature a predominance of THAB zoning. It is noted that the extent of THAB zoning along Gilbert Road offers in some respects similarities with the site in presenting river views to the north and in part a shared boundary with the BLI zone.

3.5 The plan change area is located adjacent to State Highway 1. Bus services operate along Highbrook Drive but there are no bus stops presently. It is proposed as a part of the plan change to establish better public transport connectivity and support other transport options also. Please refer to the Integrated Transport Assessment for further details.

Below: Extract from AUP zoning. Site is shown edged in red below.

4.0 Vision & design principles

4.1 Highbrook Living will seek to create a vibrant neighbourhood with a strong sense of community, characterised by a range of housing opportunities and within an attractive landscape setting.

4.2 The structure of the proposed master plan responds to the site conditions, with two clusters of housing defining Highbrook Drive and with outlook to the Tamaki River.

4.3 Open space and recreational walkways will define the estuary edge and provide an opportunity for enhancement planting. Housing choice will be provided by a mixture of two and three storey townhouses and apartment buildings. It is also proposed to provide limited convenience retail and food and beverage to service the immediate needs of the neighbourhood. These uses will be delivered as a focal point for the residential community.

4.4 The design principles opposite capture the overall design approach for Highbrook Living. These principles form the basis for the Master Plan concept.

4.5 An assessment of the proposal against the Objectives and Policies of the THAB zone is provided at Appendix 1.

Master Plan Design Principles:

- Maximise the existing site's potential for integrated landscape and architectural design.
- Create an identifiable centre focal point for the neighbourhood.
- Provide for a high degree of connectivity and engagement with the Tamaki River.
- Provide a legible urban structure that capitalises on views and focal points.
- Encourage walking and cycling for recreation and local trips.
- Foster a sense of environmental renewal and stewardship for the Tamaki River.
- Provide a range of housing choice and market price point.

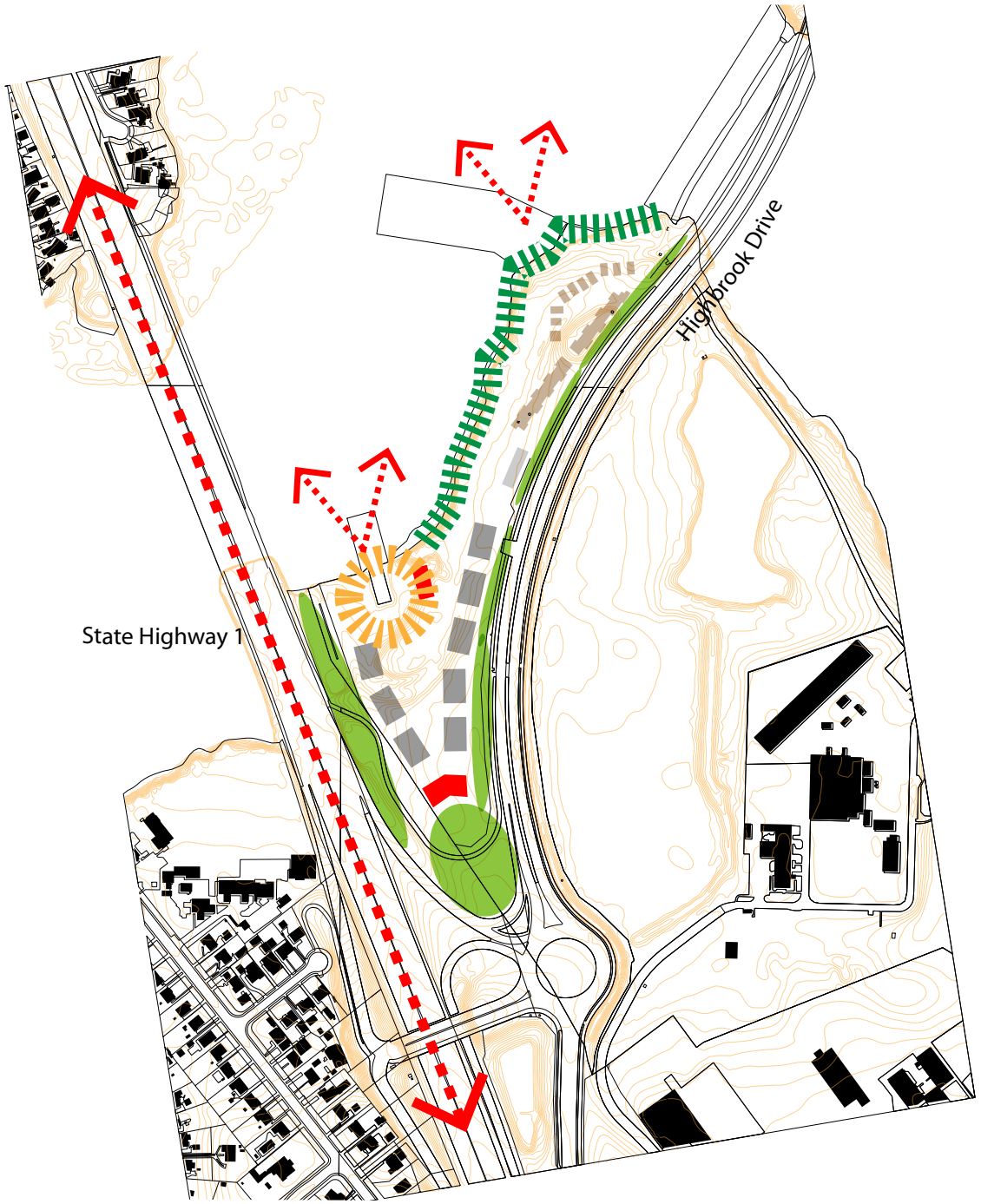
Right: Developments such as the Amaia development on Esmonde Road demonstrate the capacity of unique sites to deliver high quality residential neighbourhoods in a non-traditional manner.

4.4 Maximise the existing site's potential

- Enhance the river frontage for ecological and recreational value.
- Improve access to the water at key locations.
- Retain significant existing trees and vegetation wherever possible.
- Use existing site features and topography to inform the overall layout of development based on enclosure, human scale and views.
- Intensify development at the widest part of the site with a diminishing scale and intensity to the north.

4.4.1 The site benefits from an extensive river frontage and northern aspect. The proposed development forms (smaller footprint buildings) are better able to respond to the sites natural advantages and limitations than the default planning position of larger footprint industrial use buildings.

4.4.2 Affording the opportunity to develop the site for residential use will create a finer grained development response, afford access to the river frontage and create the right conditions for ongoing care and enhancement of this part of the Tamaki River.



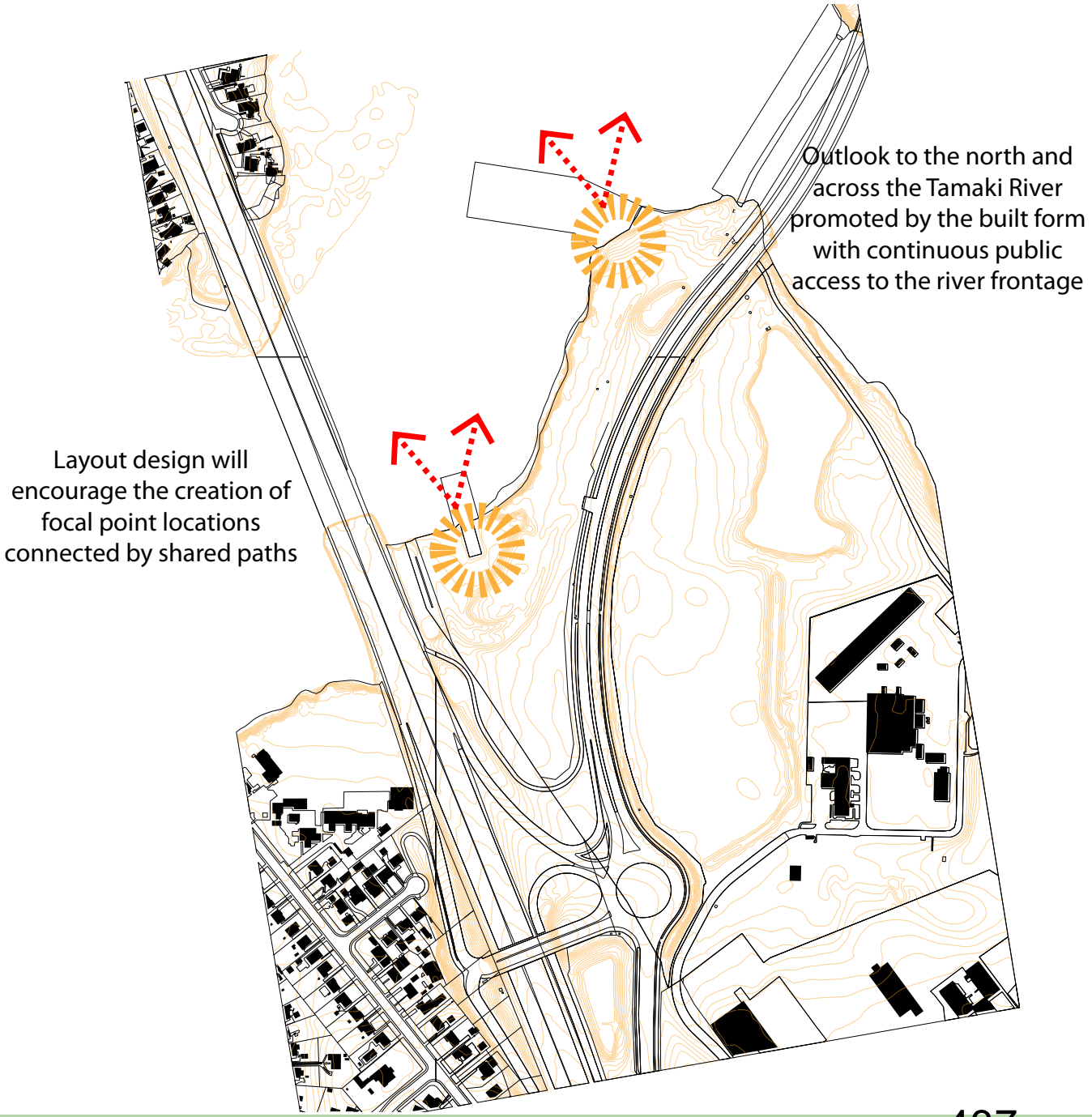
4.5 Create a focal point

- Provide for small scale convenience retail and food and beverage within the development to provide convenience for the residents along with assisting to create a focal point for community activity and events.

- Locate the centre in the southern portion of the site where apartment buildings will be located. A community focal point public open spaces will be planned to include a new wharf on location of preexisting structure.

- Provide public open space within and adjacent to the centre that caters for informal gatherings and community events.

4.5.1 Given the location of the site on the Tamaki River together with the defined nature of the new community it is considered desirable to provide for some convenience retail and food and beverage uses. This element of the design will support the public open spaces proposed and act as a focal point for the residents and also visitors to the community.



4.6 Provide a high degree of connectivity & social engagement.

- Ensure that there is a sufficient quantity and diversity of open space to cater to the recreational needs of the future community.

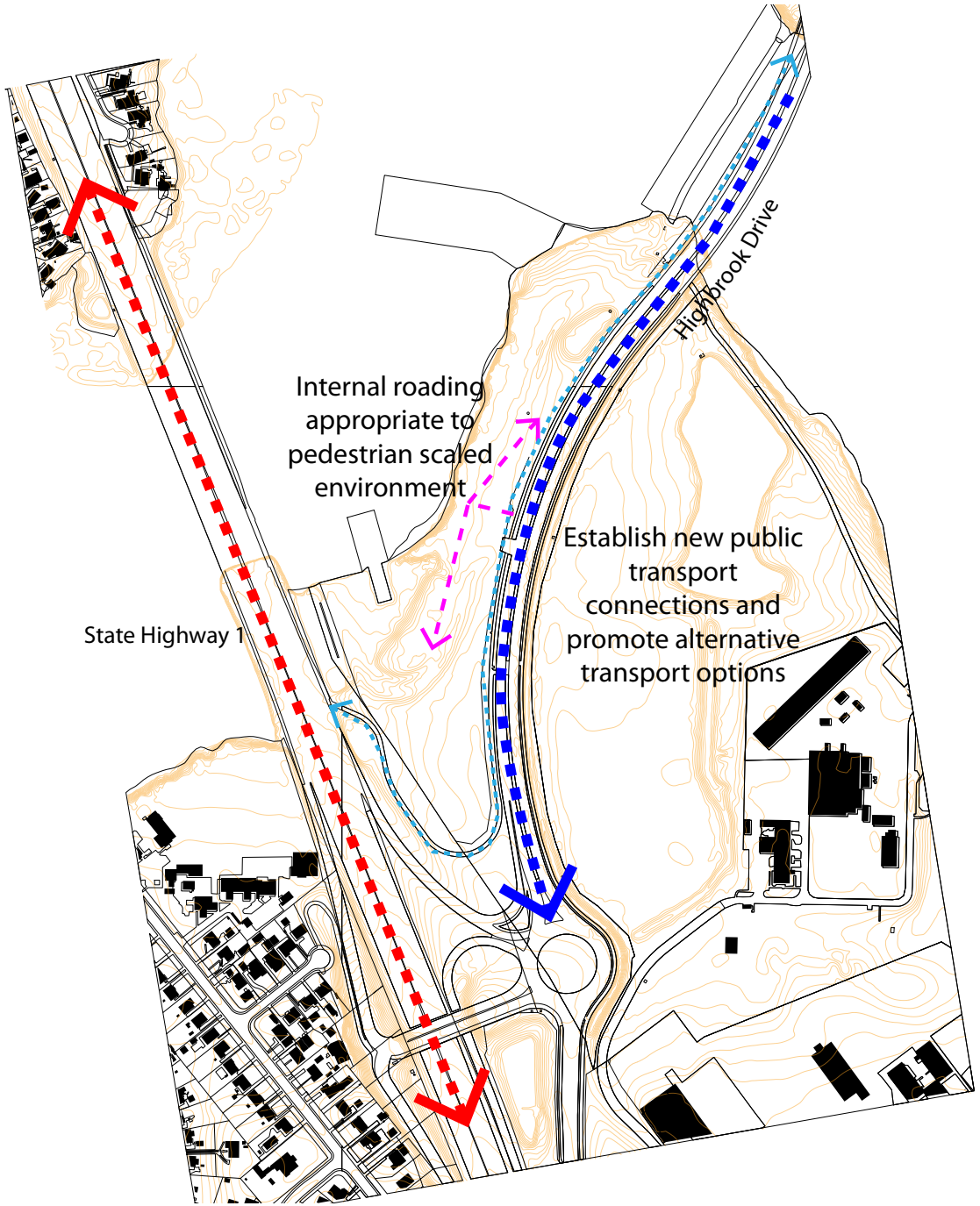
- Utilise the existing river edge and vegetation as a means of connecting the open spaces, resulting in an ecological and recreational network of open space across the site.

- Provide an urban gathering space within the village centre and a larger open space adjacent the centre suitable for community events.

- Incorporate play and exercise into the river frontage walkway and reserve.

4.6.1 The sites natural attributes coupled to the suggested design approach will provide a range of open space character outcomes. The shared path along the river frontage will be set within an enhanced landscape environment and overlooked by the proposed range of housing choice. The intention is therefore to provide a natural edge to the development but that is supported by passive surveillance opportunities.

4.6.2 Complementing the 'natural' amenities of the site more formal spaces located at the south end of the site and configured around the new wharf structure will provide for a gathering or focal point for the development. Supported by the increased density of the clustered apartment buildings it is anticipated these areas will be overlooked and well used by residents encouraging a high degree of social interaction.



4.7 Provide a legible structure that capitalises on views and focal points

- Incorporate architectural features at key locations (e.g. entrance to the site or terminating views on roading alignments) as place-making elements.

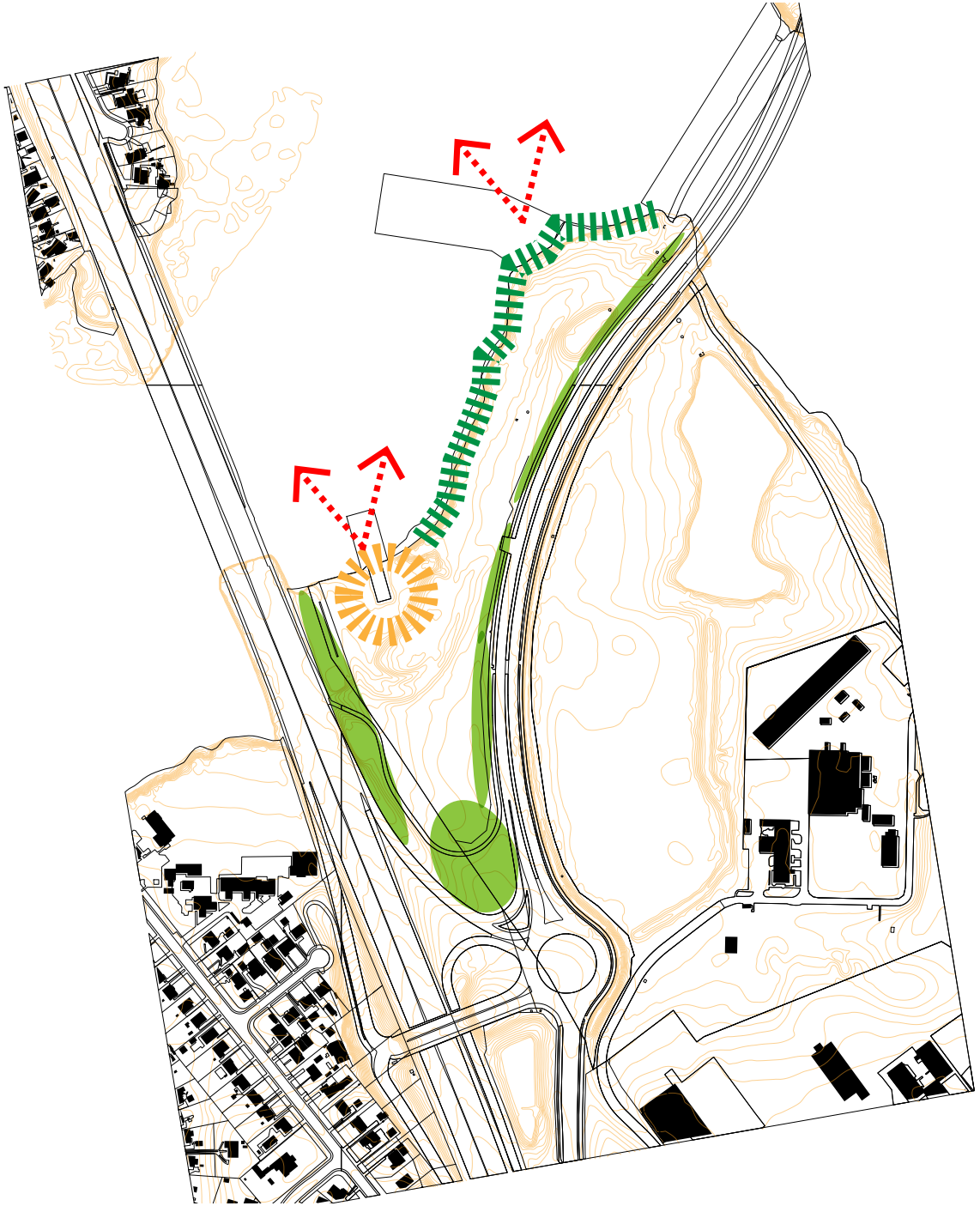
- Design the street hierarchy to be legible, comprising of a primary loop road serving the southern portion of the site and a spine road to the northern portion.

- Design streets to be connected, generally avoiding cul de sacs where possible.

- Terminate streets on open spaces and landscape connections that emphasise internal and external views.

- Design the public realm (open spaces and streets) to be highly connected, legible and visible to promote high levels of activity and surveillance thus improving safety.

4.7.1 Complementing the formal designed spaces the proposed design should identify key locations within the layout for focal point buildings. These buildings will be important opportunities to support the key spatial elements of the overall plan and act as local markers to more distant views.

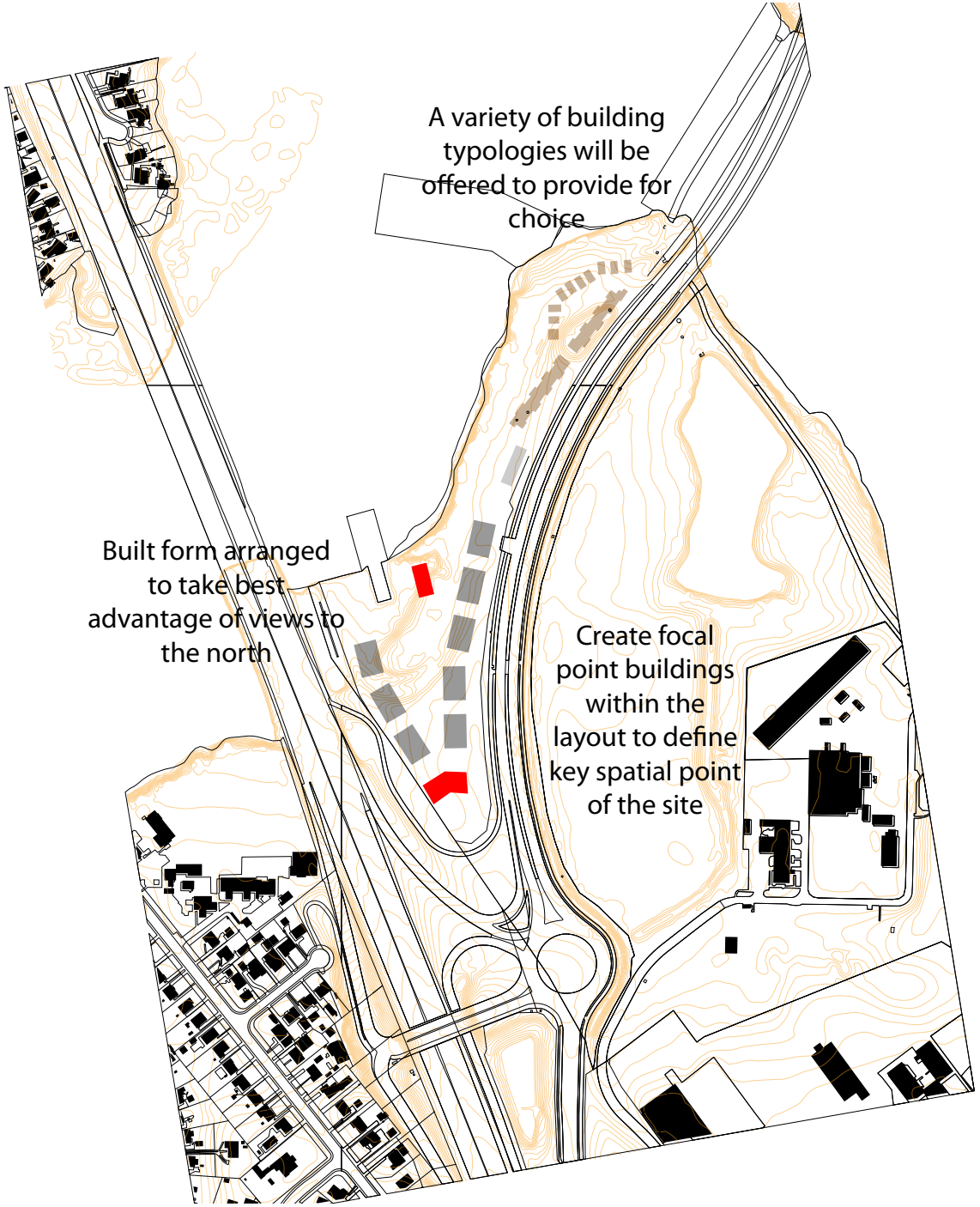


4.8 Provide a high level of housing diversity in product and cost.

- Provide a large variety of dwelling types and sizes.
- Locate larger apartment buildings to the southern portion of the site and smaller scale buildings to the north.
- Site lots / buildings to maximise solar access and passive ventilation.
- Vehicle servicing and parking demands should be visually mitigated in terms of effects through location , design and soft landscape measures.

4.8.1 The plan change seeks to deliver a range of housing options and lifestyle choices including detached, terraced and apartment typologies of various sizes. Lower density built form will be positioned to the north of the site with the higher density buildings clustered at the southern portion of the site to define the more formal civic spaces.

Above: Example of anticipated outcomes for the northern part of the site. Apartment buildings to be located to the south.



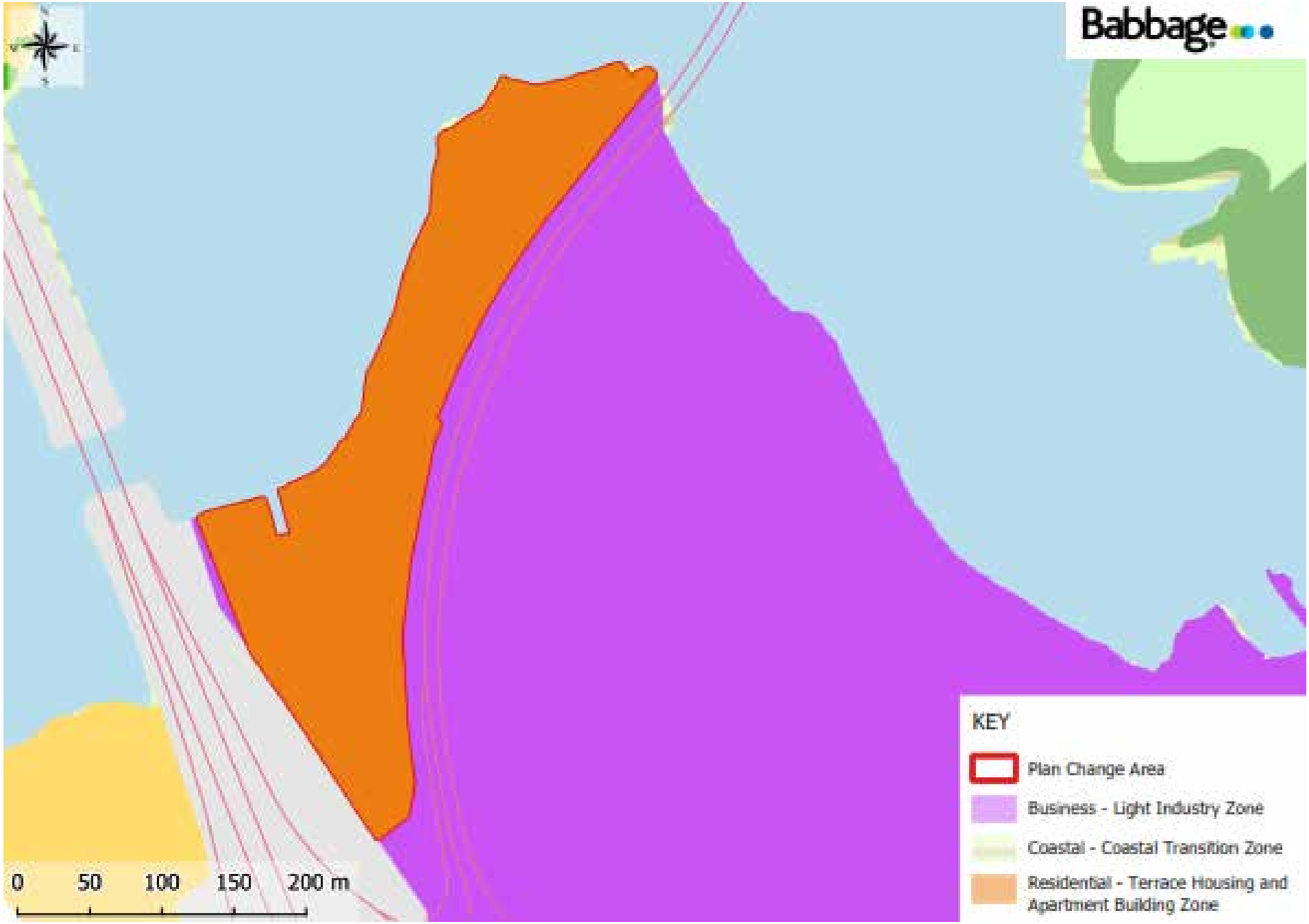
4.9 Proposed Concept Master Plan

4.9.1 The concept master plan shows a possible arrangement of built form and public realm outcomes. Higher density buildings are clustered to the south and define the formal civic spaces whilst lower density typologies form the northern section in a natural river front setting.

4.9.2 Access to and enjoyment of the river frontage is a key element of the design approach. It is envisaged a landscaped path with various focal point spaces will connect the north of the site with the south.

4.9.3 Roading design will be designed to present complementary spaces to the built form and maintain a human scale throughout the development area.

5.0 Proposed zoning



6.0 Conclusion

6.1 The proposal represents an important opportunity to develop a site to a high standard. In terms of urban design the proposal should be supported because:

- The proposal will result in the supply of additional housing choice in a location and form that supports sustainable development principles.

- The physical effects of rezoning have the capacity to be well managed and largely contained to within the site.

- The public spaces can be fully integrated to the design process and anticipated development outcomes. This will yield a high quality design outcome overall.

- The pedestrian scale will be an important component to the desired design outcomes. Building heights and massing will be effectively managed and movement hierachies scaled to provide safe connections that prioritise the human scale.

6.2 In my opinion the proposed plan change will enable a high quality use of a semi derelict site in a strategic location. The density of development enabled by the THAB zone will create the right conditions for the land to be developed at a density that can make a meaningful contribution to housing supply in Auckland whilst also bringing enhancements to the natural environment.

JG Evans MRTPI
25.07.2022

Appendix 1

Urban design assessment table against objectives, policies of the THAB zone

Objective/Policy	Text	Comment	meet/not meet objective
THAB Zone Objective 1	Land adjacent to centres and near the public transport network is efficiently used to provide high-density urban living that increases housing capacity and choice and access to centres and public transport.	The proposal does not benefit from good access to established public transport presently but if rezoned is a suitably sized site to merit additional PT connections and promotion of alternate transport modes for the new residential community.	meets objective
THAB Zone Objective 2	Development is in keeping with the areas planned urban built character of predominantly five, six or seven storey buildings in identified areas, in a variety of forms.	The site is capable of delivering a range of housing typologies in the medium to high density format. The site is large enough to plan effectively for multiple apartment buildings without generating adverse effects to the surrounding community in terms of overlooking, shading effects or possibly building dominance concerns.	meets objective
THAB Zone Objective 3	Development provides quality on-site residential amenity for residents and the street.	The site has very good natural amenities including extensive river frontage and a northerly aspect. The site shape lends its self to supporting a focus towards the river with public access, shared paths and civic focal points designed around this key development asset.	meets objective
THAB Zone Objective 4	Non-residential activities provide for the community's social, economic and cultural well-being, while being compatible with the scale and intensity of development anticipated by the zone so as to contribute to the amenity of the neighbourhood.	Small scale non-residential convenience retail and food and beverage uses are considered to be complementary to the proposed residential activity. These uses would constitute a 'third place' in urban design terms by supporting recreational elements of the concept master plan such as the focal point civic spaces at the south portion of the site.	meets objective

Policy	Text	Comment	meet/not meet policy
THAB Zone Policy 1	Enable a variety of housing types at high densities including terrace housing and apartments and integrated residential development such as retirement villages.	The site is capable of supporting a range of living opportunities in a coordinated and master planned format. The site size, natural attributes and absence of neighbouring development provides significant advantages in providing for an extended range of housing choice.	meets policy
THAB Zone Policy 2	Require the height, bulk, form and appearance of development and the provision of setbacks and landscaped areas to achieve a high-density urban built character of predominantly five, six or seven storey buildings in identified areas, in a variety of forms.	The site is capable of accommodating significant landscape enhancements to complement the architectural elements and fully recognise the development potential of the site.	meets policy
THAB Zone Policy 3	Encourage development to achieve attractive and safe streets and public open spaces including by: providing for passive surveillance optimising front yard landscaping minimising visual dominance of garage doors.	The concept master plan envisages a development outcome that prioritises the passive surveillance opportunities of the public realm whilst also providing for attractive private amenity areas.	meets policy

Objective/Policy	Text	Comment	meet/not meet policy
THAB Zone Policy 4	In identified locations adjacent to centres, enable greater building height through the application of the Height Variation Control where the additional development potential enabled: provides an appropriate transition in building scale from the adjoining higher density business zone to neighbouring lower intensity residential zones, and; supports public transport, social infrastructure and the vitality of the adjoining centre.	It is not proposed to introduce a Height Variation Control for the proposed rezoning.	N/A
THAB Zone Policy 5	Manage the height and bulk of development to maintain daylight access and a reasonable standard of privacy, and to minimise visual dominance effects to adjoining sites and developments.	The height and bulk of the master plan concept diminishes to the north of the site with the taller and larger footprint buildings clustered to the south portion of the site closest to the motorway but with views orientated to the north. It is considered that this approach can deliver a focal point element to the overall development outcomes and not result in potentially incompatible development outcomes between differing typologies albeit contained within the same zone.	meets policy
THAB Zone Policy 6	Require accommodation to be designed to: provide privacy and outlook; and be functional, have access to daylight and sunlight, and provide the amenities necessary to meet the day-to-day needs of residents.	The proposed concept master plan envisages a high standard of private and shared amenity on site. The significant advantages of the site location adjacent to the river are a key 'driver' to deliver on high quality outdoor areas that are well proportioned and orientated to benefit from the orientation of the site.	meets policy
THAB Zone Policy 7	Encourage accommodation to have useable and accessible outdoor living space.	The site is capable of providing for high quality private and public open spaces that are conveniently accessed, safe and overlooked where appropriate.	meets policy

Objective/Policy	Text	Comment	meet/not meet policy
THAB Zone Policy 8	Restrict the maximum impervious area on a site in order to manage the amount of stormwater runoff generated by a development and ensure that adverse effects on water quality, quantity and amenity values are avoided or mitigated.	Detailed design is yet to be undertaken but the concept master plan provides for approximately 35% of landscape area and so would be consistent with the anticipated outcomes for the THAB zone.	meets policy
THAB Zone Policy 9	Provide for non-residential activities that: support the social and economic well-being of the community; are in keeping with the with the scale and intensity of development anticipated within the zone; avoid, remedy or mitigate adverse effects on residential amenity; and will not detract from the vitality of the Business – City Centre Zone, Business – Metropolitan Centre Zone and Business – Town Centre Zone.	Small scale non-residential convenience retail ad food and beverage uses are considered to be complementary to the proposed residential activity. These uses would constitute a 'third place' in urban design terms by supporting recreational elements of the concept master plan such as the focal point civic spaces at the south portion of the site. The scale of the non residential elements will meet the needs for the residential community only.	meets policy

8 Sparky Road, Otara

Highbrook Private Plan Change Request: Infrastructure Report

Job No:	64872#C
Revision:	1
Date of Issue:	19/07/2022

DOCUMENT CONTROL

This report has been prepared by Michael Martin and reviewed by Sukhi Singh.

Respectfully submitted

Babbage Consultants Limited

Michael Martin
Civil Engineering Principal

Sukhi Singh
Technical Director - Planning

19 Jul 2022	Rev 1	Michael Martin	Sukhi Singh
14 Jul 2022	Rev 0	Michael Martin	Sukhi Singh
19 Apr 2022	Draft2	Michael Martin	Sukhi Singh
25 Feb 2022	Draft1	Michael Martin	
Date	**Version**	**Author(s)**	**Reviewer(s)**

TABLE OF CONTENTS

List of Appendices

1 EXECUTIVE SUMMARY

This infrastructure report is submitted in support of a Private Plan Change request to the Auckland Unitary Plan (Operative in Part), made by Highbrook Living Limited.

The Private Plan Change (PPC) seeks to rezone the part of the property at 8 Sparky Road Drive from Light Industry to Residential – Terrace Housing and Apartment Buildings.

This report provides information on the capacity of the existing public water and wastewater infrastructure in relation to the additional demands from the PPC.

It also provides information on the existing flood hazards affecting the site and the impact of the proposed development on those flood hazards.

Information on the capacity of public stormwater infrastructure and stormwater management on the site is set out in the Stormwater Management Plan.

The contents of this report are summarised below:

1. The proposed development enabled by the PPC consists of approximately 500 residential units.
2. There is no existing water supply and wastewater network on the site. New public networks are to be installed on the site, which are to be designed and constructed in accordance with Watercare's Code of Practice.
3. Connection could be made to the nearest public water supply network, which is within 25 m of the site boundary on the opposite side of Highbrook Drive. Connection to the nearest public wastewater network could be made via an onsite pump station and rising main to an existing transmission pipe approximately 230 m south of the site.
4. The water supply demand and wastewater flow from the proposed development have been assessed in accordance with Watercare's Code of Practice and Watercare have confirmed there is sufficient capacity in the public networks for the proposed development enabled by the PPC.

2 INTRODUCTION

Highbrook Living Limited has engaged Babbage Consultants Limited (Babbage) to prepare an Infrastructure Report to support a Private Plan Change Request (PPC) to the Auckland Unitary Plan (Operative in Part) to rezone the land that forms part of the property at 8 Spark Road, Otara (the site).

The PPC seeks to rezone the site from the current Light Industry zoning to Residential – Terrace Housing and Apartment Buildings.

This report provides information on the capacity of the existing public water and wastewater infrastructure in relation to the additional demands from the PPC.

Information on the existing flood hazards affecting the site and the impact of the proposed development on those flood hazards is also provided.

Information on the capacity of public stormwater infrastructure and stormwater management on the site is set out in the Stormwater Management Plan prepared by Babbage.

3 SITE DESCRIPTION

3.1 Location and Property Information

The site is located on the northern side of Highbrook Drive as shown in Figure 1 below.

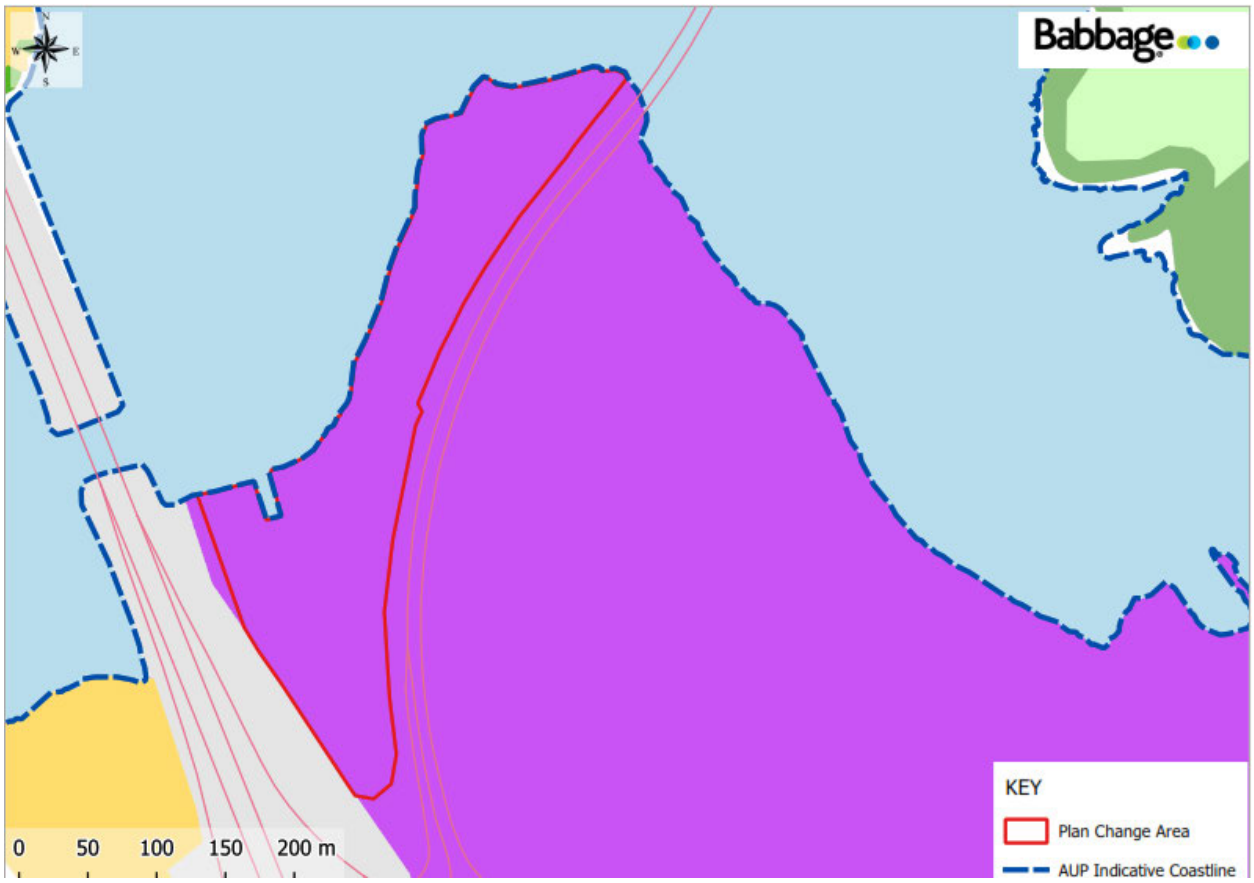


Figure 1: Site Location and Aerial Photograph (from Auckland Council GeoMaps)

The site is bounded by the Tāmaki Estuary to the north and east, and State Highway 1 to the west.

The site address is 8 Sparky Road, Otara, which is the larger property that includes the site and the remaining property area that extends south of Highbrook Drive. Existing property information is provided in Table 1 below.

Table 1: Property Information

Address	8 Sparky Road, Otara
Legal description	Lot 2 DP 209362
Property area	35.02 ha
Plan Change area	Approximately 4.4 ha

3.2 History and Features

The site forms part of the former Ōtāhuhu Power Station site and there are remnant features of the former use as shown on Figure 2 below.

Figure 2: Existing Site Features (from Auckland Council GeoMaps)

The majority of the site is grassed or has low height planting and small to medium sized trees. An existing stormwater pond is located in the northwest corner of the site adjacent Highbrook Drive as shown in Figure 2 above. There is an existing vehicle crossing providing vehicle access to Highbrook Drive near the centre of the eastern boundary and an existing gravel access road through the centre of the site. There is a boat ramp to the Tamaki River at the northern end of the site and the remnants of a barge dock at the southern end of the site.

We understand the existing stormwater pond near the western boundary adjacent to State Highway 1 (SH1), was used as an erosion and sediment pond during construction of Highbrook Drive and the widening of SH1. The entirety of this stormwater pond is located outside the PPC area.

There are also existing overhead transmission power lines adjacent to the western boundary of the site. These power lines are also located outside of the PPC area.

3.3 Site Topography

The majority of the site is relatively flat with an elevation around RL 8 m, with the exception of the north western corner of the site which is also flat but has an elevation around RL 3 m. There is a slope along the Tamaki Estuary. The top of this slope is around RL 7 m and the base of the slope is around RL 2 m. The slope typically less than 45 degrees (1v:1h), however, is locally as steep as approximately 56 degrees (1.5v:1h).

4 PROPOSED PRIVATE PLAN CHANGE

The proposed PPC will allow development enabled by the Residential – Terrace Housing and Apartment Buildings Zone (THAB). Highbrook Living Development Concept Plan has been prepared to illustrate one option for the future development of the site, aligning with the outcomes envisaged by the THAB Zone. The Highbrook Living Development Concept Plan envisages approximately 500 houses on the site based mainly on an apartment typology. The Highbrook Living Development Concept Plan shown in **Appendix A**.

Vehicle access from the public road network to the site is to be provided from Highbrook Drive via a new intersection near the centre of the eastern boundary. The new intersection with Highbrook Drive has already been approved. An internal loop road is proposed within the southern area of the site, which is aligned beneath and through the proposed apartment buildings. An internal cul de sac road is proposed within the northern area of the site.

An esplanade reserve with a walkway is proposed along the western boundary adjacent the Tamaki Estuary, with a public recreation area and an existing boat ramp.

5 WATER SUPPLY

5.1 Existing Water Supply Network

There is currently no private water supply network on the site and no connection point from the public network to the site. There is an existing 250 mm public watermain located along the eastern berm of Highbrook Drive as shown in Figure 3 below.

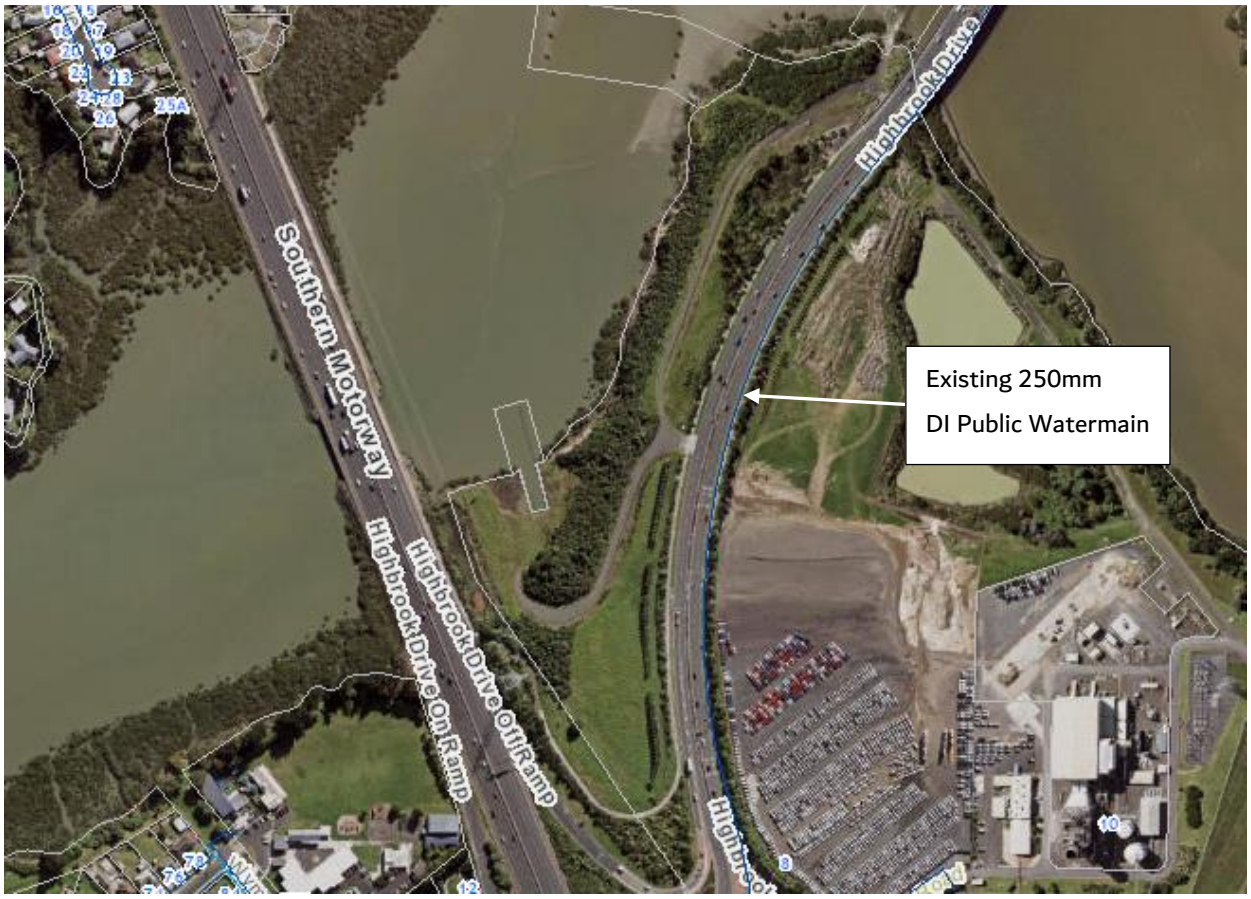


Figure 3: Existing Public Water Supply (from Auckland Council GeoMaps)

5.2 Proposed Water Supply Network

To service the proposed development enabled by the PPC, water supply reticulation will be required through the site, including watermains with a minimum size of 100 mm and associated rider mains, valves, fittings and hydrants. The onsite water supply reticulation would be designed and constructed in accordance with Watercare's Code of Practice.

To provide a 'loop' connection to the public water network, two connection points would be required, with one possibly being located at the proposed intersection and the other near one end of the site.

To confirm whether the public network has sufficient capacity for the proposed development, Babbage submitted an infrastructure assessment form to Watercare in November 2021. The completed form is provided in **Appendix B**.

Watercare subsequently confirmed there is sufficient capacity in the public network for the proposed development. Their confirmation letter received on 13 December 2021 is also provided in **Appendix B**.

We note the water demand provided to Watercare was based on an assumed proposed development of 500 residential units and no commercial development. This resulted in average and peak water demands of 3.8 l/s and 19 l/s, respectively. The calculations for the water demand were carried out in accordance with Watercare's Code of Practice and are provided in **Appendix C**.

6 WASTEWATER

6.1 Existing Wastewater Network

There is currently no private wastewater network on the site and no connection point from the public network to the site. There is an existing 825 mm public transmission pipe located approximately 230 m south of the site as shown in Figure 4 below. This transmission pipe connects to a pump station approximately 650 m west of the site in Billington Reserve.

Figure 4: Existing Public Wastewater Network (from Auckland Council GeoMaps)

6.2 Proposed Wastewater Network

To service the proposed development enabled by the PPC, wastewater reticulation will be required through the site. This is likely to be a gravity system discharging to an onsite pump station, probably located in the southern area of the site, to allow a rising main connection to the existing Watercare transmission pipe south of the site near Hellabys Road as shown in Figure 4 above. On site pipes are likely to be 150 mm

diameter although some 225 mm diameter pipes may be required. The onsite and offsite wastewater reticulation would be designed and constructed in accordance with Watercare's Code of Practice.

To confirm whether the public wastewater network has sufficient capacity for the proposed development, Babbage submitted an infrastructure assessment form to Watercare in November 2021. The completed form is provided in **Appendix B**.

Watercare subsequently confirmed there is sufficient capacity in the public network for the proposed development. Their confirmation letter received on 13 December 2021 is also provided in **Appendix B**.

We note the wastewater flows provided to Watercare were based on an assumed proposed development of 500 residential units and no commercial development. This resulted in peak dry weather flow (PDWF) and peak wet weather flow (PWWF) of 9.4 l/s and 21.0 l/s, respectively. The calculations for the wastewater flows were carried out in accordance with Watercare's Code of Practice and are provided in **Appendix C**.

Watercare have advised that a static capacity assessment of the proposed wastewater connection pipeline will be required at resource consent stage.

Appendix A

Highbrook Living Development Concept Plan

HIGHBROOK
LIVING DEVELOPMENT
CONCEPT PLAN

Key:

A Dairy
B Shared Office Facility
C Cafe
D Apartment Blocks -predominantly five storeys
E Terrace Houses
F Stand alone houses / Duplexes

BABBAGE CONSULTANTS

18 February 2022

Appendix B

Watercare Communications

GENERAL ENQUIRY Infrastructure Assessment Form		
Date of Application	0□/11/2021	
Address of Development	□ □□□r□□ R□□d □ □□r□ □□□□l□□d 202□	
Layout Plan of Proposed Development clearly showing: • Aerial photograph • Road names • Boundary of development	R□□□r □□□□□□□□d □□□□□□□□ □□ □l□d□□□d 02/11/2021	
	Description	**Comment**
Current Land Use	□□d□□□l□□□d	*Residential (Single family dwellings) / Residential (Multi-unit dwellings) / Residential (Multi-storey apartment blocks) / Commercial / Industrial / Other (Please Specify)*
Proposed Land Use	R□□d□□□□l □M□l□□□□□□d□ □ll□□□□□	
Total Development Area (Ha.)	□□□ □ □	
Estimated Number of Residential Households (Consent & Ultimate)	□00 □□□□	*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 ~~Non-~~ Residential Demand (L/s)	□□□l/□ □□d 1□l/□	*Watercare CoP*
Average and Peak Non-Residential Demand (L/s)	□/□	*Watercare CoP*
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)	□D□ □ □ □□□l/□ □□ □ □ □ 21□0 l/□	*Watercare CoP*
Peak DWF and WWF Non-Residential Design Flows (L/s)	□/□	*Watercare CoP*
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	

Ryan Liu

From: Michael Martin
Sent: Tuesday, 2 November 2021 9:36 AM
To: IGotelli (Ilze); Sukhi Singh
Cc: KDavisMiller (Keri); AStuart (Andre); Sukhi Singh; Jono Ryan
Subject: RE: Plan Change - Highbrook (Part of the site at 8 Sparky Road, Otara)

Hi Ilze,

Further to comm's below, we provide information on the proposed development as follows:

PROPOSED DEVELOPMENT

The site is located on the western side of Highbrook Drive as shown below. Site area is approx. 4.9 ha.

The proposed plan change is intended to allow development of up to 500 residential units.

WATER SUPPLY

There is an existing 250 mm public watermain on the eastern side of Highbrook Drive as shown below.

The intention would be to connect to the existing public 250 mm watermain. The peak water demand for proposed development in accordance with Water Supply CoP is approx. **19 l/s** for **500** residential units.

WASTEWATER

There is an existing 825 mm public wastewater transmission pipeline to the south of the site as shown below.

The intention would be to connect to the existing public 825 mm wastewater pipeline as shown above. The peak wet weather flow (PWWF) for proposed development in accordance with Wastewater CoP is approx. **21 l/s** for **500** residential units.

Could you please advise a suitable day and time to discuss the above with your team?

Regards,

Michael Martin
NZCE(Civil), BE(Civil)(Hons), CMEngNZ, CPEng, IntPE(NZ)
Civil Engineering Manager
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Appendix C

Water and Wastewater Calculations

Calculation Sheet

Job No: 64872#C **By:** MJM **Checked:** _____ **Date:** 8/11/2021 **Page:** 1 **of:** 1

Project: Highbrook Living

Subject: Water Supply Demand

500	Units	2	Bedrooms	=	3	people
		3	Bedrooms	=	3	people

Design population	=	500	dwellings	x	3	people	=	1,500	people
Average daily demand	=		1,500	x	220		=	330,000	l/day
							=	**3.82**	**l/sec**
Peak daily demand	=	330,000	x	2	=	660,000	l/day		
							=	7.64	l/sec
	=	7.64	x	2.5	=	**19.10**	**l/sec**		

JOB NAME:	Highbrook Living	**DATE:**	28/10/2021
JOB NO:	64872#C	**DES BY:**	RL
SUBJECT:	**Post-Development Wastewater Flows**	**CHKD BY:**	MB

Residential Wastewater Catchment Design Flow								
Catchment ID	No. of Dwellings	No. of Bedrooms	Occupancy Per Household	Litres Per Person, Per Day	Peak Dry Weather Flow (PDWF)		Peak Wet Weather Flow (PWWF)	
					Peaking Factor	**Design Flow**	Peaking Factor	**Design Flow**
				l/p/d		**l/s**		**l/s**
500 UNITS								
UNIT A - 2 BEDROOM	350	2-4	3.0	180	3.0	**6.56**	6.7	**14.66**
UNIT B - 3 BEDROOM	150	2-4	3.0	180	3.0	**2.81**	6.7	**6.28**
Total	**500**					**9.38**		**20.94**

NOTES:

1 Residential wastewater design flows have been calculated according to Water and Wastewater Code of Practice for Land Development and Subdivision, Chapter 5, Section 5.3.5.1.1 (A)

Stormwater Management Plan Highbrook Private Plan Change Request

Final

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Document control

Purpose

Purpose	To support the Highbrook Private Plan Change Request application

Document

Document Name	Stormwater Management Plan – Highbrook Private Plan Change Request

Approval

Author of the Stormwater Management Plan: Suman Khareedi, Jono Ryan & Michael Barker		
Reviewed	Sukhi Singh	Date:22/07/22
Approved	Sukhi Singh	Date: 22/07/22

Table of contents

Executive summary

The overall purpose of the Stormwater Management Plan (SMP) is to provide guidance to the applicant and Auckland Council on how stormwater will be managed based on a developed future land use scenario, and to support the Private Plan Change Request application.

This SMP is consistent with Council's policies and plans. Non-statutory policy and planning documents are also considered.

This Stormwater Management Plan (SMP) has been prepared to support the Highbrook Private Plan Change Request. The Plan Change area is part of the site at 8 Sparky Road, Ōtara, which was the site of the former Ōtāhuhu Power Station.

The purpose of the Plan Change is to enable the change in the use of the site from Light Industry Zone to Terrace House and Apartments Zone (THAB). The residential use of the site enables efficient use of the land resource in a strategic location, that has a high level of visual amenity offered by the Tāmaki Estuary environments.

The scope of the SMP:

The scope of this SMP is to:

- Detail proposed stormwater management for development of the plan change area.
- Demonstrate how stormwater management related expectations under the Auckland Unitary Plan (AUP) and Auckland Council's Stormwater Network Discharge Consent can be met.

Outcomes of the SMP:

The outcomes sought by the SMP are:

- An integrated stormwater management approach.
- A water sensitive treatment framework that manages and mitigates the impact of land use change from industrial to residential use.
- Provide for the enhancement of the Tāmaki Estuary environments.
- Identify flood risk areas and ensure that development is located or appropriately managed within these areas.
- A set of Best Practice Options (BPO) for stormwater that can be applied to the development.

Network Discharge Consent (NDC)

Auckland Council obtained a Region-wide Network Discharge Consent to authorise the diversion and discharge of stormwater. The area covered by the NDC includes all urban zoned land. The preparation of a SMP is a direct requirement of the NDC for any activity seeking to utilise or fall within the parameters of the NDC by having the SMP "adopted" into the NDC framework. In relation to this Private Plan Change Request, the NDC requires that a SMP only be adopted if a SMP has been prepared to support the plan change and the plan change must be consistent with that SMP (condition 13b). This SMP has been prepared to support the Private Plan Change Request for the rezoning of part of the site located at 8 Sparky Road, Ōtara.

The Plan Change Request seeks to rezone the site from Light Industry Zone to THAB Zone. The future development of the site will be required to align with the objectives, policies, and rules framework of the THAB Zone.

The Development Concept Plan to illustrate one option for the future development of the site, aligning with the outcomes envisaged by the THAB Zone. The Development Concept Plan envisages approximately 500 houses on the site, based on an apartment typology.

A new stormwater management system will replace the current stormwater management system on site comprising of table drains, a 300 mm stormwater culvert, and a catchpit. The new stormwater system will be a piped stormwater reticulation system with suitable stormwater treatment devices that comply with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. A detailed design of this stormwater management system will be developed in the future to support the Resource Consent application. Once implemented, this new stormwater management system will service all buildings, impervious areas, and some previous areas. The remainder of the pervious areas (less than 30% of the total site) viz., the area of the future esplanade reserve, will remain 'unconnected' thereby draining directly to the Tāmaki River.

The proposal is to treat stormwater from the entire site using new treatment devices that are designed to comply with GD01/TP10. The existing stormwater pond that treats runoff from a small area (0.9ha) of Highbrook Drive (refer to Figure 1) will need to be decommissioned to enable development within this portion of the site. To enable decommissioning this pond, the proposal is to combine the treatment of runoff from the subject section of Highbrook Drive with that from the site in device(s) to be constructed. Once vested in Auckland Council, this will reduce the operation and maintenance requirements for one treatment pond.

The proposed development plan and the topography of the site allows for the following four options for stormwater treatment:

1. A wetland (or a coastal wetland) constructed in conjunction with the creation of the esplanade reserve along the banks of the Tāmaki estuary.
2. Two stormwater treatment ponds at both ends of the site to treat approximately half the site in each pond.

3. Proprietary treatment devices (viz., Stormfilters) at both ends of the site to treat approximately half the site in each device.

4. Raingardens constructed along the proposed road.

Raingardens (Option 4) are not preferred, owing to operation and maintenance requirements and Auckland Transport's preference to not have them in the road corridor. Therefore, options 1, 2 and 3 are recommended for this site.

This new stormwater system will be a piped stormwater reticulation system that complies with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. As such, the network will have adequate capacity to convey 10% AEP event flows. The overland flows will be along the roads to be formed. No secondary flow structures viz., culverts are deemed necessary.

This site or the properties along the banks of Tāmaki Estuary downstream of the site, are neither flood prone nor flood sensitive. Only a small portion of the site in the vicinity of the barge dock (on the western side of the site) and the northern tip of the site that are at RL 2.0 m are expected to get inundated by 0.34 m during a 1% AEP event. The future development of the site will be carefully designed to ensure that habitable floors are not proposed in the section of the site that is flood prone or flood sensitive.

The future road network for this site can be aligned with the existing gravel roads. As such the overland flow paths within the site remain largely unchanged after the development.

The pipe network to service the site will be independent of the existing Auckland Council's stormwater network because of the site's location in relation to existing Auckland Council stormwater network. Stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. As such, the hydraulic connectivity will be directly to the Tāmaki Estuary flows. The time of concentration (ToC) for the flows from the site will be significantly less than the ToC for the flows in Tāmaki Estuary or the Ōtara Creek in the vicinity of the site.

The proposal is to vest the entire stormwater management system to be developed for this site, in Auckland Council. The future asset ownership will be with Auckland Council.

No bespoke operation and maintenance requirements are envisaged for the stormwater management system proposed for this site. They will be consistent with the operation and maintenance requirements of the wider Auckland Council stormwater network.

The principles outlined for the proposed stormwater management system is consistent with the objectives of the NDC. The proposed stormwater management system meets the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent (NDC) that the Auckland Council holds. There are no departures from the Auckland Council Code of Practice or the connection requirements of the NDC.

Changing the zoning from Light Industry to THAB will have a lesser impact on the environment from the perspective of stormwater management. Under the AUP(OP), the

maximum permissible impervious area in the THAB Zone is less than that in the Light Industry Zone. This will result in reduced stormwater runoff volume and peak flows into the receiving environment. Rezoning the land as proposed will not result in any material difference in water quality, as in both cases, runoff will need to be treated to comply with the guidelines in GD01/TP10 and conditions of the Network Discharge Consent (NDC).

Establishing a combined treatment facility for the site and subject section of Highbrook Drive (currently being treated in a separate pond), will reduce maintenance requirements for Auckland Council. The opportunity to create wetland along the bank of the Tamaki Estuary will result in high level of amenity for the public, similar to the stormwater treatment facilities in the Highbrook Business Park further north along Highbrook Drive.

Rezoning as proposed has the potential for improvements both in the short term (establishment of an Esplanade Reserve area) and the long term (residential amenity). Establishment of an Esplanade Reserve in the future will provide public access and amenity, with ongoing maintenance of the coastal vegetation. In addition, residential development offers greater opportunities for planting, maintenance and enhancement of the main part of the site, as well as the coastal area.

1 Existing site appraisal

1.1 Summary of data sources and dates

Existing site appraisal item	Source and date of data used
Topography	• Auckland Council GeoMaps
Geotechnical / soil conditions	• Babbage Geotechnical Appraisal Memo of 17 February 2022 prepared by Jordan Moll
Existing stormwater network	• Auckland Council GeoMaps and site inspection
Existing hydrological features	• Auckland Council GeoMaps and site inspection
Stream, river, coastal erosion	• Site inspection, Geotechnical appraisal
Flooding and flowpaths	• Auckland Council GeoMaps and site inspection
Coastal Inundation	• Auckland's Exposure to Coastal Inundation by storm-tides and Waves Technical Report 2020/024
Ecological / environmental areas	• Desktop Ecological Assessment Memo by Bioresearches dated 19 July 2022 prepared by Treffery Barnett
Cultural and heritage sites	• No sites identified in the AUP(OP)
Contaminated land	• Preliminary Contamination Review by Babbage Consultants Ltd dated 15 July 2022 prepared by Tiago Teixeira.

1.2 Location and general information

The land subject to the Private Plan Change Request ("the site") is the part of 8 Sparky Road, Ōtara (shown in Figure 1) with a parcel ID 7534518. The site forms part of the former Ōtāhuhu Power Station site (closed in 2015). It is bound by Highbrook Drive to the south-east, Tāmaki Estuary to the north, Ōtara Creek to the Northeast, and State Highway 1 (SH1) to the west.

The site is currently zoned Light Industry. The proposal is to change the zoning to Terrace House and Apartments Zone (THAB). Figure 1, below, shows the area subject to the Plan Change Request. A plan of the existing site is also included in Appendix A1.

Figure 1: Location of plan change area (the Site)

Existing site element	
Site address	• 8 Sparky Road, Ōtara
Legal description	• Lot 2 DP 209362
Current Land Use	• Vacant. A part of site adjoining Highbrook Drive is occupied by a small stormwater pond.
Current building coverage	• N/A
Historical Land Use	• Former Ōtāhuhu Power Station

The site is approximately 4.4ha and comprises vacant land with predominantly bush and grass cover. Some additional features at, and adjacent to, the site include (refer to figure 2, below):

1. Barge dock at the south end of the site. This was used for materials supply to support the construction of the former Ōtāhuhu Power Station.
2. Stormwater treatment pond towards the northern end of the site, adjacent Highbrook Drive. This pond treats stormwater runoff generated by a portion (approximately 0.9ha) of Highbrook Drive.

3. Boat ramp, at the northeast end of the site.
4. Gravel access road along the length of the site, running parallel to Highbrook Drive.
5. Concrete box culvert (4m x 2.4m) below Highbrook Drive at the north end of the site to allow vehicle access between the east and west sides of Highbrook Drive. This access has been blocked off with a fence and gate.
6. A Weir across Ōtara Creek, built as part of the Otahuhu Power Station to dam flows from Ōtara Creek to allow intake of water for cooling of the power station (figure 3).
7. Water cooling pond, where discharge of hot water from the former power station would cool down before discharging to Tamaki River. This pond has partly backfilled. The reminder of the pond is currently being used as a sediment control pond.
8. 1800mm diameter outfall pipeline between the water-cooling pond and Tamaki River. This pipeline runs across the north end of the subject site. This outfall pipe discharges into the Tamaki Estuary via three lines of diffusers identified by the markers.

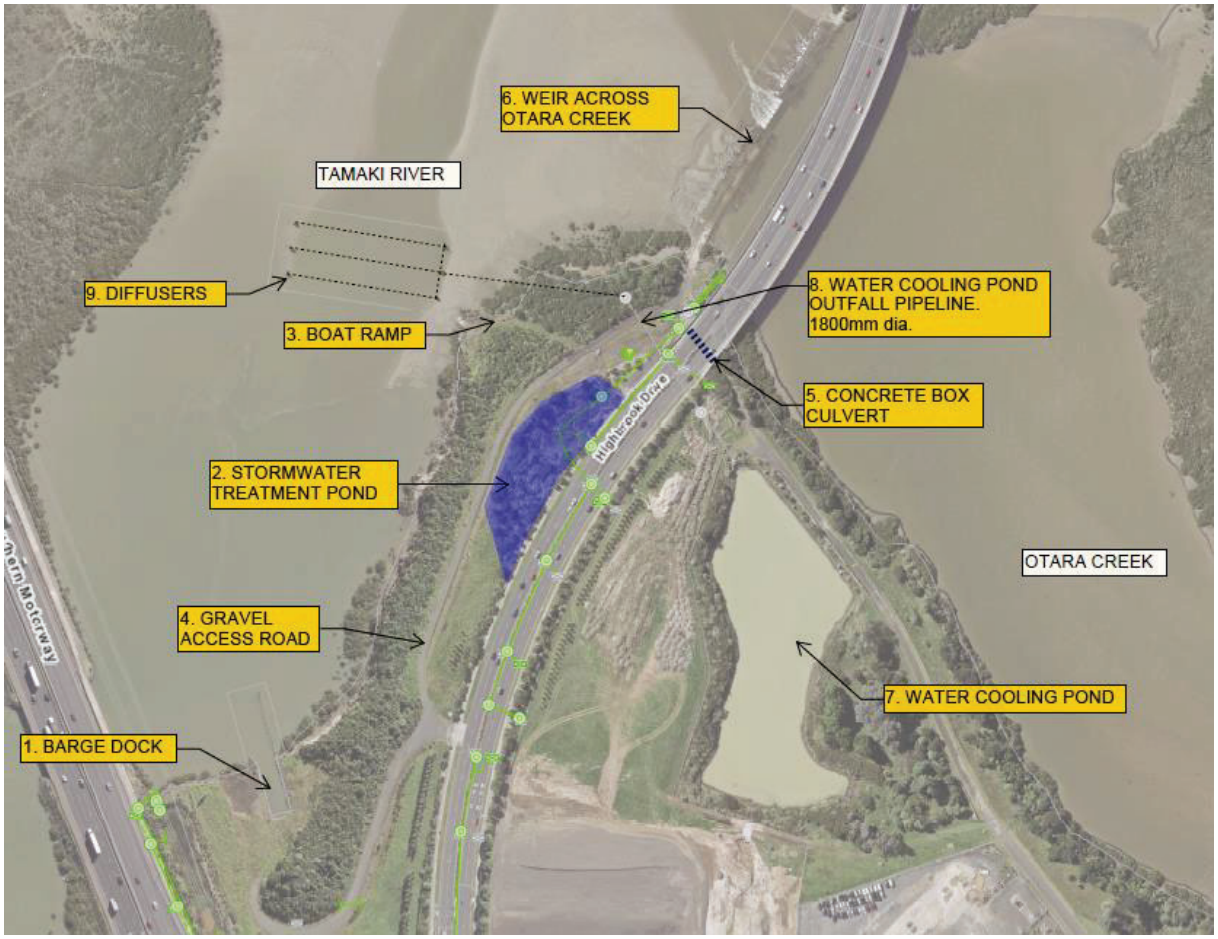


Figure 2: Existing Site Features

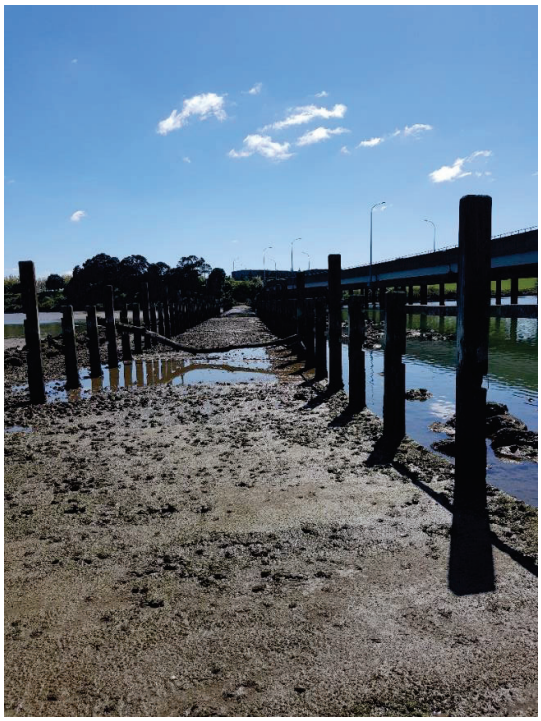


Figure 3: Existing Weir across Ōtara Creek

Figure 4: Reminder of the water cooling pond being used as a sediment control pond

1.3 Topography

The site generally falls from Highbrook Drive to the Tāmaki Estuary (north-westward direction) with the north end of the site falling to Ōtara Creek (north-eastward). The highest point of the site (RL 9.5 m) is in the south-eastern corner of the site. The topography of the site comprises of three distinct terraces. The first terrace is along the eastern boundary of the site (RL 8.0-9.5 m). The second terrace is a 25-30 m strip of land along the gravel road at an RL of 7.5-8.0 m. The third terrace is in the south-western corner of the site at an RL of 2.0-3.0 m in the vicinity of the barge dock.

1.4 Geotechnical

The geological map (see figure 5) indicates the south and centre of the site is underlain by pumiceous deposits of the Puketoka Formation (tp), described light-grey to orange-brown, pumiceous mud, sand and gravel, with muddy peat and lignite. The north part of the site is underlain by Lithic tuff of the Auckland Volcanic Field (avt), being thin graded beds of grey, mud- to sand-sized fragments of comminuted, country rock (mainly sandstone, mudstone, alluvium, micaceous sand) together with basalt and basanite fragments.

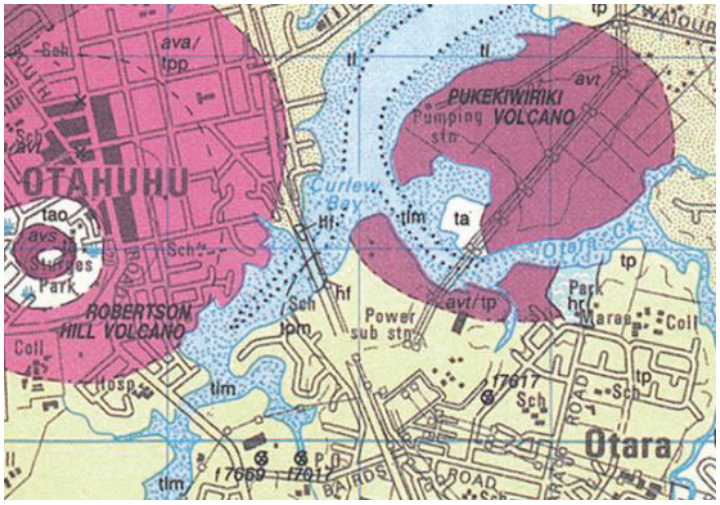


Figure 5: Geological Map

The desk study completed by Babbage, using details of historic investigations carried out close to the site, identifies the ground conditions to comprise of clay, silt, and sand of the Puketoka formation, overlain in part by tuff and other AVF deposits and/or surficial fill. The Puketoka formation is anticipated to comprised mostly stiff to hard silt over the top 8-15m with some loose to dense silty sand lenses. Competent Kaawa Formation sedimentary rock is expected between 15 m and 22 m below ground level.

Figure 6: Slope and condition along the bank of Tamaki River estuary

The northern most part of the site was reclaimed in the 1960s. In the late 1960s and 1970s an area in the southwestern corner of the site, adjacent to Tāmaki Estuary, was reclaimed. The source of the fill is unknown. Nonetheless, it appears to comprise of approximately 1.0m of well compacted aggregate separated from the underlying alluvium by a geotextile.

In the early 2000s significant earthworks were undertaken in the southern and eastern part of the site, and the land to the south and east, for the construction of Highbrook Drive. Large amounts of fill material were stockpiled in this area.

The site slopes gently down to the Tamaki River estuary along the western and northern boundaries with a thick vegetation and mangroves along the coastline. As such, the site is not considered to be susceptible to slope stability issues or coastal erosion.

1.5 Existing drainage features and stormwater infrastructure

The site is vacant land. The drainage/stormwater infrastructure currently present on site comprises the following (refer to figure 7, below):

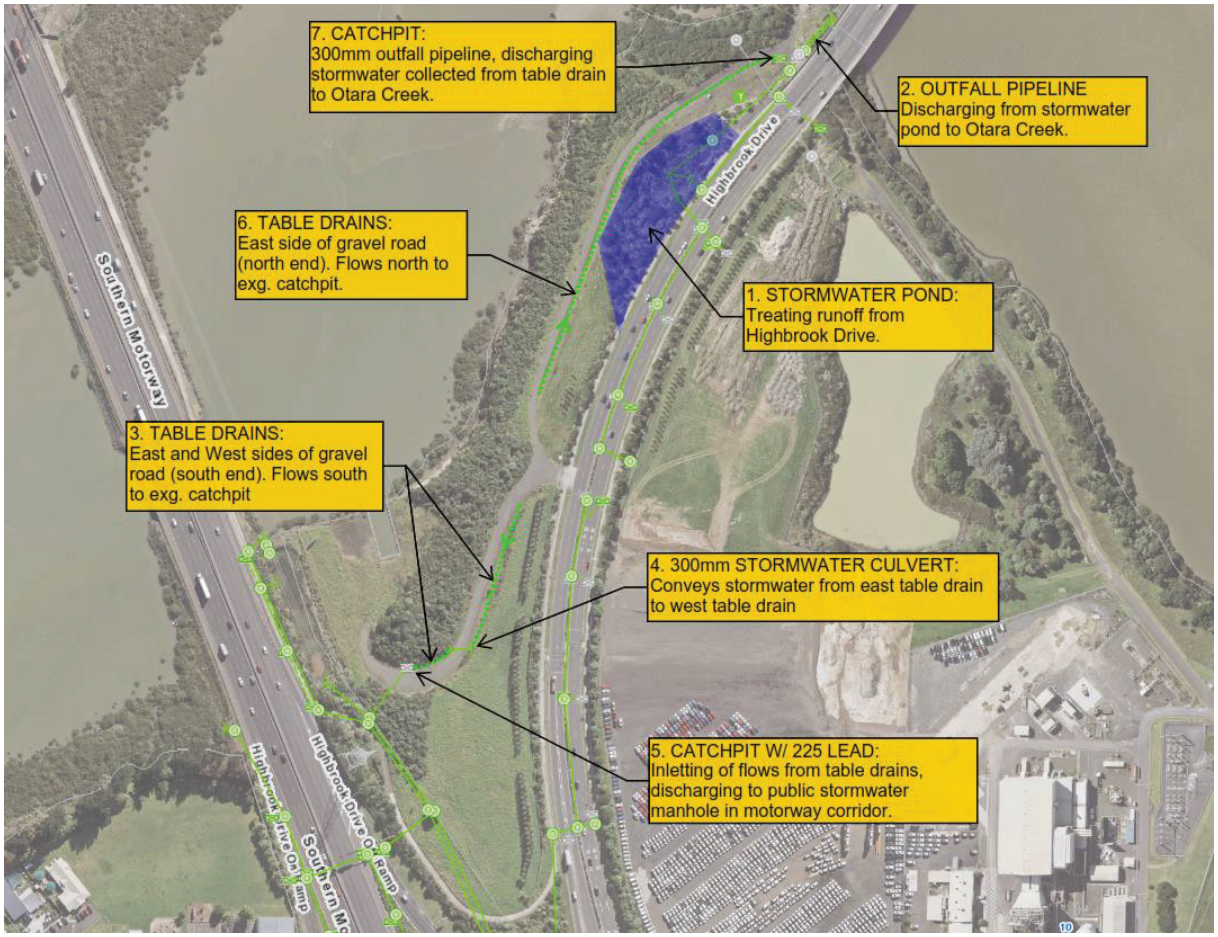


Figure 7: Existing drainage features & stormwater infrastructure

1. A stormwater pond that treats runoff from a 0.9 ha section of Highbrook Drive
2. Outfall pipeline from the stormwater pond that discharges to Ōtara Creek estuary
3. Table drains on either side of the gravel road (south end), flowing south to existing catchpit.
4. A 300 mm stormwater culvert across the gravel road that conveys stormwater from the eastern table drain to the western table drain (figure 8).
5. A catchpit and a 225 mm diameter lead connecting the discharge from the table drain (south end) to the existing manhole 2000058569 in the motorway corridor.
6. Table drains on the east side of the gravel road (north end), flowing north to existing catchpit.
7. A catchpit and 300 mm outfall pipeline, discharging to Ōtara Creek estuary.
8. 1800 mm outfall pipeline from the water cooling pond, traversing northeast across the site (refer to figure 2).

Figure 8: 300mm culvert across the internal gravel road

1.6 Receiving environment

The receiving environment for the site is the Tāmaki Estuary which forms part of the Hauraki Gulf catchment area (refer Figure 8.5.3.1 of the Regional Policy Statement in the AUP(OP)). Figure B7.4.2.1 of the AUP(OP) identifies the Tāmaki Estuary as a marine degraded area in Auckland (Degraded Area 1).

The receiving environment includes the Significant Ecological Areas (SEA) shown in Figure 9 below. The AUP(OP) describes these SEAs as:

- **SEA-M2-45w2** – Wading bird habitat. Extensive areas of feeding habitat for waders along this coastline. The whole of the Tamaki Estuary is a regionally important wildlife habitat and has been selected by the Department of Conservation as an Area of Significant Conservation Value (ASCV).
- **SEA-M2-45c** – Otahuhu Creek. Extensive areas of feeding habitat for waders along this coastline. SEA-M2

Figure 9: Extent of Significant Ecological Area

Both of the SEAs described above are either upstream of the site or located on the far bank of Tāmaki Estuary (opposite side of the subject site). There are no SEA areas delineated in the AUP along the banks of Tāmaki Estuary bordering the site.

There are no Natural Resources overlays applied over the site in the AUP(OP).

1.7 Existing hydrological features

The only hydrological feature on the site is the stormwater treatment pond that treats runoff from approximately 0.9 ha section of Highbrook Drive. It occupies an area of approximately 3,000 m^2 in the north-eastern corner of the site with an estimated storage volume of approximately 300 m^3.

1.8 Flooding and Overland Flow Paths

Auckland Council, based on rapid flood modelling, has identified three overland flow paths through the site. These are shown in in Figure 10. Our site inspection has identified that there are no overland flow paths entering the site from neighbouring land. There are two overland flow paths that start within the site. They are:

1. The overland flow path along the table drains of the gravel road.

2. The overland flow path in the southern part of the site that drains to the NZTA stormwater pond.

The major overland flow path shown to run into the site at the northern end from Highbrook Drive from the water-cooling pond to the east of Highbrook Drive does not flow across the Tamaki Drive into the site as shown in the Auckland Council GeoMaps. The pond outlet structure has a flood gate (Figure 11) that allows discharge of secondary overland flows (or flows in excess pond discharge rate) directly to Tamaki Estuary though the 1800mm outfall pipeline.

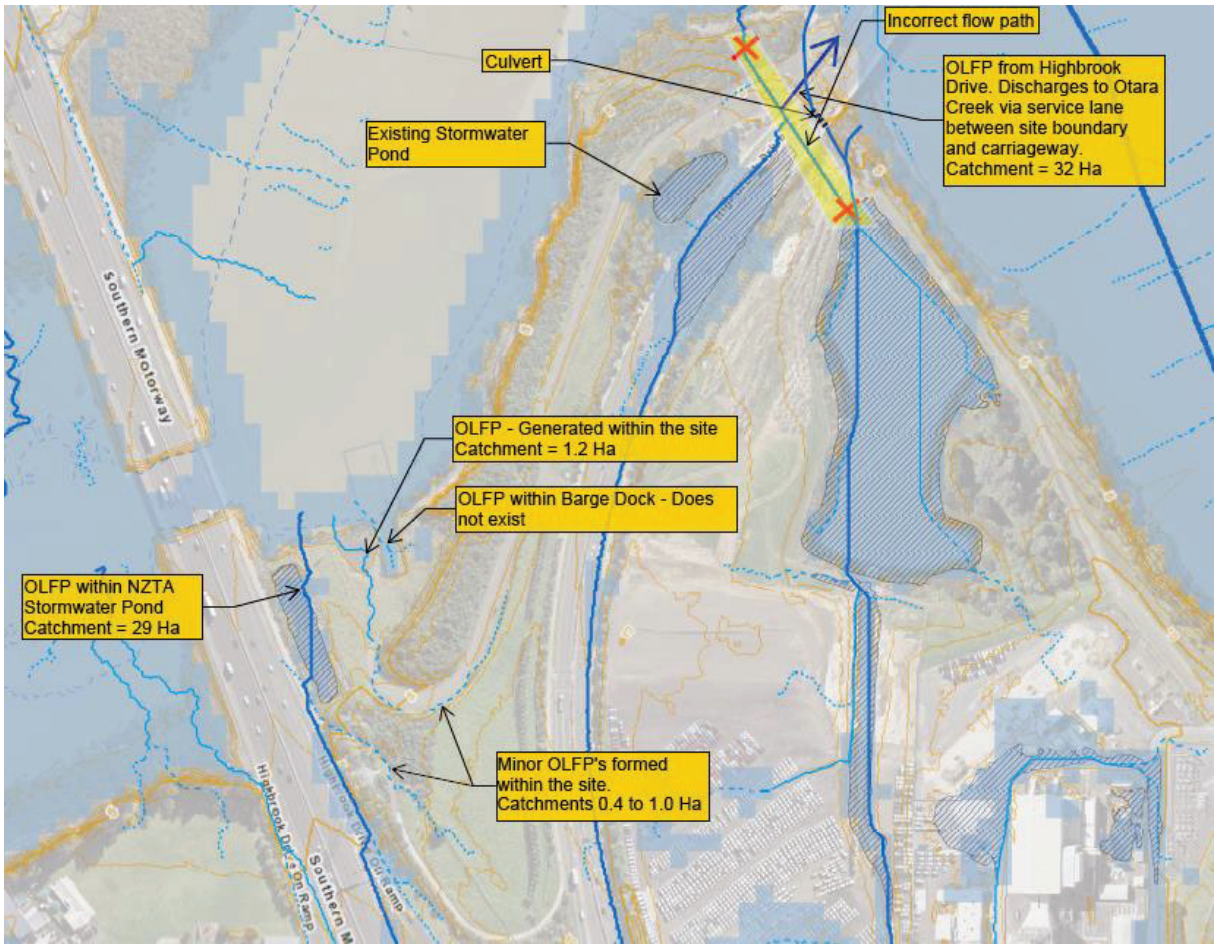


Figure 10: Overland flow paths through the site

Once the pond is fully reclaimed, the overland flows are likely to flow through the box culvert underpass via an access track next to the pond discharging to the Ōtara Creek upstream of the weir (as shown in Figure 10). As such this overland flow path does not enter the site now are in the future.

Figure 11: Floodgate at the water-cooling pond outlet

1.9 Coastal inundation

The west boundary of the site is contiguous with the banks of the Tamaki River. The Auckland Council Technical Report 2020/024: *Auckland's Exposure to Coastal Inundation by Storm-tides and Waves* has calculated coastal inundation levels at two locations near the site. Table 1, below, summarises these results.

Table 1: Coastal Inundation Levels (*Auckland Council TR 2020/024*)

Site	0.01 AEP max. storm-tide plus wave set up elevations	0.01 AEP max. storm-tide plus wave setup elevations, with inferred wave setup component subtracted
Tāmaki Estuary at the mouth of Pakuranga Creek (downstream of the site)	RL 2.42m	RL 2.32m
Tāmaki Estuary near Lansdown Avenue (Upstream of the site)	RL 2.46m	RL 2.36m

By linear interpolation, the 1% AEP (0.01 AEP) maximum storm-tide plus wave setup elevation with inferred wave setup component subtracted at the site is estimated to be RL 2.34 m. This results in a small portion of the site in the vicinity of the barge dock and the northern tip of the site that is at RL 2.0 m gets inundated by up to 340 mm (0.34 m) during a 1% AEP event. Therefore, the future habitable floor levels of buildings within this part of the site need to be higher than RL 3.34 m. As per the Development Concept Plan, for the site, the habitable floors are expected to be along the eastern, southern and south-western boundary of the site where the general ground level is substantially above RL 3-8 m. The details pertaining to the finished ground levels of buildings will be refined at the time of applying for Resource Consents.

Figure 12: Extent of coastal inundation.

1.10 Biodiversity

Historic aerials (Auckland Council GeoMaps, Retrolense) illustrate that the site was cleared of all vegetation for farming except for a small amount of coastal fringe vegetation (1940, 1959, 1960). The site was further modified with the addition (1967) and removal (between 2001 and 2003) of power generation plant and access roads. This was followed by the construction of Highbrook Drive (2006) and subsequent landscape planting.

The vegetation on the site is currently a mix of rank grass, native plantings (flax, five finger, pōhutukawa, cabbage tree, kānuka), exotic trees (macrocarpa, poplar, pine) and exotic weed species (tree privet, pampas, wattle), transitioning to mangroves in the Coastal Marine Area (CMA). Although the area of native plantings near the coast are now well established, they are comprised of common native species, and area strongly influenced by weed species.

1.11 Cultural and heritage sites

The Auckland Council GeoMaps does not identify any cultural and heritage sites being present within the site.

1.12 Contaminated land

The site and surrounding area were pastureland until the part of the site and land to the southeast was developed for the Ōtāhuhu Power Station in the late 1960s. Two large circular tanks, in a large rectangular earth bund, associated with the power station were installed across the southeast boundary in 1967. In the late 1960s and 1970s, an area in the southwestern corner of the site, adjacent to the Tamaki River, was reclaimed. The source of the fill is unknown. A barge dock and long jetty stretching into the Tamaki River were constructed in this reclaimed area by 1979. A rectangular feature was present in the southwestern corner of the site in 1979/1980 but had been removed by 1988. The two circular tanks had been removed by the early 2000s at which time significant earthworks were undertaken in the southern and eastern part of the site and the land to the south and east, for the construction of Highbrook Drive.

The northern part of the site appears to have been used as a construction yard during this time. The road construction works were completed by 2010. There has been no significant changes at the site since 2010. It is possible that contaminated soil may be present in various locations at the site as a result of historical activities at the site and in the surrounding area. A detailed plan showing the historical activities included in Appendix A2.

2 Development summary and planning context

2.1 Proposed Development

The Plan Change Request seeks to rezone the site from Light Industry Zone to THAB Zone. The future development of the site will be required to align with the objectives, policies and rules framework of the THAB Zone.

The applicant has prepared a Development Concept Plan to illustrate one option for the future development of the site, aligning with the outcomes envisaged by the THAB Zone. The Development Concept Plan envisages approximately 500 houses on the site, based on an apartment typology. It is noted that development beyond 200 houses will need to be supported by a future Integrated Transport Assessment.

Future development of the site will require the vesting of esplanade reserve areas adjoining Tāmaki Estuary.

Figure 13: Concept Plan of the proposed development

2.2 Location and area

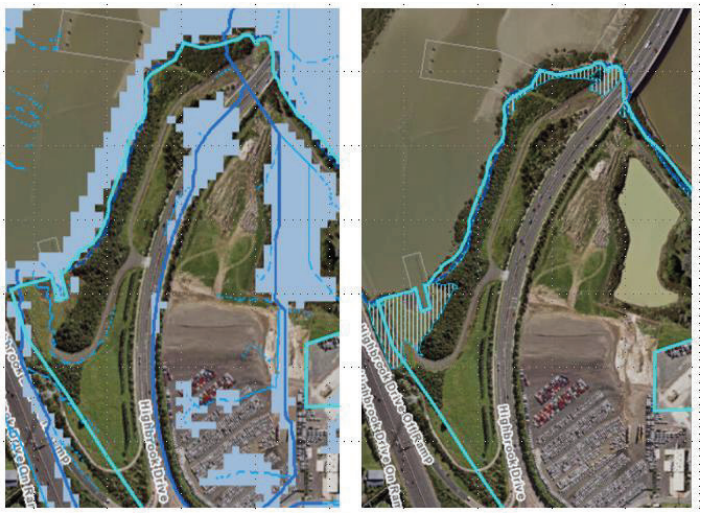
The site is a 4 ha (inclusive of the stormwater pond) part of 8 Sparky Road, Ōtara (shown in Figure 1) with a parcel ID 7534518. It forms a part of the former Ōtāhuhu power station site bound by Highbrook Drive to the south-east, Tāmaki Estuary to the north, Ōtara Creek Estuary to the Northeast, and the Southern Motorway to the west.

2.3 Earthworks

Detailed development design plans will be confirmed in the future at the time of lodging of the resource consent application, which will include the volume and area of the site to be

earth worked. Development of the site will require a main spine road to be formed and building platforms will be created to compliment the topography of the site.

2.4 Regulatory and design requirements

Requirement	Relevant regulatory / design to follow
Unitary Plan – SMAF hydrology mitigation	• The site is not subject to the SMAF overlay
High Contaminant Generating Areas	• Chapter E9 of the AUP(OP) will be relevant at the land development stage, given that residential development generally utilises car parks and manoeuvring areas that are likely to meet the threshold for this activity. The provisions of Chapter E9 and relevant policies of Chapter E1 (Water quality and integrated management) are noted and utilised in BPO for stormwater management.
Natural Hazards	• Chapter E36 of the AUP(OP) sets out the provisions relating to natural hazards and flooding. Auckland Council's GeoMaps (Figure 14) indicates overland flow paths, the 1 percent annual exceedance probability (AEP) floodplain, and the coastal storm inundation 1 per cent AEP area are present within the site. The provisions of Chapter E36 are used to inform the BPO for stormwater management.  Figure 14: Auckland Council GeoMaps - Floodplain & overland flow paths (left) and Coastal Inundation Control (right)
Auckland Unitary Plan Precinct	• N/A
Existing Catchment Management Plan	• The Auckland Council's GeoMaps show the site to be a part of the Ōtara Creek/Flat Bush catchment. At the time of writing this SMP, Healthy Waters

Requirement	Relevant regulatory / design to follow
	confirmed that currently there is no SMP or CMP for this catchment.

Auckland Council Regionwide Network Discharge Consent	• The Regionwide Stormwater Network Discharge Consent No. DIS60069613 is applicable.
	• Developers who wish to have the stormwater diversion and discharge associated with their proposal authorised by the NDC need to demonstrate that connection requirements under Schedule 4 are met.
	• The connection requirements for Brownfield (large) are applicable to this proposal.
	• Integrated stormwater management approach in accordance with the policies set out in E1, B7, and B8 of the AUP(OP) to:
	  ○ Minimise stormwater related effects
	  ○ Retain/restore natural hydrology as far as practicable
	  ○ Minimise generation and discharge of contaminants and stormwater flows at source
	  ○ Minimise temperature related effects
	  ○ Enhance freshwater systems, including streams and riparian margins
	  ○ Minimise the location of engineered structures in streams
	  ○ Protect the values of SEAs as identified in the AUP(OP)
	• WATER QUALITY: Where discharge is to degraded or sensitive aquatic environment, treatment of all impervious areas by water quality device designed in accordance with GD01/TP10. Figure B7.4.2.1 identifies the Tāmaki Estuary as a degraded environment (Coastal Degraded 1).
	• Alternatives to water quality measures may be determined through an SMP that applies an Integrated Stormwater Management approach; meets Schedule 2 of the NDC; and is the best practicable option.
	• ASSETS: New assets to become part of the public network to meet the required level of service for the life of the asset. Vesting is subject to any required approvals under Stormwater Bylaw, and the Stormwater Code of Practice. Assets in the road corridor require approval from Auckland Transport.

3 Mana whenua: Te ao Māori and mātauranga

3.1 Identification and incorporation of mana whenua values

Four mana whenua groups acknowledged interest in the PC site, these groups were Ngāti Te Ata, Ngāti Tamaoho, Te Ākitai Waiohua and Ngāi Tai Ki Tāmaki. Consultation is on-going, with all four groups agreeing to provide a Cultural Values Assessment (CVA). A summary of the consultation is in the table below:

Mana Whenua Group	Summary of Consultation
• Ngāti Maru Rūnanga • Ngāti Tamaterā • Ngāti Whanaunga • Te Ahiwaru – Waiohua • Ngāti Pāoa • Waikato - Tainui	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. No interest was registered.
Te Kawerau ā Maki	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. Response received on 4 November 2021, confirming that Te Kawerau ā Maki have shared ancestral interests in the PC area and have extremely high cultural sensitivity in relation to the awa and the shoreline. Te Kawerau ā Maki deferred to their whanaunga Kaitiaki to respond to and lead input into the PC Request: Ngāti Pāoa, Te Ākitai Waiohua and Ngāti tai ki Tāmaki.
Ngāti Te Ata	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. A meeting with Ngāti Te Ata's representative was held on 13 December 2021, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The applicant is committed to ongoing consultation with Ngāti Te Ata.
Ngāti Tamaoho	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua.

	A meeting with Ngāti Tamaoho's representatives was held on 13 December 21. An overview of the plan change was provided. Ngāti Tamaoho has prepared a Cultural Values Assessment (Technical Report 10 in Appendix 4). The applicant is committed to ongoing consultation with Ngāti Tamaoho.
Te Ākitai Waiohua	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. On 22 March 2022, a site walkover meeting was held with Te Ākitai Waiohua's representative, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The applicant is committed to ongoing consultation with Te Ākitai Waiohua.

A CVA has been prepared by Ngāti Tamaoho (Technical Report 10, Appendix 4). The report identifies the following key stormwater management matters:

- GD01 and GD04 stormwater guidelines are supported as appropriates means in stormwater mitigation;
- Use of low impact green stormwater infrastructure, reuse of clean roof water for non-potable reuse, capture for reuse of rainwater;
- Treatment train approach to all accesses and road runoff, including the use of enviro pods or similar within internal cesspits;
- Native riparian planting of 10 meters along waterways; and
- Creating a 'mana o te wai' plan to ensure the health of Te Wai O Taiki and Waitematā is not only maintained but increased.

In terms of addressing the above matters, the SMP has addressed water quality treatment of all impervious areas by recommending water quality device designed in accordance with GD01, along with other methods outlined for the management of stormwater systems to ensure comprehensive Water Sensitive Design (WSD) as outlined in GD04.

Pertaining to those other key matters, the client will meaningfully engage with Ngāti Tamaoho governance and kaitiaki in meeting the recommendations outlined above. Further investigation will be given to those matters forming part of the detailed design phase.

Furthermore, the applicant is committed to ongoing discussions and consultation with all four mana whenua groups in relation to cultural heritage values, and the effects on Wai O Taiki (Tāmaki River).

4 Stakeholder engagement and consultation

The area subject to the Private Plan Change Request is deemed to be brown-field land. The wider consultation undertaken in respect of the Plan Change is set out in the Statutory Assessment Report. The applicant is committed to undertaking further consultation with mana whenua groups and key stakeholders as part of the continued processing of this Plan Change Request. The applicant is also committed to undertaking further consultation with the key stakeholders (including Auckland Council and mana whenua) as part of the detailed design process at the land development stage. Refer to the table below summarising consultation with the key stakeholders.

Key stakeholder/ Organisation	Summary of Consultation
Tāmaki Estuary Protection Society	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Tāmaki Estuary Protection Society on 21 March 2022. The following key matters were raised: • concerns regarding potential contaminants in the Tāmaki River and Ōtara Creek. • Concerns regarding effects of the PC on the roosting of the shorebirds. In response to the concerns raised, the Ecological Assessment Memo was updated to include consideration of effects on the coastal bird species using the weir at the mouth of the Ōtara Creek (where it flows into Tāmaki Riaver) for roosting.

	In response to the concerns regarding contamination matters, a Land Contamination Review Report was prepared to identify current or historical potential for contamination sources in the PC area.
Greater East Tamaki Business Association (GETBA).	Letter provided with an overview of the Plan Change Request, including attachments of maps on 3 March 2022. A meeting was held with the representatives of the GETBA on 29 March 2022. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Requested that all existing cameras used for crime prevention adjacent to underpass remain. The information relating to the location of existing crossings was provided on 31 March 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Ōtara Waterways & Lake Trust	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Ōtara Waterways & Lake Trust on 4 April 2022. The following key matters were raised: • Concerns regarding existing signalised crossings and the new proposed access.

	• Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Concerns regarding the number of car parks and capacity within the development. • Requested information on Mana Whenua groups being consulted. The information requested was provided on 20 April 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Goodman Property Trust (Goodman)	A meeting was held with the representatives of Goodman on 28 March 2022 to provide an overview of the PC Request. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Need to ensure that the proposed residential development is of a high quality noting its location at the entrance to Highbrook Business Park, an area of significant investment for Goodman. The ITA was provided to Goodman on 7 July 2022 for review by their independent specialists.
Ōtara-Papatoetoe Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 2 March 22. An overview of the PC was provided to the Ōtara - Papatoetoe Local board in their workshop meeting on 26 April 22. The Board as interested it the following key matters: • The type of housing to be developed. • Interested to know whether there would be any social procurement schemes to allow public to participate in landscaping/ design or communal gardens.

	• Requested that the PC incorporate greenways in providing connectivity to the PC area. Ōtara-Papatoetoe Local Board will review the PC Request when lodged via the statutory process.
Howick Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 02 March 22. The Howick Local Board declined the request for a meeting, as comments of the Board are to be provided following the lodgement of the PC Request via the statutory process.
Waka Kotahi and AT	Multiple meetings have been held with Waka Kotahi and AT representatives to discuss the various aspects of the PC Request, including: • Need for future development within the PC area to secure access to Waka Kotahi's stormwater pond adjoining the PC area. The applicant agrees that this will be provided at the land development phase. • Noting the proximity to SH1 and Highbrook Drive, the PC should consider potential elevated noise environment and need for noise mitigation. The applicant agrees with this request, and has proposed noise mitigation measures in the PC Request. • Need for an ITA to assess traffic effects on the SH1 and Highbrook interchange and the other roads in the proximity of the PC area. The draft ITA was provided to Waka Kotahi and AT for review prior to lodgement. Feedback received was incorporated into ITA submitted with the PC Request. The findings and recommendations of the ITA have been incorporated into the PC Request. • Need to illustrate that the current zoning of the site is unable to be utilised for its intended purposes.

Transpower New Zealand	A meeting with Transpower's representative was held on 3 September 2021. The key following matters were discussed: • There are no concerns in relation to the effects of the PC on the Ōtara Substation given the separation distance between the two. • Ensure that there is no development proposed underneath the National Grid infrastructure. • Ensure that the proposed development does not restrict access to the National Grid Tower beside the PC area. The applicant agrees that access to the Tower will be provided at the land development stage. The applicant is committed to consulting with Transpower at the land development phase.

5 Stormwater management

5.1 Principles of stormwater management

Auckland Council GeoMaps show the site to be within the Ōtara catchment. Healthy Waters has confirmed that, currently the Ōtara catchment does not have a Stormwater Management Plan (SMP) or Catchment management Plan (CMP). Therefore, guidance for stormwater management in this site cannot be drawn from a SMP/CMP for the wider catchment this site is in. Notwithstanding that, the stormwater management assets will be vested in Auckland Council following the development of this site. Therefore, stormwater management system designed for this site will need to meet the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent (NDC) that the Auckland Council holds.

The connection requirements outlined in Schedule 4 of the NDC for brownfield developments include:

1. Water Quality: Treatment of all impervious areas by a water quality device designed in accordance with GD01/TP 10 for the relevant contaminants.

2. Stream Hydrology: Where discharge is to a stream via public stormwater outside of SMAF – meet SMAF 1/SMAF 2 requirements.

3. Flooding:
    1. Ensure there is sufficient capacity within the pipe network downstream of the connection point to cater for the additional stormwater runoff associated with the development in a 10% AEP event.
    2. Demonstrate that flows in excess of the pipe capacity in a 10% AEP event within the pipe network downstream of the connection point will not increase adverse effects on any other property.

4. Buildings – 1% AEP event: Manage/mitigate 1% peak flows to that immediately preceding development/redevelopment.

The requirements of stormwater management for this site in the order of priority is as follows:

1. ***Provision of quality stormwater infrastructure*** – It is vital to provide quality stormwater infrastructure to maintain healthy waterways and to mitigate risks to our communities, people and property. Moreover, quality stormwater infrastructure ensures that the strategic objectives and the connection requirements under the NDC are met.

2. ***Water quality management*** – The section of Tāmaki Estuary and the Ōtara Creek in the vicinity of the site is within the Hauraki Gulf catchment area. SEA areas are mapped upstream of the site and on the far bank of the Tāmaki Estuary (opposite

side of the subject site). Therefore, maintaining or improving the water quality in the Tāmaki Estuary and Ōtara Creek is a priority of the stormwater system for this site.

3. ***Mitigation of erosion at the outfall and protection and protection/enhancement of the SEA*** – Currently, there is no known coastal erosion along the banks of Tāmaki Estuary in the vicinity of the site. It is important to maintain this condition post development. Therefore, the stormwater system proposed for this site needs to protect and enhance the banks of the Tāmaki Estuary.

4. **Managing flows in excess of the pipe capacity i.e., secondary flows** – Managing flows in excess of pipe capacity protects people, properties and our communities in storm events in excess of 10% AEP. This also mitigates the risk of flooding of habitable floors during major storm events. Therefore, the stormwater management system for this site needs to provide a 10% AEP storm event level of service.

5. ***Mitigating risk of 1% peak flows having adverse impact on development/redevelopment*** – The habitable floors in this site need to be above the coastal inundation level calculated for this site to mitigate the exposure of the development to climate change impacts and flooding during major storms. This measure, in conjunction with managing secondary flows will provide a satisfactory level of protection to habitable floors in future buildings on this site.

The site is located at the bottom of the Ōtara Creek catchment. Stormwater flows from this site discharge to the Tāmaki Estuary. The hydrological benefits of flow attenuation diminish substantially at the bottom of a catchment. In addition, there are no known flooding issues in the Tāmaki Estuary downstream of the site, nor are there any known coastal erosion issues in the vicinity of the site. Therefore, attenuation of flows is deemed unnecessary. Nonetheless, the topography and the nature of the development anticipated in the THAB Zone lends itself to incorporating rainwater harvesting within the site, which offer substantial benefits. This along with other methods outlined for the management of stormwater systems for this site, will result in comprehensive Water Sensitive Design (WSD) which is defined in GD04 as:

"*An approach to freshwater management, it is applied to land use planning and development at complementary scales, including region, catchment, development and site. Water sensitive design seeks to protect and enhance natural freshwater systems, sustainably manage water resources, and mimic natural processes to achieve enhanced outcomes for ecosystems and or communities*".

Integrated approaches such as WSD minimise the adverse effects of growth and development on freshwater systems and coastal waters. It is Auckland Council's preferred stormwater management approach. Therefore, the future development of the site should explore options to harvest rainwater on this site.

The strategic objectives of the NDC applicable for this site include:

1. *Healthy and connected waterways that provide for te mauri o te wai: Stream, groundwater and coastal water values are maintained and enhanced and communities are connected with them.*

2. *Support growth through water sensitive development and provision of quality stormwater infrastructure is enabled.*

3. *Risk to our communities, including people, property and infrastructure is reduced.*

The principles of stormwater management outlined in this section will assist the future development to comply with the strategic objectives mentioned above.

5.2 Proposed stormwater management

The objective of this Stormwater Management Plan is to outline the principles to ensure that the connection requirements and the strategic objectives of the NDC are met. A detailed design of the future stormwater management system will be developed at the time of applying for Resource Consents.

5.2.1 General

A new stormwater management system will replace the current stormwater management system on site comprising of table drains, a 300 mm stormwater culvert across the gravel road and a catchpit. The new stormwater system will be a piped stormwater reticulation system with suitable stormwater treatment devices that comply with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. A detailed design of this stormwater management system will be developed in the future to support the Resource Consent application. Once implemented, this new stormwater management system will service all buildings, impervious areas, and some permeable areas i.e., these areas will be 'connected'. The remainder of the pervious areas (less than 30% of the total site) viz., including the area of the future esplanade reserve, will remain 'unconnected' thereby draining directly to the Tāmaki River.

5.2.2 Water quality

The proposal is to treat stormwater from the entire site using new treatment devices that are designed to comply with GD01/TP10. The existing stormwater pond that treats runoff from a small area (0.9ha) of Highbrook Drive (refer to Figure 1) will need to be decommissioned to enable development within this portion of the site. To enable decommissioning this pond, the proposal is to combine the treatment of runoff from the subject section of Highbrook Drive with that from the site in device(s) to be constructed. Once vested in Auckland Council, this will reduce the operation and maintenance requirements for one treatment pond.

The water quality volumes that we have calculated for the maximum probable development (MPD) within the site is included in Appendix C2.

While the detailed design of the water quality pond is to be undertaken at the time of the Resource Consent application, we have completed a preliminary, high-level assessment of the stormwater treatment volumes. Based on this assessment, a total of 765 m^3 of runoff

will need to be treated, comprising 157 m^3 generated by the Highbrook Drive catchment and 608 m^3 from the site itself.

The proposed development plan and the topography of the site allows for the following four options for stormwater treatment:

1. A wetland (or a coastal wetland) constructed in conjunction with the creation of the esplanade reserve along the banks of the Tāmaki estuary.
2. Two stormwater treatment ponds or proprietary treatment devices (viz., Stormfilters) at both ends of the site to treat approximately half the site in each device.
3. Raingardens constructed along the proposed road.

Raingardens (Option 3) are not preferred, owing to operation and maintenance requirements and Auckland Transport's preference to not have them in the road corridor. Therefore, options 1 or 2 are recommended for this site. A concept plan of stormwater treatment options is set out in Appendix C1.

5.2.3 Flooding 10 percent AEP event (Network Capacity)

A detailed design of this stormwater management system will be confirmed in the future at the land development stage to support the Resource Consent application. This new stormwater system will be a piped stormwater reticulation system that complies with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. As such, the network will have adequate capacity to convey 10% AEP event flows. The overland flows will be along the roads to be formed. No secondary flow structures viz., culverts are deemed necessary.

Our review of the Auckland Council's GeoMaps has confirmed that there are no flood prone/flood sensitive areas along the Tāmaki Estuary downstream of the site during 10% AEP or 100% AEP events. The only flood prone location in the vicinity of the site is a localised depression along Highbrook Drive next to the treatment pond. Based on our site inspection, should the flood waters overtop the kerbs, this area will drain to Ōtara Creek via the service road bypassing the site.

5.2.4 Flooding 1 percent AEP event (Habitable floors)

As discussed in the previous section of this report, this site or the properties along the banks of Tāmaki Estuary downstream of the site, are not flood prone nor flood sensitive. Only a small portion of the site in the vicinity of the barge dock (on the western side of the site) and the northern tip of the site that are at RL 2.0 m are expected to get inundated by 0.34 m during a 1% AEP event. The future development of the site will be carefully designed to ensure that habitable floors are not proposed in the section of the site that is prone to inundation.

5.2.5 Overland flowpath and floodplain management

As discussed in section 1.8 of this report, there are no overland paths entering the site from neighbouring properties. The two overland flow paths in the site coincide with the table

drains along the existing gravel roads. The future road network for this site is able to be aligned with the existing gravel roads. As such the overland flow paths within the site can remain largely unchanged after the development. Moreover, future development on the site is not expected to affect downstream properties by way of new or altered overland flow paths as the stormwater runoff discharges directly to the Tāmaki Estuary.

5.3 Hydraulic connectivity

The post-development stormwater management system proposed for this site comprises of a pipe network and treatment devices. The pipe network to service the site will be independent of the existing Auckland Council's stormwater network because of the site's location in relation to existing Auckland Council stormwater network. Stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. As such, the hydraulic connectivity will be directly to the Tāmaki Estuary flows.

The time of concentration (ToC) for the flows from the site will be significantly less than the ToC for the flows in Tāmaki Estuary or the Ōtara Creek in the vicinity of the site.

5.4 Asset ownership

The proposal is to vest the entire stormwater management system to be developed for this site, in Auckland Council. The future asset ownership will be with Auckland Council.

5.5 Ongoing maintenance requirements

The stormwater management system for the site will be designed in the future at the land development phase. Details of ongoing maintenance requirements will be outlined in the Resource Consent stage. Notwithstanding that, the stormwater management proposed for the site will comprise of a pipe network and stormwater treatment device(s) that comply with the requirements of GD01 and the Stormwater Code of Practice Version 3. As such, no bespoke operation and maintenance requirements are envisaged. They will be consistent with the operation and maintenance requirements of the wider Auckland Council stormwater network.

5.6 Implementation of stormwater network

The stormwater network to service the site will be implemented in the future at land development stage.

5.7 Dependencies

As discussed earlier, the pipe network to service the site will be independent of the existing Auckland Council's stormwater network due of the site's location in relation to the existing Auckland Council stormwater network. Stormwater flows from the site discharge directly into Tāmaki Estuary after treatment. As such, it is not dependent on the implementation or upgrade of the Auckland Council's current stormwater network.

It is proposed to decommission the existing stormwater treatment pond that services 0.9ha of a section of Highbrook Drive. This can be decommissioned only after a suitable device to

treat the stormwater flows from the site and the subject section of Highbrook Drive is constructed. This is the only dependency that is envisaged.

5.8 Risks

No risks to the wider Auckland Council stormwater management system is envisaged from the proposed plan change or the future development of the site.

6 Departures from regulatory or design codes

There are no departures proposed as part of this Stormwater Management Plan.

7 Conclusions and recommendations for future work

[insert chapter introduction statement here]

7.1 Conclusions

The principles outlined for the proposed stormwater management system is consistent with the objectives of the NDC. The proposed stormwater management system meets the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent (NDC) that the Auckland Council holds. There are no departures from the Auckland Council Code of Practice or the connection requirements of the NDC.

Changing the zoning from Light Industry to THAB will have a lesser impact on the environment from the perspective of stormwater management. Under the AUP(OP), the maximum permissible impervious area in the THAB Zone is less than that in the Light Industry Zone. This will result in reduced stormwater runoff volume and peak flows into the receiving environment. Rezoning the land as proposed will not result in any material difference in water quality, as in both cases, runoff will need to be treated to comply with the guidelines in GD01/TP10 and conditions of the Network Discharge Consent (NDC).

Establishing a combined treatment facility for the site and subject section of Highbrook Drive (currently being treated in a separate pond), will reduce maintenance requirements for Auckland Council. The opportunity to create wetland along the bank of the Tamaki Estuary will result in high level of amenity for the public, similar to the stormwater treatment facilities in the Highbrook Business Park further north along Highbrook Drive.

Rezoning as proposed has the potential for improvements both in the short term (establishment of an Esplanade Reserve area) and the long term (residential amenity). Establishment of an Esplanade Reserve in the future will provide public access and amenity, with ongoing maintenance of the coastal vegetation. In addition, residential development offers greater opportunities for planting, maintenance and enhancement of the main part of the site, as well as the coastal area.

7.2 Recommendations

Our recommendation is that the subject site, being part of 8 Sparky Road, Ōtara with a parcel ID 7534518, be rezoned for residential development. We also recommend disestablishing the current stormwater pond that treats 0.9ha of Highbrook Drive in favour of a combined treatment facility.

Appendix A1 – Site Plan

Appendix A - Sheet 1
Site Plan

Babbage

Babbage Consultants Limited
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Auckland 1140, New Zealand
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CLIENT / PROJECT

Stonehill Trustees

Highbrook Private Plan Change

MAP TITLE

Map No 1. Site Plan

MAP REVISIONS

15/10/2021	Initial version by TT.

Legend

- Highbrook Site Boundary
- Contours Line (RL)
  - 0.5

NOTES
Aerial Images - LINZ Basemap

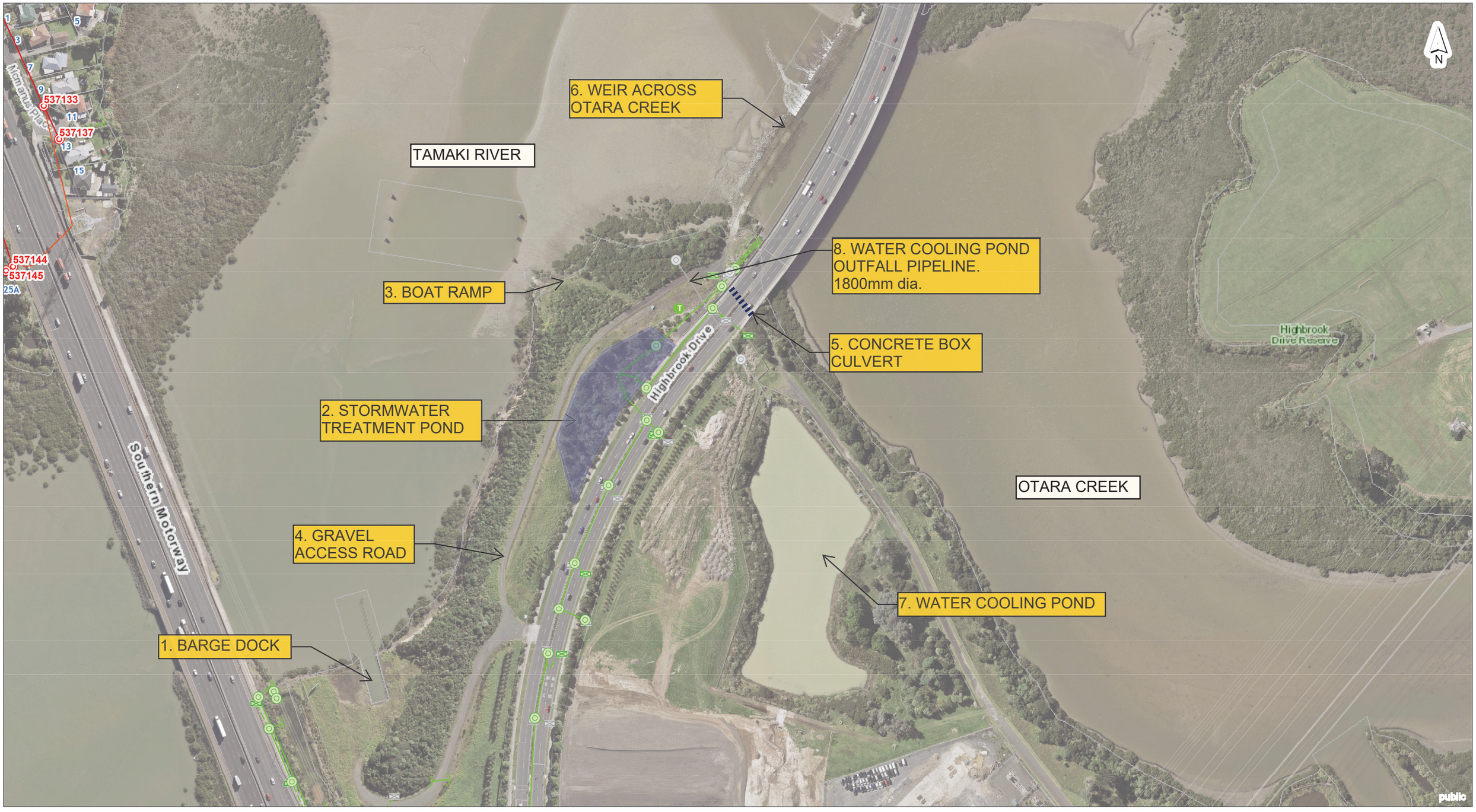
DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 @ A3

MAP NO.

64872#BEE02 01



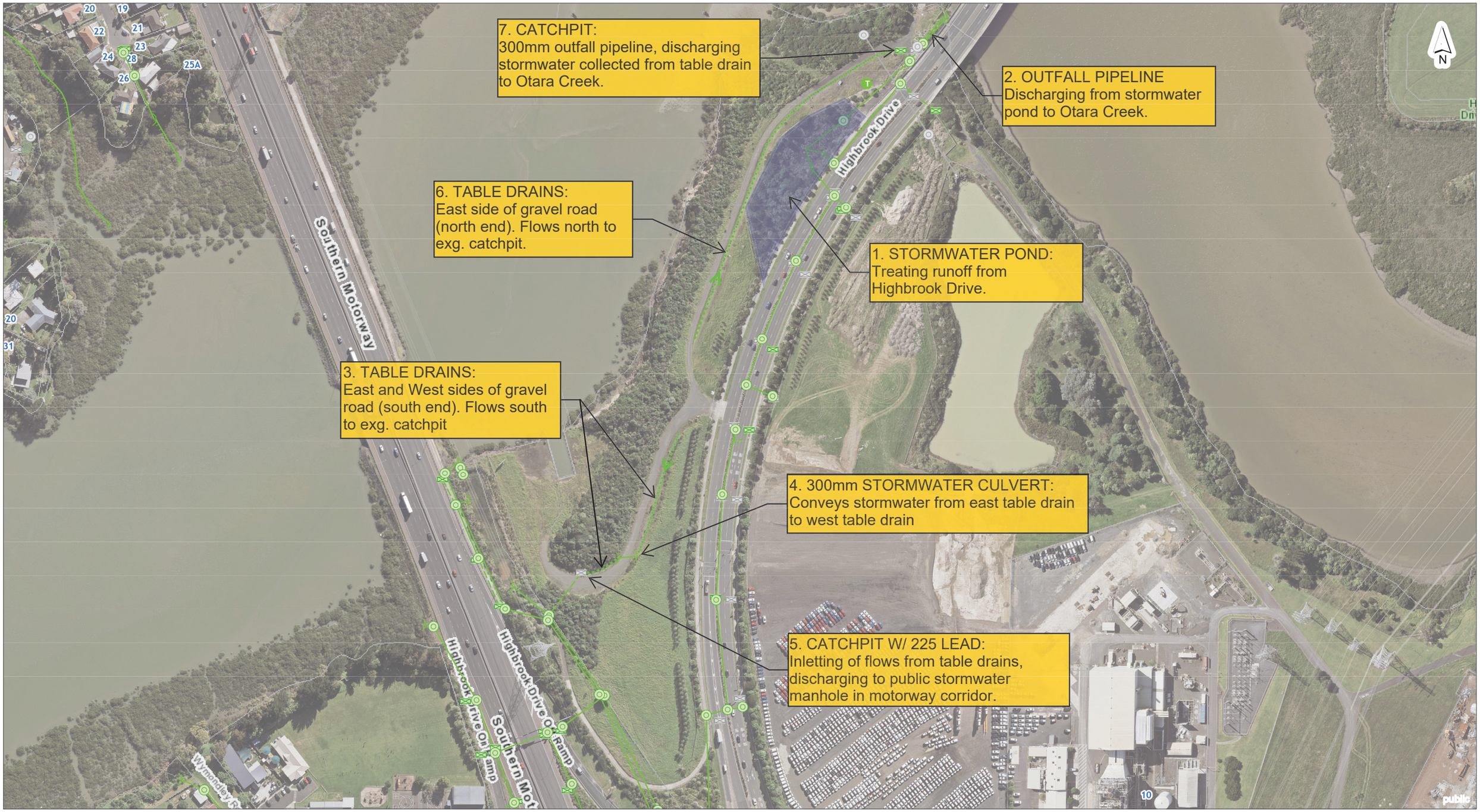
Appendix A - Sheet 2
Existing Site Features Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
22/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau



Appendix A - Sheet 3
Existing Drainage Features Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
16/11/2021

Auckland Council
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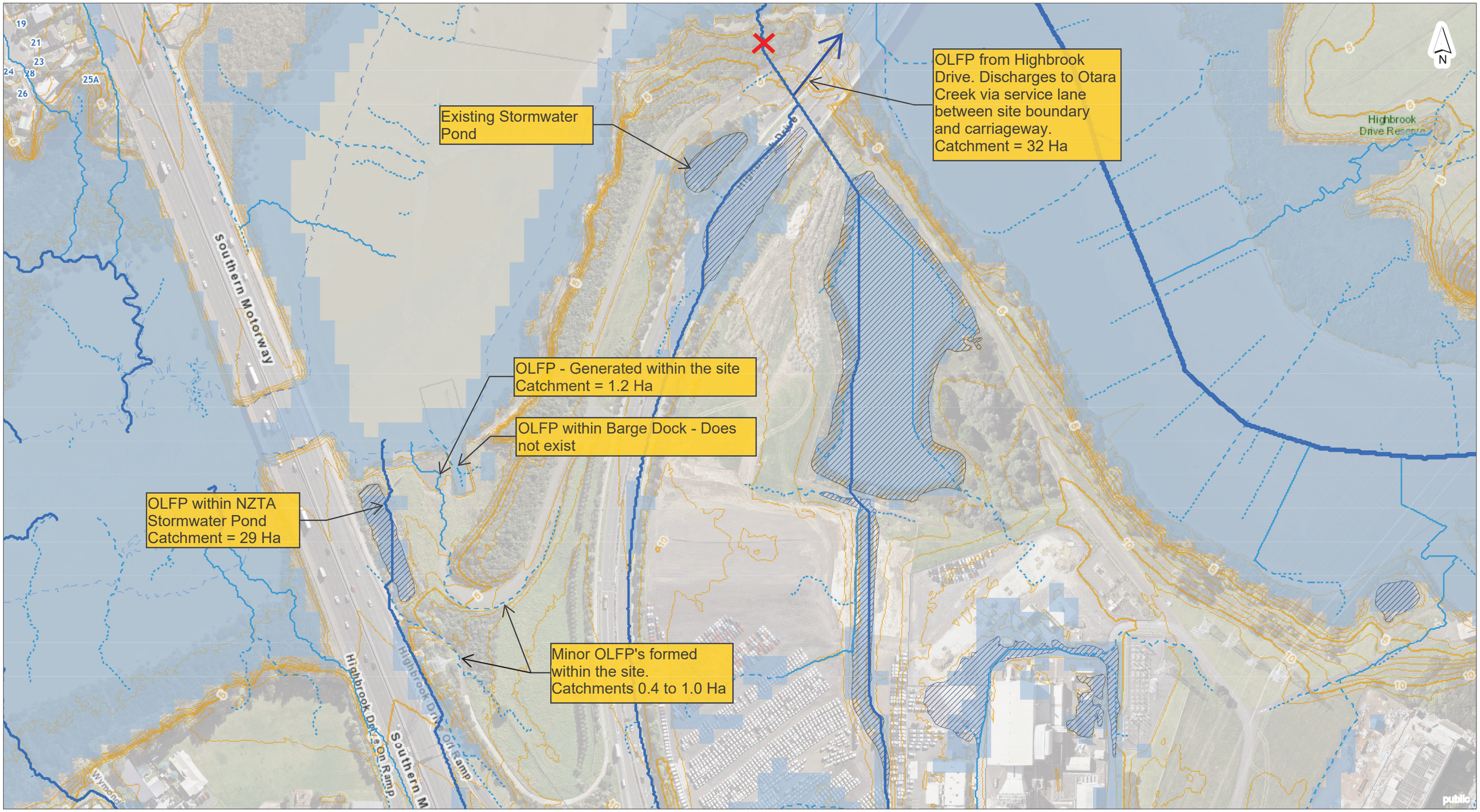


Appendix A - Sheet 4
Flood Hazards Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
23/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A - Sheet 5
1%AEP Coastal Inundation Plan

0 25 50 75
Meters

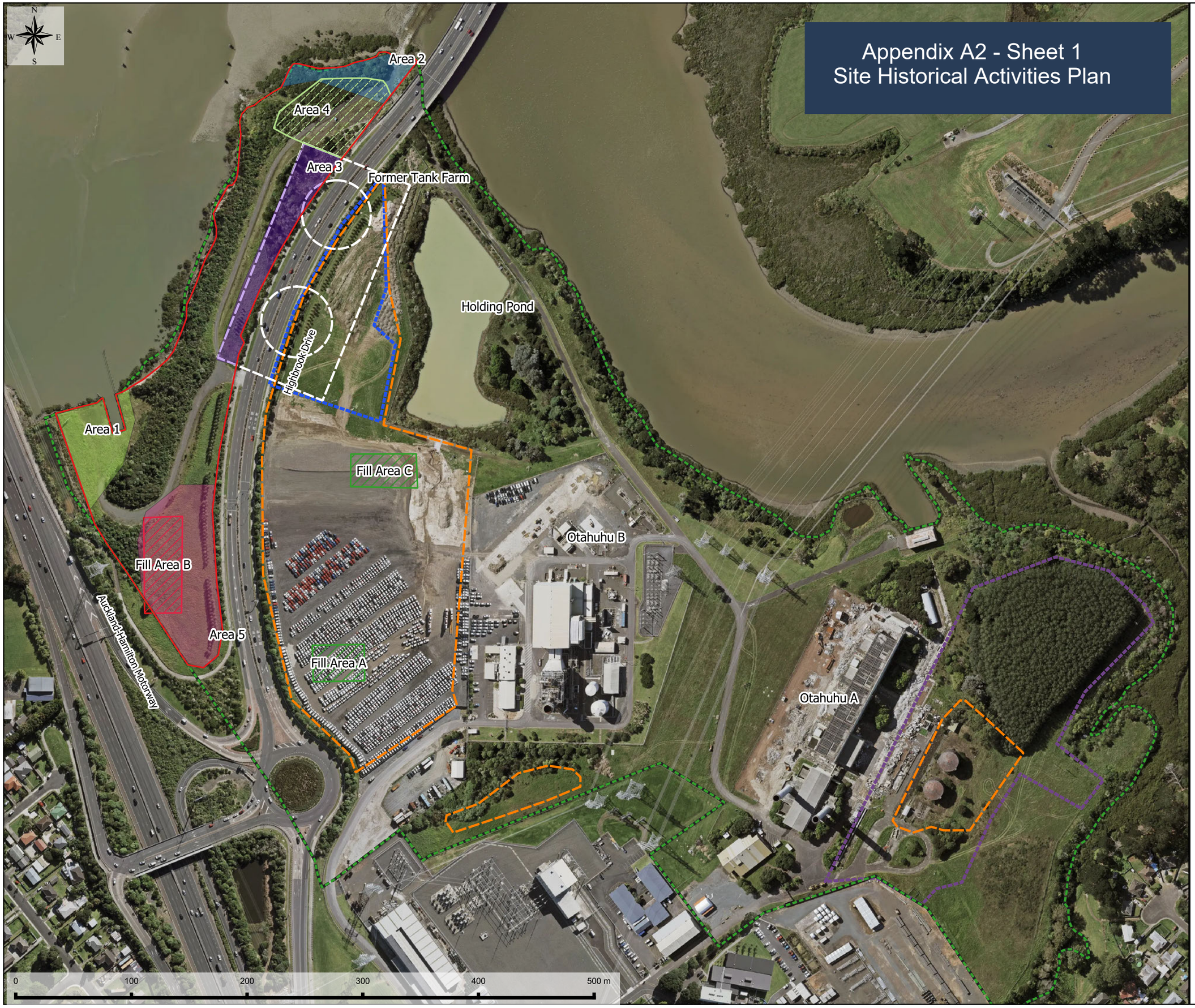
Scale @ A3
= 1:2,500

Date Printed:
24/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A2 – Site Historical Activities Plan

Appendix A2 - Sheet 1
Site Historical Activities Plan



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CLIENT / PROJECT

Stonehill Trustees

Highbrook Private Plan Change

MAP TITLE

Map No 2. Former Investigations and Soil Disturbed Areas - Potential Contaminated Land

MAP REVISIONS

06/04/2022	Initial version by TT.

Legend

- 8 Sparky Road Site
- Highbrook Site Boundaries

Potential Contaminated Land Areas - Highbrook Site

- Area 1 - Reclamation (1969 - 1979)
- Area 2 - Reclamation (1967)
- Area 3 - Former Tank Farm (1967 - 2003)
- Area 5 - Former Construction Yard Area (2006)
- Area 4 - Soil/Fill Material Stockpiled (2006)

Former Intrusive Investigations

- Areas of T&T 2011 Investigation
- T&T 2011
- T&T 2011
- Not Investigated
- Area of GSL2018 DSI Investigation
- Area of GSL2019 Investigation

NOTES
Aerial Images - LINZ Basemap
Land Parcels - Auckland Council Geomaps

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 **@ A3**

MAP NO.

64872#BEE02 528

Appendix B – Proposed Development Architectural Plans

HIGHBROOK
LIVING DEVELOPMENT
CONCEPT PLAN

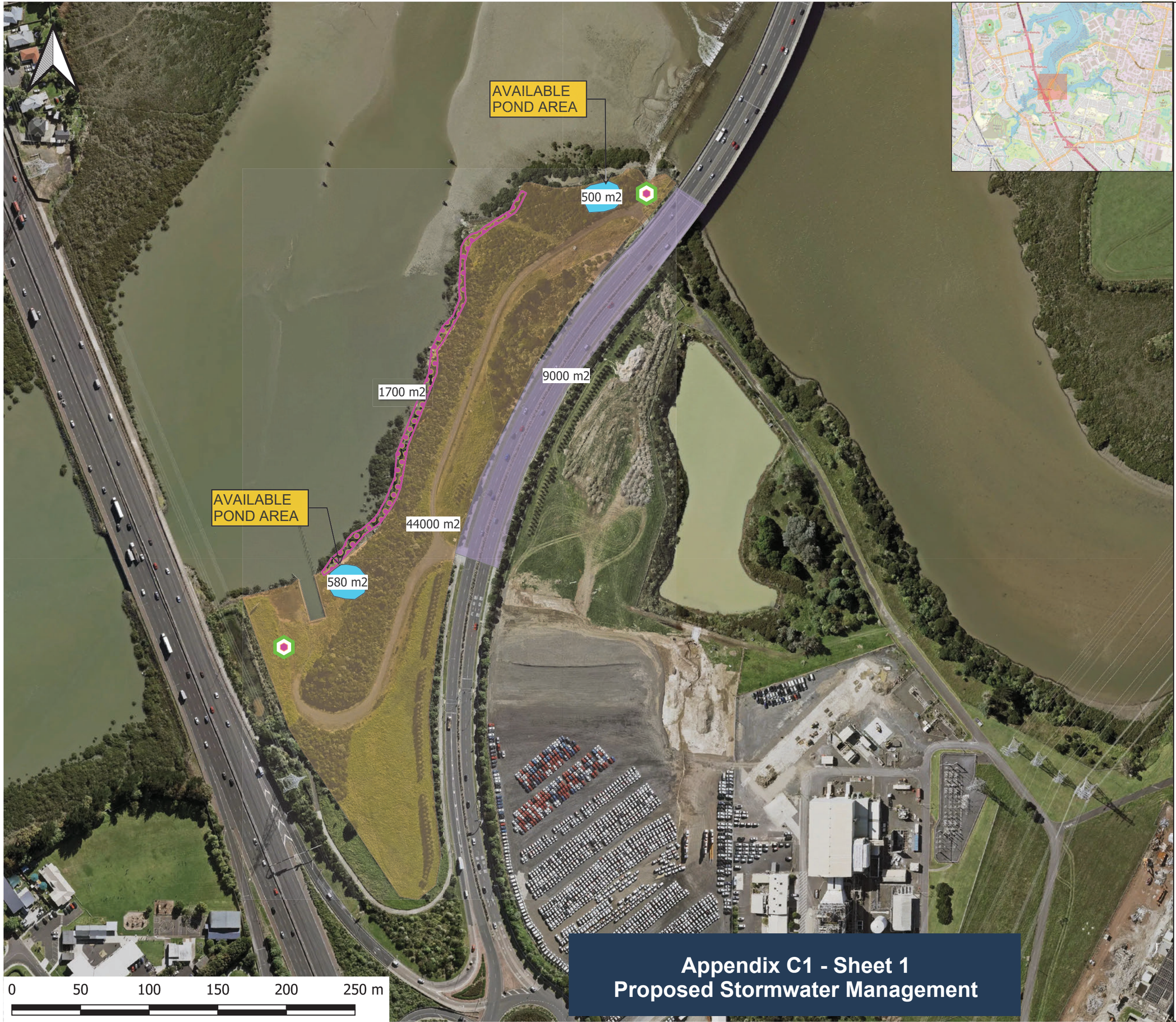
Key:

A Dairy
B Shared Office Facility
C Cafe
D Apartment Blocks -predominantly five storeys
E Terrace Houses
F Stand alone houses / Duplexes

BABBAGE CONSULTANTS

18 February 2022

Appendix C1 – Proposed Stormwater Management



Appendix C1 - Sheet 1
Proposed Stormwater Management

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CLIENT / PROJECT

Stormwater Management Plan
Highbrook Living

Terraced/Town housing Planning

MAP TITLE

Terraced/Town housing Planning in Highbrook

MAP REVISIONS

28/10/2021	Initial version by v1.

Legend

- Area-1 : 70% Impervious surface area
- Area-2 : 90% Impervious surface area
- Option 1- Wetland
- Option 2- Ponds
- Option 3- Proprietary SW treatment devices

NOTES

Mapped 21/10/2021 by Sundra Tatiparthi

SOURCES

1. Aerial photograph: LINZ Basemap, 2020
2. Road and boundary information: LINZ Data

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

@ A3

MAP NO.

Project No.	Map No.	Rev No.
64872	1	v1

Appendix C2 – Stormwater Runoff Calculations

JOB NAME:	Highbrook Living	**DATE:**	20.04.2022
JOB NO:	64872	**DES BY:**	MB
SUBJECT:	SW Runoff Calculation - Highbrook Drive	**CHKD BY:**	SK

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TP108 RUNOFF CALCULATIONS

◄◄◄ INPUT VALUES
◄◄◄ OUTPUT VALUES

1. PRE-DEVELOPMENT CATCHMENT:

Impervious Area	ha	0.7700
SCS Curve Number (CN)		98
Pervious Area	ha	0.1400
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	0.9100
% Impervious		85%

Catchment Slope (S_c)	m/m	0.01
Catchment Length (l)	m	350
Channelisation Factor (C)		0.6
Weighted Curve Number		94.3
Initial Abstraction (Ia) weighted	mm	0.769
t_c (For q* - TP108 Fig. 5.1)	hours	0.18
t_p (SCS Lag for HEC-HMS)	hours	0.12
Storage (S) Total	mm	15.3
Pervious	mm	89.2
Impervious	mm	5.2

Table 3.3 - Curve numbers for typical Auckland conditions

Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (mudstone/sandstone)
Bush, humid-climate, not-grazed	30	55	70
Pasture, lightly grazed, good grass cover	39	61	74
Urban lawns	39	61	74
Crops, straight rows, minimal vegetative cover	72	81	88
Scaled roads, roofs	98	98	98

Apply Climate Change to Pre-development Scenario? Yes Select Yes or No

Select appropriate design storm →			90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24})		mm	24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24})		mm	24	125	158	257
c*=(P24-2Ia)/(P24-2Ia+2S)			0.423	0.802	0.837	0.893
q* (from Fig. 5.1)			0.109	0.158	0.158	0.158
Peak Flowrate (q_p)		l/s	23.8	180.0	227.6	369.0
24 hour rainfall depth (Q_{24})	Pervious	mm	3	69	97	186
24 hour rainfall depth (Q_{24})	Impervious	mm	20	120	153	252
24 hour runoff volume (V24)	Pervious	m^3	4.7	96.7	135.9	260.5
24 hour runoff volume (V24)	Impervious	m^3	152.0	926.9	1181.6	1939.5
24 hour runoff volume (V24)	Total	m^3	156.6	1023.6	1317.5	2199.9

← *Refer TP108 - App A - Design Rainfall Maps*

← *Refer Stormwater Code of Practice - Table 4.1*

Auckland Council - Stormwater Code of Practice - Climate Change

Table 4.1: Percentage Increase in 24-hour Design Rainfall Depth

AEP	50%	20%	10%	5%	2%	1%
ARI	2 yr	5 yr	10 yr	20 yr	50 yr	100 yr
% Increase *	9.0%	11.3%	13.2%	15.1%	16.8%	16.8%

* in 24-Hour Design Rainfall Depth Due to Future Climate Change assuming 2.1°C increase in temperature

JOB NAME:	Highbrook Living	**DATE:**	20.04.2022
JOB NO:	64872	**DES BY:**	MB
SUBJECT:	SW Runoff Calculation - Site Only	**CHKD BY:**	SK

Babbage partners in excellence

TP108 RUNOFF CALCULATIONS

◄◄◄ INPUT VALUES
◄◄◄ OUTPUT VALUES

1. PRE-DEVELOPMENT CATCHMENT:

Impervious Area	ha	0.0000
SCS Curve Number (CN)		98
Pervious Area	ha	4.4000
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	4.4000
% Impervious		0%

Catchment Slope (S_c)	m/m	0.03
Catchment Length (l)	m	350
Channelisation Factor (C)		1
Weighted Curve Number		74.0
Initial Abstraction (Ia) weighted	mm	5.000
t_c (For q* - TP108 Fig. 5.1)	hours	0.27
t_p (SCS Lag for HEC-HMS)	hours	0.18
Storage (S) Total	mm	89.2
Pervious	mm	89.2
Impervious	mm	5.2

Table 3.3 - Curve numbers for typical Auckland conditions

Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (mudstone/sandstone)
Bush, humid-climate, not-grazed	30	55	70
Pasture, lightly grazed, good grass cover	39	61	74
Urban lawns	39	61	74
Crops, straight rows, minimal vegetative cover	72	81	88
Sealed roads, roofs	98	98	98

Apply Climate Change to Pre-development Scenario? No Select Yes or No

Select appropriate design storm →		90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24}) mm		24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24}) mm		24	N/A	N/A	N/A
c*=(P24-2Ia)/(P24-2Ia+2S)		0.073	0.370	0.421	0.541
q* (from Fig. 5.1)		0.020	0.088	0.097	0.116
Peak Flowrate (q_p) l/s		21.2	445.4	599.3	1120.1
24 hour rainfall depth (Q_{24})	Pervious mm	3	61	81	152
24 hour rainfall depth (Q_{24})	Impervious mm	20	110	135	215
24 hour runoff volume (V24)	Pervious m^3	146.7	2672.1	3576.0	6685.1
24 hour runoff volume (V24)	Impervious m^3	0.0	0.0	0.0	0.0
24 hour runoff volume (V24)	Total m^3	146.7	2672.1	3576.0	6685.1

← *Refer TP108 - App A - Design Rainfall Maps*
← *Refer Stormwater Code of Practice - Table 4.1*

2. POST-DEVELOPMENT CATCHMENT:

Impervious Area	ha	3.0800
SCS Curve Number (CN)		98
Pervious Area	ha	1.3200
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	4.4000
% Impervious		70%

Catchment Slope (S_c)	m/m	0.03
Catchment Length (l)	m	350
Channelisation Factor (C)		0.6
Weighted Curve Number		90.8
Initial Abstraction (Ia) weighted	mm	1.500
t_c (For q* - TP108 Fig. 5.1)	hours	0.17
t_p (SCS Lag for HEC-HMS)	hours	0.11
Storage (S) Total	mm	25.7
Pervious	mm	89.2
Impervious	mm	5.2

Auckland Council - Stormwater Code of Practice - Climate Change

Table 4.1: Percentage Increase in 24-hour Design Rainfall Depth

AEP	50%	20%	10%	5%	2%	1%
ARI	2 yr	5 yr	10 yr	20 yr	50 yr	100 yr
% Increase *	9.0%	11.3%	13.2%	15.1%	16.8%	16.8%

* in 24-Hour Design Rainfall Depth Due to Future Climate Change assuming 2.1°C increase in temperature

Select appropriate design storm →		90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24}) mm		24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24}) mm		24	125	158	257
c*=(P24-2Ia)/(P24-2Ia+2S)		0.669	0.922	0.937	0.961
q* (from Fig. 5.1)		0.148	0.162	0.163	0.164
Peak Flowrate (q_p) l/s		156.2	891.8	1135.2	1859.4
24 hour rainfall depth (Q_{24})	Pervious mm	3	69	97	186
24 hour rainfall depth (Q_{24})	Impervious mm	20	120	153	252
24 hour runoff volume (V24)	Pervious m^3	44.0	912.2	1281.1	2456.0
24 hour runoff volume (V24)	Impervious m^3	607.9	3707.5	4726.6	7757.9
24 hour runoff volume (V24)	Total m^3	651.9	4619.7	6007.6	10213.8

← *Refer TP108 - App A - Design Rainfall Maps*
← *Refer Stormwater Code of Practice - Table 4.1*

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Pages 537-568 redacted as per s42 order. Refer to direction 3 for more information.

APPENDIX 5

PLAN CHANGE 51 WAKA KOTAHI SECTION 32AA REPORT

Assessment of Plan Provisions to Provide for Human Health and Amenity in accordance with section 32 of the Resource Management Act

Interim Edition August 2021

VERSION 7

Table of Contents

Executive Summary

Waka Kotahi seeks a gradual reduction in health and amenity effects implemented as new activities are established or existing activities are altered in close proximity to the operational state highway network. This outcome aligns with *Toitū Te Taiao – Our Sustainability Action Plan*[1] which in turn implements the Government Policy Statement on Land Transport 2018/2019-2027/2028[2] and the enduring Transport Outcomes: *A framework for shaping our transport system: Enabling New Zealanders to flourish Transport outcomes and mode neutrality, Ministry of Transport*, June 2018.

Achieving these outcomes this will assist regulatory authorities achieving Part 2 of the RMA by providing for the use of natural and physical resources in a way which enables people and communities to provide for their health and safety[3] and the maintenance and enhancement of amenity[4].

There are various regulatory methods (within and outside of the RMA) to achieve this outcome. A district plan based method has been assessed as the most implementable method in the current environment. This assessment considers a range of district plan methods as required under section 32 of the RMA.

The assessment concludes that an integrated suite of district plan provisions is the most effective and efficient method to provide reasonable levels of amenity and health protection for sensitive activities. The recommended provisions are based on a (modelled) noise contour line being established with activities 'inside' the contour being subject to specific requirements to provide improved health and amenity outcomes.

The recommended provisions relate to new or altered (increased) sensitive activities located within the modelled noise contour and the usual operation of the transport network, they do not:

a. apply retrospectively to existing buildings or sensitive activities;
b. require land owner to address effects resulting from transport network defects (eg potholes), which are the responsibility of the road controlling authority; or
c. manage amenity effects from transport noise from new or altered roads where these fall within the ambit of NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

[1] https://www.nzta.govt.nz/assets/About-us/docs/sustainability-action-plan-april-2020.pdf
[2] See paragraphs 123-124 and Table 1 Action 25 – Environment.
[3] Section 5(2), RMA.
[4] Section 7(c), RMA.

1. Introduction

The report has been prepared by Waka Kotahi NZ Transport Agency in accordance with Section 32 of the Resource Management Act 1991 (RMA) to assess the inclusion of human health and amenity provisions within District Plans.

Managing health effects from road noise is a shared responsibility between the road controlling authority and adjacent land users. Territorial authorities also have an important role to play in ensuring that planning instruments appropriately acknowledge and address the issue. Waka Kotahi invests significantly in design, construction and ongoing maintenance to minimise the effects of road noise. It is appropriate that those establishing or modifying land uses adjacent to existing State highways also share responsibility for protecting the health of occupants.

Retrospective management of transport noise effects is generally more difficult and expensive to achieve once activities have established adjacent to transport corridors. Management options are also more limited once activities are in place. For example, some design responses (eg. locating outdoor living areas away from noise sources) are not easily implemented or are precluded, retrospective building improvements can be challenging to implement, costly and disruptive, and property constraints may also limit response options (eg. no land available for acoustic barriers or bunding).

This report evaluates opportunities to provide plan provisions in accordance with section 32 of the RMA (s32). Under the RMA, a section 32 evaluation must:

a. Examine whether the proposed objectives are the most appropriate way to achieve the purpose of the RMA (s32(1)(a));

b. Examine whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their efficiency and effectiveness and summarising the reasons for deciding on provisions (s32(1)(b));

c. Relative to considering the efficiency and effectiveness of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions (s32(2)); and

d. Contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from implementing the proposal (s32(1)(c)).

e. For plan changes, evaluate the proposal against both the objectives of the proposed plan change and the objectives of the existing plan (s32(3)).

Each of these matters is addressed by examining the key issues pertaining to the human health and amenity, and how a range of responses could operate in order to achieve the desired outcomes. This report is supplemented by an 'issue identification' statement (Section 2) which describes the human health effects at issue and assesses the cost of implementing mitigation.

In addition to RMA Part 2 outcomes (including of providing for communities health[5]), Waka Kotahi seeks a gradual reduction in exposure as existing activities are altered or relocated. This outcome aligns with *Toitū Te Taiao – Our Sustainability Action Plan*[6] which in turn implements the Government Policy Statement on Land Transport 2018/2019-2027/2028[7] and the enduring Transport Outcomes: *A framework for shaping our transport system: Enabling New Zealanders to flourish Transport outcomes and mode neutrality, Ministry of Transport*, June 2018.

[5] Resource Management Act, Part 2, Section 5(1).
[6] https://www.nzta.govt.nz/assets/About-us/docs/sustainability-action-plan-april-2020.pdf
[7] See paragraphs 123-124 and Table 1 Action 25 – Environment.

2. Issue identification

It is widely accepted nationally and internationally that noise from transport networks have the potential to cause adverse health and amenity effects on people living nearby. That potential has been documented by authoritative bodies such as the World Health Organisation (WHO)[8] including the publication *Environmental noise guidelines for the European region* in October 2018 (WHO Europe Guidelines).[9] The WHO Europe Guidelines are based on a critical review of academic literature and followed a rigorous protocol to assess the evidence of adverse effects.

With respect to sound from transport networks, the WHO Europe Guidelines note the potential for the following adverse effects:

i. sleep disturbance;
ii. high annoyance;
iii. hypertension; and
iv. ischaemic heart disease.

Based on the strength of the evidence of adverse effects, WHO recommends that policymakers reduce sound exposure from transport networks to below a range of guideline values.

State highways[10] pass through both urban and rural areas and most have sufficient traffic volumes to generate sound above WHO Europe Guideline levels, indicating there will be impacts on human health and amenity where noise-sensitive activities locate nearby.

In New Zealand, Quality Planning's *Managing Land Transport Noise Under the RMA* 2013 Guidance Note[11] recognises that transport noise has potential health effects and identifies district plan responses (eg. managing sensitive activity location, setbacks, zoning (and re-zoning), and structural restrictions). The Guidance Note provides:

> *One of the environmental results expected with the management of noise in plans should be the protection of people and communities from the impacts of land transport noise exposure*[12].

Within the Guidance Note, five alternative (non-RMA) responses[13] are identified (urban design strategy, bylaws, NZ Standards, Building Code and Waka Kotahi guidance). Two of these (the Building Code and Waka Kotahi guidance) are addressed in this assessment.

[8] World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Night noise guidelines for Europe, 2009; World Health Organisation, Burden of disease from environmental noise, 2011
[9] World Health Organisation, Environmental noise guidelines for the European region, 2018.
[10] May also apply to high traffic volume roads managed by other Road Controlling Authorities.
[11] https://www.qualityplanning.org.nz/node/825
[12] https://www.qualityplanning.org.nz/node/825 *4. Environmental Effects Expected – Optional*, page 12.
[13] https://www.qualityplanning.org.nz/node/825 *Local Approaches – other mechanisms,* page 14.

3. Objectives Assessment

Section 32(1)(a) of the RMA requires an examination of whether a proposed objective is the most appropriate way to achieve the purpose of the RMA. The purpose of the RMA is set out in Part 2, Section 5 of the Act.

> *5 Purpose*
> *(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.*
> *(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*
> *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
> *(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
> *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Waka Kotahi has formulated proposed objectives and policies for inclusion in district plans. An assessment of the proposed objective against RMA section 5 is set out in Table 1, below.

Table 1: Assessment of Objective under Section 5

Proposed Provision	**Reason**
Objective 1 Protect sensitive activities from potential health and amenity effects that may arise from operational state highway noise. Policy 1 Locate and design new and altered buildings containing noise sensitive activities to minimise the potential for adverse effects from the designated state highway network. Policy 2 Manage subdivision which could contain noise sensitive activities through setbacks, physical barriers and design controls to ensure subsequent development can be located, designed and constructed so as to minimise exposure to noise.	Section 2 of this report describes likely adverse effects on sensitive activities where they are located in close proximity to the transport network. The objective (and supporting policies) will enable communities to provide for their social well-being and health by ensuring that noise sensitive activities located in close proximity to a state highway incorporate appropriate protection so as to ensure improved health outcomes and amenity levels.

The balance of Part 2 of the RMA provides the framework for the sustainable management of natural and physical resources. Section 6 lists matters of national importance that shall be recognised and provided for, section 7 lists other matters that all persons exercising functions and powers under the RMA shall have particular regard to and section 8 addresses matters relating to the principles of the Treaty of Waitangi. No relevant matters in sections 6 or 8 have been identified. The proposed objective has been assessed against the following provisions of section 7 in Table 2.

Table 2: Assessment of Objective under Part 2 Section 7	
RMA Provision	**Objective 1**
s7(b) (the efficient use and development of natural and physical resources)	Objective 1 will provide for the efficient use and development of physical resources (land and the State highway network) by enabling the proximity effects of land use and infrastructure to be managed appropriately.
s7(c) (maintain and enhance amenity values)	Objective 1 will give effect to s7(c) by enhancing amenity by reducing effects of noise on noise-sensitive activities.

It is considered that the proposed objective is consistent with Part 2, section 5 of the Act and will result in the sustainable management of natural and physical resources.

4. Provisions Assessment

Sections 32(1)(b) and 32(2) require assessment of the proposed plan provisions to be undertaken. These are summarised as:

a. whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their *efficiency and effectiveness* and summarising the reasons for deciding on provisions; and
b. relative to considering the **efficiency and effectiveness** of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions.

The cost and benefit assessment must identify and assess the costs and benefits associated with environmental, economic, social, and cultural effects including economic growth and employment that are anticipated to be provided or reduced. If practicable, these are to be quantified.

Section 32(2)(b) also requires an assessment of the risk of acting or not acting if there is uncertain or insufficient information. In this case, there is considered to be sufficient information about the subject to determine the range and nature of effects of the options set out, and so that assessment has not been undertaken.

4.1 Noise

4.1.1 Identifying options

Where the reasonably practical alternative options (assessed in Table 3) include plan provisions, they are framed in the following context:

a. The provisions apply to all new and altered (by increase in floor area) *Noise Sensitive Activities* (defined in **Attachment 1**) which, in addition to residential activities, includes activities such as student or retirement accommodation, educational activity (including in any child care facility), healthcare activity and any congregations within places of worship/marae.

b. Internal noise criteria of between 35 dB $L_{Aeq(24h/1h)}$ and 45 dB $L_{Aeq(24h/1h)}$ have been allocated to the *Noise Sensitive Activities* for the reasons described in **Attachment 2**. Specifications detailing how to achieve internal noise space can be either specified as a *Construction Schedule* included as part of **Attachment 1** or by a design certified by an acoustic consultant.

c. Provisions include ventilation requirements where internal noise criteria are to be met; without ventilation the effectiveness of built acoustic treatment is compromised (ie. windows open for ventilation compromise the performance of building envelope noise mitigation measures). Ventilation requirements are specified in **Attachment 1**.

d. Outdoor living space provisions apply only to areas specifically identified by the district plan as required outdoor living areas.

e. Provisions include a mapped extent to which the provision would apply. This is described as Noise Control Boundary Overlay (NCBO) in accordance with the National Planning Standards Mapping Standard or identified as a 'yard'.

f. The provisions:
   (i) do not apply retrospectively to existing sensitive activities;
   (ii) are not proposed to require a land owner to address effects resulting from transport network defects (eg potholes), which are the responsibility of the road controlling authority; and
   (iii) do not manage amenity effects from transport noise from a new or altered road; these generally fall within the ambit of NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

The reasonably practical alternative options identified include (a) to (d) above and are identified as:

a. **Do nothing:** No plan provisions to protect sensitive activities from potential health and amenity effects.

b. **Modelled setback:** Require specific response to manage noise based on a (modelled) noise contour line (NCBO) being established. Activities 'inside' the NCBO are a permitted activity (for the purposes of noise) if specific requirements are met. For the reasons set out in **Attachment 2**, the recommended extent of the NCBO is set at 57 dB $L_{Aeq(24h)}$. **Attachment 4** explains the basis of the acoustic model which takes into account environmental factors such as traffic volume, road surface, topography and buildings.

c. **Metric setback:** Require specific response to manage noise where a sensitive activity is located within a specific NCBO based on distance (eg 40m, 80m or 100m) from a state highway. The specific setback distance may be based on speed limit (eg 40m for <70k/hr or 80m or 100m >70k/hr). Activities 'inside' the NCBO are a permitted activity if specific requirements are met.

d. **Yard:** A 'no build' setback from state highways. All noise sensitive activities in the yard area are listed non-complying activities. Yard setback could be set based on road speed limit (eg 40m for <70k/hr or 80m or 100m >70k/hr).

An assessment of the *efficiency and effectiveness* of the options assessed in terms of Sections 32(1)(b) and 32(2) is included in Table 3.

Table 3: Alternative Option Assessment

Option	Effectiveness and Efficiency	Costs	Benefits
Option A: Do Nothing	Highly efficient but not effective. This option requires no action from the regulatory authority or applicants so is efficient. It is considered to be the least effective as it will allow an increase in adverse human	An increase in adverse health and amenity impacts (including costs). Poorer health and amenity outcomes fall on wider community and can be difficult to identify or resolve at an individual level.	No additional regulatory cost or costs to land owners in terms of compliance or building cost increases.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
	health and amenity effects over time.		
Option B: Modelled Setback	Highly efficient and effective. Utilising a model based on existing environmental conditions to calculate expected noise levels provides a more effective and efficient approach to setting the extent that a noise control should apply compared with Options C and D (both of which are 'standard width' controls regardless of local conditions).	A range of compliance and construction costs will apply when compared with Option A. These range from building and compliance design costs to meet permitted activity standards through to resource consent costs should standards not be complied with. The costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant. Costs of mitigation have been independently assessed by Acoustic Engineering Services Limited[14] and indicate typically a 0% to 2% increase in construction cost for new dwellings and additions[15] in new materials. Waka Kotahi will also bear the cost of maintaining up to date modelling data to support noise contour line establishment.	Better human health outcomes as there will be less exposure to the causes of negative health and amenity outcomes when compared with Option A. Option B provides a comprehensive regulatory approach which recognises the spatial extent of road traffic noise based on environmental factors (eg traffic volume, topography, road surface, existing building locations). This will result in a more accurate reflection of the extent of likely effects than Options C or D. The provisions do not aim to achieve 'zero' health effects (which is the outcome sought by the WHO Guidelines). Rather, the Modelled Setback/Option B provisions provide for a balance between health and amenity protection, cost and regulatory administration.

[14] **Attachment 3**: Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.
[15] **Attachment 3:** Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
Option C: Metric Setback	Moderately efficient and effective. Option provides a reasonable outcome but will 'capture' more sites than is necessary to be highly efficient.	Option C (especially where applied at 80m to 100m) is likely to affect a greater number of sites than Option B. It is a 'blanket' approach which does not reflect individual area conditions. Other costs are the same as for Option B.	Better human health outcomes as there will be reduced exposure to the causes of negative health and amenity outcomes when compared with Option A. Less costly to prepare (set distance rather than modelled) when compared with Option B.
Option D: Yard provision	Highly effective but not efficient. The 'no build' yard will provide a high level of health and amenity protection but does not result in an efficient use of land.	Limits construction on particular areas of a site; high cost borne by land owners as sensitive activity development is limited in these areas.	Good human health outcomes as there will be a reduced number of sensitive activities exposed to the causes of negative health and amenity outcomes.

4.1.2 Assessing reasonably practicable options

Based on the cost benefit analysis presented in Table 3, Table 4 summarises reasonably practicable options.

Table 4: Identifying Reasonably Practicable Options	
Option	Is it reasonably practicable?
Option A: Do nothing This option is currently applied in some District Plans.	✓
Option B: Modelled Setback Options similar to this are currently applied in some District Plans.	✓
Option C: Metric Setback Options similar to this are currently applied in some District Plans.	✓
Option D: Yard requirement Options similar to this are currently applied in some District Plans.	✓

4.1.3 Preferred option

Based on the analysis in Table 3 and the reasonably practicable options identified in Table 4, Table 5 rates each of the reasonably practicable options.

Least Preferred			Most Preferred
Option A: Do Nothing.	**Option D:** Yard setback	**Option C:**. Metric Setback	**Option B:** Modelled Setback

For the reasons set out in Tables 3 and 4, the Modelled Setback/Option B is considered to be the most efficient and effective method for addressing the health and amenity effects of transport noise. In accordance with National Planning Standards[16], should they be adopted, the provisions must be located in the district or city wide Noise chapter of the district / unitary plan.

5. Conclusion

The Modelled Setback/Option B is identified as the preferred approach to manage the potential health and amenity effects of transport network operations, and to and provide a reasonable and appropriate balance between cost and benefit. The provisions apply only where an existing noise-sensitive activity is extended or a new noise-sensitive activity is proposed adjacent to a designated transport corridor.

The Modelled Setback/Option B have been detailed and compared against a number of alternatives in terms of their costs, benefits, and efficiency and effectiveness in accordance with the relevant clauses of section 32 of the RMA.

The Modelled Setback/Option B are considered to represent the most appropriate means of achieving the proposed objective and of addressing the underlying resource management issues relating to the transport environment, human health and amenity.

New or altered State highway transport projects will continue to be assessed under NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

[16] The District-wide Matters National Planning Standard requires at 33 that: *If provisions for managing noise are addressed, they must be located in the Noise chapter. These provisions may include: … c.sound insulation requirements for sensitive activities and limits to the location of those activities relative to noise generating activities.*

Attachment 1: Provisions (Option B)

Objective 1

Protect sensitive activities from potential adverse health and amenity effects that may arise from designated state highway noise.

Policy 1

Locate and design new and altered buildings containing noise sensitive activities to minimise the potential for adverse effects from the designated state highway network.

Policy 2

Manage subdivision which could contain noise sensitive activities through setbacks, physical barriers and design controls to ensure subsequent development can be located, designed and constructed so as to minimise exposure to noise.

New Definition

Noise Sensitive Activity(s): Means any residential activity including visitor, student or retirement accommodation, educational activity including in any child care facility, healthcare activity and any congregations within places of worship/marae. Excludes those rooms used solely for the purposes of an entrance, passageway, toilet, bathroom, laundry, garage or storeroom.

1. Permitted Activity Rule Indoor Noise

a. Within the Noise Corridor Boundary Overlay, where:
   (i) a new building that contains a noise sensitive activity; or
   (ii) an alteration to an existing building resulting in an increase in floor area of a noise sensitive activity; or
   (iii) a new noise sensitive activity is located in an existing building;

   is proposed, it is to be:

   (iv) Designed, constructed and maintained to achieve indoor design noise levels not exceeding the maximum values in Table 1; and
   (v) If windows must be closed to achieve the design noise levels in (1)(a)(i), the building is designed, constructed and maintained with a mechanical ventilation system that:
      a. For habitable rooms for a residential activity, achieves the following requirements:
         i. Provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and
         ii. is adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour; and
         iii. provides relief for equivalent volumes of spill air; and
         iv. provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18^0C and 25^0C; and
         v. does not generate more than 35 dB $L_{Aeq(30s)}$ when measured 1 metre away from any grille or diffuser.

b. For other spaces, is as determined by a suitably qualified and experienced person.

c. A report is submitted by a suitably qualified and experienced person to the council demonstrating compliance with clauses (1)(a)(i) and (ii) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise.

Table 1

Occupancy/activity	**Maximum road noise level** [Note 1] $L_{Aeq(24h)}$
Building type: Residential	
Sleeping spaces	40 dB
All other habitable rooms	40 dB
Building type: Education	
Lecture rooms/theatres, music studios, assembly halls	35 dB
Teaching areas, conference rooms, drama studios, sleeping areas	40 dB
Libraries	45 dB
Building type: Health	
Overnight medical care, wards	40 dB
Clinics, consulting rooms, theatres, nurses' stations	45 dB
Building type: Cultural	
Places of worship, marae	35 B

Note 1: The design road noise is to be based on measured or predicted external noise levels plus 3 dB.

2. Permitted Activity Rule Outdoor Living Area

a. Where an outdoor living or outdoor activity space required by another rule in the Plan is within the Noise Corridor Boundary Overlay and the outdoor space is required for a noise sensitive activity, the required outdoor living space is to be designed and maintained to achieve noise levels not exceeding the maximum values in Table 2; and

b. A report is submitted by a suitably qualified and experienced person to the council demonstrating compliance with clauses (2)(a) above prior to the construction or alteration of the any building to which the outdoor living space relates.

Table 2

Activity	Maximum road noise level [Note 1] $L_{Aeq(24h)}$
Required Outdoor Living Space	57 dB

Note 1: The design road noise is to be based on measured or predicted external noise levels plus 3 dB.

3. Restricted Discretionary Activity Rule

Any new or altered noise sensitive activity which does not comply with Permitted Activity (1) or (2).

Restricted Discretionary Activity – Matters of Discretion

Discretion is restricted to:
(a) Location of the building and outdoor living space;
(b) The effects of the non-compliance on the health and amenity of occupants; and
(c) The outcome of any consultation with Waka Kotahi NZ Transport Agency.

Restricted Discretionary Activity – Assessment Criteria

Discretion is restricted to:
(a) Whether the location of the building minimises effects;
(b) Alternative mitigation which manages the effects of the non-compliance on the health and amenity of occupants; and
(c) The outcome of any consultation with Waka Kotahi NZ Transport Agency.

Attachment 2: Technical Basis of Noise Criterion

In preparing the Modelled Setback/Option B, Waka Kotahi has assessed existing research, standards and guidelines to guide selection of appropriate noise criteria.

Two documents are identified as providing national and international guidance and directives for transport noise: the WHO Europe Guidelines and NZS 6806:2010 *Acoustics – Road-traffic noise – New and altered roads* (NZS 6806).

In addition, AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS/NZS 2107) is a joint Australia and New Zealand standard which provides compliance measurement methods for background noise and recommends design criteria for occupied spaces.

WHO Europe Guideline

The WHO Europe Guidelines (the Guideline) contains key recommendations in regards to transport noise including:

Road[17]:

- For average noise exposure: recommends reducing noise levels produced by road traffic below 53 dB L_{den}; and
- For night time exposure: recommends reducing noise levels produced by road traffic during night time below 45 dB L_{night}.

The WHO Europe document contains guidelines; it does not set a fixed standard. The Guideline has been prepared as an international research document and its outcomes need to be considered within the New Zealand statutory context before reference or inclusion in planning or policy documents. WHO guidance regarding effects of noise on health (more generally) are reflected in NZS 6806[18].

NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads

NZS 6806 is the principal national document for management of noise in relation to new and altered roads. The purpose of NZS 6806 is to ensure noise effects on existing sensitive activities (described as Protected Premises and Facilities / PPFs) from new or altered roads are managed. It has been developed with the intention of being suitable to support RMA processes and to set *reasonable noise criteria* for road traffic noise (from new or altered roads) taking into account, among other things, health effects[19].

NZS 6806 is a national standard, has been specifically developed for inclusion within an RMA framework, has been adopted into district plans and utilised in designations for the specific purpose of transport noise management. It is accepted as current good practice in regards to setting requirements which result in *reasonable* noise outcomes.

[17] World Health Organisation, Environmental noise guidelines for the European region, 2018. Section 3.1.
[18] NZS 6806 :2010 Section 4.7.1.
[19] NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, section 1.1.4.

NZS 6806 includes an external ("Category A") noise criterion[20] for altered roads (64 dB $L_{Aeq\ (24h)}$), and two criteria for new roads depending on design year traffic volumes (64 dB $L_{Aeq\ (24h)}$ for higher volume roads and 57 dB $L_{Aeq\ (24h)}$ for lower volume roads).

Higher volume roads are those which, at design year, are predicted to carry greater than 75,000 AADT (Average Annual Daily Traffic). Lower volume roads are those which, at design year, are predicted to carry between 2,000 and 75,000 AADT.

Internal noise criterion[21] for habitable spaces are set at 40 dB $L_{Aeq\ (24h)}$ for altered and new roads (regardless of AADT).

Analysis of 2018 AADT data[22] shows the majority of existing state highways carry less than 75,000 AADT. It also indicates that only central parts of the Auckland motorway network currently have an AADT greater than 75,000.

While NZS 6806 applies to new and altered roads (ie. the onus is on the road controlling authority to manage effects), it provides strong guidance as to *reasonable* levels and expectations of noise levels in these environs. If these (<75,000 AADT) state highways were constructed (new) or altered in the current statutory environment, the lower level (57 dB $L_{Aeq(24h)}$) of the NZS 6806 external noise limits would be applied.

For road-traffic noise averaged over 24 hours, the internal 40 dB $L_{Aeq(24h)}$ criterion in residential habitable spaces from NZS 6806 represents a reasonable level as at night the level should reduce (as traffic volumes reduce) so as to avoid undue sleep disturbance.

AS/NZS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors

The scope of AS/NZS 2107 is to recommend criteria for healthy, comfortable and productive environments and it applies to steady-state or quasi-steady-state sounds. The Standard is ambiguous whether it should apply to transportation noise; regardless it provides an indication of reasonable internal levels for different types of sensitive activities. The criteria adopted in the Modelled Setback/Option B are generally consistent with AS/NZS 2107.

Conclusion

For the Modelled Setback/Option B, Waka Kotahi selected the NZS 6806 external level of 57 dB $L_{Aeq(24h)}$ and internal levels of between 35 dB $L_{Aeq(24h/1h)}$ and 45 dB $L_{Aeq(24h/1h)}$. This is because:

a. the majority of state highway AADT fall within the lower AADT band for external noise within NZS 6806 (which requires external noise levels of 57 dB $L_{Aeq(24h)}$ for a new or altered road); and

[20] NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, Table 2 – Noise Criteria, A (primary free-field external noise criterion).
[21] NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, Table 2 – Noise Criteria, C (internal noise criterion).
[22] https://www.nzta.govt.nz/resources/state-highway-traffic-volumes/ 2018 data - *State highway volumes by region (in Excel format)*

b. the outdoor noise exposure level of 57 dB and an indoor noise threshold near the top of the design range[23] in AS/NZS 2107:2016 (40 dB) have been selected as these levels are considered to provide a reasonable level of health and amenity protection but are not the most stringent.

[23] *top of the design range* means that the noise limit is at the upper level of range - ie. allows more noise rather than less.

Attachment 3: Building Cost Assessment

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Memorandum

To:	Greg Haldane, Waka Kotahi
From:	Clare Dykes, Acoustic Engineering Services
File Reference:	AC20063 – 01 – R2
Date:	Friday, 12 June 2020
Project:	Cost of traffic noise mitigation measures
Pages:	6

Meeting ☐ Telephone ☐ Memorandum ☑ File Note ☐

Dear Greg,

In March 2020, Waka Kotahi NZ Transport Agency engaged Acoustic Engineering Services (AES) and O'Brien Quantity Surveying to undertake a study relating to the cost of traffic noise insulation measures. The project involved a review of a number of situations where traffic noise mitigation had been installed, including:

- Buildings which required upgrades to reduce traffic noise break-in as a result of their location in proximity to major roads, and;
- New residential neighbourhoods which were constructed near to major roads, where traffic noise barriers were integrated into the overall scheme design so that the upgrading of dwellings was no longer required (or was reduced) and noise in outdoor living areas was reduced.

This memorandum summarises the study, and the general trends visible in the results.

1.0 BUILDING UPGRADES

A common method of ensuring that noise from roads is not intrusive within buildings is to design the building envelope to provide a high level of sound insulation, and to provide a mechanical ventilation system so occupants do not need to open windows for cooling and fresh air.

The Christchurch District Plan contains a rule requiring the design of new noise sensitive buildings to be constructed in higher noise locations to include these sound insulation features. AES have previously completed a study related to the Christchurch District Plan sound insulation rule, which involved a review of the specific circumstances relating to a sample of building projects. The work described in this memo built on aspects of that previous study, and looked to quantify the cost of those building upgrades, to assist Waka Kotahi in understanding the potential financial implications of mandatory traffic noise insulation rules. A number of additional examples from various sources were added to the original sample, to increase the sample size and diversity.

We have also completed a review of the Proposed and Operative District Plans for the 67 New Zealand Districts. Two thirds of the District Plans throughout the country include requirements for sound insulation when dwellings are located in proximity to major roads. Of these, 10 % include a requirement which is very

similar to the Waka Kotahi Guidelines[1] centred around an internal noise level requirement of 40 dB $L_{Aeq\ (24\ hour)}$ in bedrooms and other habitable spaces, and the provision of mechanical ventilation. The remaining rules vary, with common variations including requiring different internal noise levels to be met, omitting any mechanical ventilation requirement (or a reduced mechanical ventilation requirement), and specifying a fixed level of sound insulation performance to be achieved by the building façade. As discussed below, all of these rule variations have a different cost impact.

1.1 The sample

A total of 58 buildings were considered for inclusion in the analysis. However, detailed costings were only completed on 23 of these, primarily because:

- A number of the building projects successfully obtained a Resource Consent to legitimise a partial or complete non-compliance with the relevant sound insulation rule, and so these results would not have assisted with understanding the cost of compliance.
- For a number of the building projects there was not sufficient publicly available information to complete an accurate costing.

The final 23 building projects included 11 detached residential dwellings, seven multi-residential units (such as terraced houses and duplexes), and five apartment buildings. These buildings were expected to experience worst-case traffic noise levels ranging from 55 dB $L_{Aeq\ (24\ hours)}$ to 71 dB $L_{Aeq\ (24\ hours)}$.

As discussed above, a variety of sound insulation rules are encountered throughout the country. The building projects in the sample had been assessed against the following rules:

- 12 of the sample has been assessed against a requirement which is similar to that described in the Waka Kotahi Guidelines, including an internal noise level requirement of 40 dB $L_{Aeq\ (24\ hour)}$ in bedrooms and other habitable spaces, and the provision of mechanical ventilation.
- Two of the sample were assessed using a rule which has a different internal noise level requirement with no mechanical ventilation required.
- Eight of the sample were assessed against rule with a façade reduction requirement or a provided set of constructions intended to provide a fixed façade reduction, and no mechanical ventilation required.
- One involved review against an internal noise level requirement of 40 dB $L_{Aeq\ (24\ hours)}$ for some spaces, and a façade reduction requirement for others.

Overall, the sample was relatively small – however a moderate number of examples could be assessed against a rule similar to that preferred by Waka Kotahi. Otherwise the variety within the sample is typical of the variety in sound insulation rules encountered in New Zealand.

Challenges of extending the sample included the lack of a centralised database to use for establishing a list of building projects of potential interest, and then the lack of availability of publicly available information for projects which provides sufficient detail for accurate costings.

1.2 Assumptions

Key assumptions embodied in this part of the study are as follows:

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[1] Waka Kotahi NZ Transport Agency, *Guide to the management of effects on noise sensitive land use near to the state highway network*, Version 1.0, September 2015

- The reported external noise levels are based on the available traffic numbers, road surface, and speed information for the road adjacent to the building project site at the time, and are for the most exposed building façade.
- The upgrades that were recommended by the acoustic engineers involved in each case were installed and alternative systems were not used.
- The systems where not specified were originally 10 mm Standard Gib plasterboard internal linings for walls, and 13 mm Standard Gib plasterboard linings for ceilings, and 4 mm float glass / 12 mm air space / 4 mm float glass for glazing.
- Where 7 mm Ecoply RAB board was specified for external walls it was assumed that this would have been included regardless of the acoustic upgrades, and so was not included in the upgrade costing.
- Where not specified, the mechanical ventilation system was assumed to be of similar or equal design and performance to those projects where this detail was provided.

1.3 Findings

We have summarised a number of key observations from the analysis below.

Table 1.1 outlines the increase in overall building cost associated with any upgrades to the building façade and/or the installation of mechanical ventilation system, to ensure compliance with the various sound insultation rules.

Table 1.1 – Summary of cost of traffic noise mitigation by building type

Building Type	Range of external noise levels (dB $L_{Aeq\ (24\ hours)}$)	Increase in overall cost of building (per residential unit)	Percentage increase in overall cost of building
Detached residential	55 – 68	$0 – $16,000	0 – 2 %
Residential units	58 – 69	$500 – $15,000	0 – 2 %
Apartment buildings	60 – 71	$500 – $16,000	0 – 1 %

These results illustrate that the overall percentage increase in building cost due to compliance with a sound insulation rule was 2 % or less (noting that none of the buildings in the sample were exposed to external traffic noise levels exceeding 71 dB $L_{Aeq(24\ hour)}$).

For the residential units and apartment buildings, the figures in table 1.1 are based on the total cost of upgrades, divided by the total number of residential units in the development. However, some units did not require any upgrades, as they experience lower external noise levels. If the total cost of upgrades is only divided by the number of units in the development which required upgrading, the percentage increase changes to 1 – 4 %.

In table 1.2 the results are presented based on the type of sound insulation rule that the assessment was undertaken against.

Table 1.2 – Summary of cost of traffic noise mitigation by rule type

Rule	Range of external noise levels (dB $L_{Aeq\ (24\ hours)}$)	Increase in overall cost of building per residential unit	Percentage increase in overall cost of building
Internal noise level of 40 dB $L_{Aeq\ (24\ hours)}$ and mechanical ventilation	55 – 71	$0 – $16,000	0 – 2 %
Alternative internal noise level requirement, no mechanical ventilation	64 – 65	$500 – $1,500	0 – 1 %
Façade reduction requirement or defined constructions, and no mechanical ventilation	55 – 69	$0 - $16,000	0 – 2 %

This summary appears to indicate that the costs associated with both the internal noise level and façade reduction rules are similar (noting that the sample size for the 'alternative internal noise level requirement, no mechanical ventilation' rule was very small, and the external levels were moderate). However, we note the following:

- For the methods which used internal noise levels, the increase in costs is very dependent on the external noise level. The developments which resulted in upgrade costs of less than 1 % typically experienced external noise levels below 65 dB $L_{Aeq\ (24\ hours)}$. There are exceptions to this depending on the layout of the units.
- While the 'façade reduction requirement or defined constructions' rules appear to attract a similar cost to the 'internal noise level' rules, those particular rules did not require mechanical ventilation to be installed. Occupants in some situations would therefore have still had to choose between thermal comfort, and noise. Additional cost should have been involved with installing mechanical ventilation in those situations, as was the case for the 'internal noise level of 40 dB $L_{Aeq\ (24\ hours)}$ and mechanical ventilation' examples. To put it another way, the cost may be been similar, but the benefit is likely to have been less in many cases.
- The required construction upgrades (and therefore the costs) of the 'façade reduction requirement or a defined set constructions' rules are not dependent on external noise levels. This means that while the range of cost increases is similar, in some situations the high costs lead to no benefit, as the external noise levels were low. For the 'internal noise level of 40 dB $L_{Aeq\ (24\ hours)}$ and mechanical ventilation' examples where the costs were high, that was at least in response to high external noise levels and so was justified.

For a small number of developments, no upgrades were required as either external traffic noise levels were very low, or the original design included high mass cladding with small window areas on key facades.

2.0 BARRIERS

An alternative method for reducing the levels of road traffic noise experienced by the occupants of new dwellings is for a barrier to be installed to screen a new residential neighbourhood from the road. This means that individual dwellings are less likely to need to be upgraded, and noise levels in outdoor living areas are also reduced. However, the developer of the new neighbourhood is likely to primarily bear the cost of the barrier, compared to the building upgrades discussed in section 1.0 above, which are paid for by the individual building owners.

2.1 The sample

10 new residential neighbourhoods were included in the analysis. All of these adjoined State Highways and were likely to have been designed with some regard to the Waka Kotahi Guidelines. Each of the neighbourhoods had been screened from the State Highway with a traffic noise barrier, including:

- Seven examples with 'acoustic' fences ranging in height from 2 – 3 metres
- Two examples where earth bunds had been constructed – these were 2 – 3 metres in height, and 8 – 9 metres wide
- One example with a combination of acoustic fencing and earth bund

For each example, we determined the number of dwellings which would have experienced traffic noise levels of greater than 57 dB $L_{Aeq\ (24\ hours)}$ without a barrier. These dwellings would have been the most likely to have required upgrading had the barrier not been constructed, in order to satisfy a traffic noise insulation rule of the type discussed in section 1.0 above. We note that it is possible that some dwellings still required upgrading even with the barrier – for example the upper level of two-storey houses. As above, the barrier also reduces the noise levels in outdoor living areas associated with dwellings – which is a benefit compared to the sound insulation rules discussed in section 1.0, which only modifies the environment within a dwelling.

The number of dwellings which would have experienced traffic noise levels of greater than 57 dB $L_{Aeq\ (24\ hours)}$ without a barrier ranged from 1 through to 120. The number of affected lots was dependent on the overall layout of the subdivision relative to the road, as well as the traffic numbers, road surface, and speed.

2.2 Assumptions

Key assumptions were as follows:

- The acoustic fences were constructed of 125 x 75 mm H4 posts, 75 x 50 mm H3 railings, 150 x 25 mm H3 palings with 50 x 25 mm H3 battens over joins and 150 x 50 mm H3 capping.
- In some cases, the effective height of fences was increased, because they were constructed on top of a retaining wall. It was assumed that the retaining walls would have been required for general site levelling and not specifically to enhance the acoustic effectiveness of the barrier. This was therefore not included within the upgrade cost.
- It was assumed that the subdivision layout without the barrier would have been exactly the same. In reality larger setback distances or other rearrangement of the layout may have been included if the traffic noise had not been largely mitigated by the barrier.
- The earth bund was assumed to be constructed with surplus excavated soil from the site, with a layer of imported topsoil 150 mm thick spread on top for grass.

2.3 Findings

We have summarised a number of key observations from the analysis below.

Table 2.1 shows the cost of each barrier, divided by the number of dwellings which would have experienced a noise level of greater than 57 dB $L_{Aeq\ (24\ hours)}$ without a barrier. We have grouped the results together for different barrier types, and have also shown the situations where are large and small number of dwellings benefited from the barrier separately.

Table 2.1 – Summary of cost of traffic noise mitigation by barrier type

Barrier Type	Approximate number of dwellings which benefited from barrier	Cost of barrier per dwelling
Acoustic fence	1 – 10	$15,000 – $30,000
	30	$10,000
	80 – 110	$3,000 - $5,000
Earth bund	10	$60,000
	50	$6,000
Combination	120	$4,000

Overall, this analysis shows that when the number of affected dwellings is low (i.e. the layout results in few lots near the road, or the volume of traffic is low etc.) the overall cost per dwelling is high. When these absolute costs are viewed as a percentage of the likely final value of each of the affected sections, the range is from 2 % (acoustic fence, benefiting a large number of sections) to 30 % (earth bund, benefiting a few sections). As above, in all of these examples for dwellings constructed on these sections, additional costs in the order of those presented in tables 1.1 and 1.2 above would be largely avoided, and traffic noise levels in outdoor living areas would also be reduced.

We note that a key decision in the above analysis is whether the loss of the land under the footprint of any earth bund is included as a 'cost'. In all of the examples the bund fell within an area which was ultimately sold to a homeowner as part of a site, or was within an area close to the State Highway which was unlikely to have been developed for residential use regardless – so the loss of the land under the bund has not been included as a cost. As an example, for the development with approximately 50 affected dwellings, if the cost of the land under the bund was included in the analysis, the total cost as a percentage of the likely final value of each of the affected sections would increase from 3 % to 16 %.

We trust this is of assistance. If you have any queries, please do not hesitate to contact us.

Kind Regards

Clare Dykes

Clare Dykes
MBSc, MASNZ
Senior Acoustic Engineer
Acoustic Engineering Services Ltd

Attachment 4: Technical Basis of Model and Data Smoothing

[Refer separate attachments]

Attachment 5: Other Options Considered

For completeness, Waka Kotahi has also considered methods outside of the district plan to manage the issue; these include both regulatory (Building Code; National Environmental Standard) and private covenants ("no complaints" covenants) and built responses:

Regulatory

The **Building Act** (and Code) currently provides specifications to manage inter-tenancy noise (eg noise between residential apartments within the same building with shared tenancy walls). It does not, however, provide requirements for management of noise generated from outside a building (eg transport noise or nightclub noise from a separate building). A change to the Building Code would be needed to address the issue. While proposals for relevant changes to Clause G6 of the Building Code were circulated in 2016 and remain on MBIE's work programme, these are not imminent.

A **National Environmental Standard** (NES) would require promulgation by central government, there is no current plan to promulgate RMA-based national planning direction in relation to health and amenity effects relative to transport.

There are situations where **covenants** are entered into where parties acknowledge and accept particular types of effects in return for locating in an area; commonly referred to as "no complaints" covenants. There are a number of limitations with this approach:

a. it does not remove the actual effects on health and amenity therefore does not address the matters within Part 2 of the RMA;
b. it is reliant on both parties coming to agreement;
c. application of a covenant requires a 'trigger' to commence negotiations (eg. a request from a resource consent applicant to undertake works).

The primary limitation is however that it does not address actual health and amenity impacts.

Changes to the Building Act or promulgation of a NES are not directly within the control of Waka Kotahi; covenants require a 'trigger', agreement between parties and do not actually address the effects generated. None of these options are preferred.

Built Response

Waka Kotahi has undertaken a preliminary assessment of noise improvements across its network. It estimates a cost of at least $150M[24] to retrospectively manage noise exposure for approximately 50% of persons exposed to noise above 64 dB $L_{Aeq(24h)}$.

Responses could include retrofitting acoustic barriers and/or installing low noise road surfaces.

Retrofitting noise barriers by motorways by Waka Kotahi has been found to cost in the range of $4,000 to $10,000 per linear metre of barrier. Construction of noise fences by individuals or land developers generally have lower costs.

Retrofitting acoustic barriers has a number of limitations:

- available land and/or ground conditions;

[24] Not currently funded.

- potential visual dominance and shading;
- ongoing maintenance costs (eg graffiti, landscape maintenance); and
- may not be effective for buildings of more than one storey.

There are also some benefits:

- for barriers close to buildings (or close to the road) and comprehensively blocking the line-of-sight of sensitive land uses to the state highway carriageway, a reduction of 5-10 dB can be achieved;
- where applied to large land areas, cost of protecting multiple sites will aggregate to be less than cost of protecting a low number of sites;
- reduces the need for individuals building houses to have to consider road noise or to keep windows closed;
- can provide visual screening giving a benefit in reducing both perception of noise and actual noise level; and
- can provide improved amenity for outdoor areas.

A porous asphalt surface (low noise road surface) would be in the order of \$30+/m^2 (standard two coat chipseal surface would be in the order of \$6/m^2 to \$10/m^2). It cannot generally be laid directly on existing roads, because low noise (asphaltic) road surfaces require stiff underlying pavements, otherwise they fail prematurely. For much of the existing network, laying new asphaltic surfaces therefore first requires rebuilding of the structural pavement, which would increase the cost to over \$100/m^2. Low noise road surfaces can provide in the order of 5 dB reduction in noise generated from the tyre/road interface (although will not materially alter other sounds such as truck engine/air-braking noise). For traffic at highway speeds this is a meaningful improvement, although is often not sufficient to reduce sound to below guideline values.

Overall, while both built options provide some benefits, both options have significant costs and result in the full cost being borne by the road controlling authority in situations where the noise sensitive activity establishes after the state highway.

APPENDIX 6

CLAUSE 23 REQUEST FOR INFORMATION AND RESPONSES

Highbrook Precinct Private Plan Change Request: Response to further information request under clause 23 of Schedule 1 of the RMA

Date	12 December 2022
To	Celia Davison, Manager Planning – Central South Tania Richmond, Consultant Planner to Auckland Council
By email	Celia.Davison@aucklandcouncil.govt.nz Tania@richmondplanning.co.nz
From	Sukhi Singh, Technical Director Planning

Dear Celia and Tanya,

On behalf of Highbrook Living Limited, please find below our responses to the further information requested from Auckland Council (pursuant to Clause 23 of the RMA) for the processing of the private plan change request at 8 Sparky Road, Ōtara. For ease of reference, the responses provided correspond with the numbering of the questions set out in the further information request.

This response includes the following attachments:

- **Attachment 1**: Geotechnical Test Pit Data
- **Attachment 2**: Walking Isochrone
- **Attachment 3**: Cycling Isochrone
- **Attachment 4**: Cultural Values Assessment prepared by Te Ākitai Waiohua
- **Attachment 5**: Highbrook Noise Contour Areas
- **Attachment 6**: Updated Stormwater Management Plan (Technical Report 9)
- **Attachment 7**: Updated Highbrook Precinct Plan

<table>
<tr><th>Category of information</th><th>Council Request</th><th>Applicant's Response</th></tr>
<tr><td colspan="3"><u>Economic matters</u></td></tr>
<tr><td>1. Industrial land occupation 2017-2022</td><td>Please provide an assessment of the amount of land that was identified as being vacant in 2017 but which is now no longer vacant.
The Property Economics Limited document titled "Highbrook Proposed Plan Change Economic Overview", November 2021 ("PEL") uses Auckland Council's "Housing and Business Development Capacity Assessment 2017" ("HBCA") as a base for assessing industrial land demand and supply.
The vacant land supply estimates in the HBCA are now at least five years old, and some of the land that was vacant in 2017 will now no longer be vacant, having been developed in the interim. An updated (2022) estimate of vacant land supply would be a better basis for the industrial land demand-supply assessment than the 2017 data. The PEL report refers to "Building Consent Statistics – Statistics New Zealand" data, which would be useful for this assessment, but has not been used.</td><td>The table below shows the industrial consents in the 3-year period post the Council 2017 HBA. There is no way of determining the proportion of these consents that are occupying vacant land or represent redevelopment / replacement of an old building on an already developed site as this information is not recorded.

<table><tr><th rowspan="2">Year</th><th colspan="3">Auckland Region</th><th colspan="3">Auckland South</th></tr><tr><th>No. of consents</th><th>Value ($m)</th><th>Floor Area (sqm)</th><th>No. of consents</th><th>Value ($m)</th><th>Floor Area (sqm)</th></tr><tr><td>2018</td><td>207</td><td>$606</td><td>415,700</td><td>118</td><td>$424</td><td>301,400</td></tr><tr><td>2019</td><td>228</td><td>$561</td><td>488,600</td><td>120</td><td>$324</td><td>314,200</td></tr><tr><td>2020</td><td>210</td><td>$708</td><td>363,700</td><td>115</td><td>$397</td><td>251,400</td></tr><tr><td>TOTAL</td><td>645</td><td>$1,875</td><td>1,268,000</td><td>354</td><td>$1,144</td><td>867,000</td></tr></table>
The reduction in vacant industrial land can only realistically be quantified by undertaking an audit of all the industrial areas across the region. This is a significant exercise for a single application. Therefore, in terms of assessing the level of vacant industrial zoned land that has been absorbed, the consent data is considered of limited value.

However, Property Economics is aware of a number of large industrial plan changes that have added significant industrial supply (e.g., Whenuapai PC52) and Council Spatial Plans that are promoting significant levels of additional industrial land provision in areas such as Drury, Pukekohe and Silverdale, and the rezoning of industrial land from Heavy to Light in Drury</td></tr>
</table>

Category of information	Council Request	Applicant's Response
		South. As such, the current and proposed provision of industrial zone land in Auckland is likely to be higher than in 2017.
2. Ability to accommodate industrial activity	Please provide an assessment of the range of parcel sizes and building sizes in nearby industrial zones such as Highbrook and East Tamaki, and assessment of the range of activities permitted on the site under the operative Business – Light Industry zoning. ○ The PEL report states that the site is not efficient or practical for light industry activities, however there appear to be many industrial zoned parcels and industrial buildings that are of a size that could be accommodated on the site, including across a wide range of activities that are permitted in the operative Light Industry zone.	The subject site is unique in that it is highly compromised as a development opportunity for industrial activity, so while it may be zoned industrial the land from a practical perspective is unlikely to be developed for industrial development. It is in effect a 'clayton's zone', i.e., land zoned for an activity that practically cannot be developed on the site. The reasons for this are that the thin elongated shape of the site (i.e., residual land left over from the development of Highbrook Drive) and the Council requirement for esplanade reserves along the site's waters edge. These constraints in effect reduce the developable area of the site from around 4ha to only circa 2ha. However, this approx. 2ha is not a uniform development area, but a long thing piece of land bounded by Highbrook Drive on the south side of the site and the esplanade reserve running the length of its north boundary. For industrial development to occur there would need to be an industrial road capable of carrying a high number of truck movements accessed off Highbrook Drive and a turning circle at the end of the internal industrial grade road suitable for trucks. This reduces the developable area even further, to the point any at grade industrial development is highly unlikely to be feasible, i.e., the small amount of site left that could accommodate industrial GFA is so small it is unfeasible. To make any development feasible it would require the use of the vertical space above ground level (industrial

Category of information	Council Request	Applicant's Response
		development has very limited opportunities for multi-storey development), meaning other land uses are required to make land feasible to develop. It is clear there are a high number of practical limitations making industrial development of the site impractical and unfeasible. The counterfactual is likely the land remaining vacant and not utilized at all. The proposal is about trying to find a feasible use for the land so it can be developed. The proposal is not considered to not represent an alternative to industrial development. In that regard in my opinion the proposal does not represent a loss of vacant industrial zone land, but the use of a site that is likely to remain undeveloped if not rezoned for alternate uses.
3. Economic efficiency of industrial land within this location	Please provide a discussion of the economic efficiency of this site being used for industrial activities, as compared to those activities being accommodated instead on alternative locations elsewhere in Auckland. This discussion should also refer to the likely growth in residential capacity in established parts of Auckland as a result of Plan Change 78 Intensification. ○ The PEL report and the Planning Report both note the site's good vehicle accessibility, however the PEL report provides no discussion of the benefits of the site accommodating industrial activity relative to other potential locations. Many	This is partly addressed above with the efficiency relative to an alternative location not being relevant in this instance given the site is unfeasible to develop for industrial activity, and likely to remain so well into the foreseeable future. The primary way to achieve feasible development of the site is to enable vertical development due to the limited at grade developable area available once all the limitations are accounted for. As such the proposal represents one of the most economically efficient uses of the land when considering alternate land uses. It is also worth noting that there is 20ha of industrial land being readied for industrial development directly across Highbrook Drive from the subject site. This puts this site's developable area (i.e., less esplanade reserve and less roading requirements) into perspective.

Category of information	Council Request	Applicant's Response
	of the other places where industrial activities might locate if they were unable to establish on the site are located around the Auckland urban periphery, such as in the structure plan areas identified in the PEL report. ○ Plan Change 78 will significantly increase residential capacity, and therefore probably also population growth, in areas closer to central Auckland, requiring for that population employment opportunities that are easy to access.	The use of the site for vertical residential development and higher density dwellings represents increased efficiency (both land use efficiency and market efficiency) given the likely counterfactual is the site remains vacant as discussed above and its proximate to the Highbrook Business Park and adjacent to the 20ha industrial employment hub across Highbrook Drive in the future. The site is also proximate to the motorway making the site more accessible and efficient than many other sites in the Unitary Plan on the urban fringes of Auckland that are proposed to be rezoned for increased residential density through PC78. It is important to remember, despite the site's high-level access to the motorway and strong locational benefits the site has remained undeveloped and vacant despite other area of Highbrook Business Park being developed over the last 15 years. This provides some real-world facts that the site is not attractive for industrial development and / or is unfeasible to development for industrial activity as discussed above, indicating the site is likely to remain vacant while it maintains its industrial zone.
4. Employment yield of the site	Please provide an assessment of the potential employment yield of the plan change site under the operative Business - Light Industry zone and the proposed Residential – Terraced Housing and Apartment Building zone. This should discuss the relative merits of providing the assessed quantum of employment on the site compared	Based on the commentary above, in my view the industrial employment opportunity on the site is nil as its unlikely to be developed for industrial activity, so its potential employment yield under its zone is considered zero. Under the proposal there is limited potential for employment on the site due to its residential focus. However, employment opportunity is not lost from this area with 20ha of industrial land being developed directly across Highbrook Drive. This means the proposed residential

Category of information	Council Request	Applicant's Response
	to some alternative location, such as one of the structure plan areas identified in the PEL assessment. ○ The number of workers able to be accommodated on the site is a relevant economic impact to consider when evaluating the merits of the proposal.	activity would complement the industrial development and provides the opportunity for living very close to place of employment.
5. Industrial sector definition	Please provide detail on the method used to define the industrial ratios adopted in Appendix 1 of the PEL report, and explain the rationale for the inclusion and exclusion of component activities. ○ The ratios in Appendix 1 are a key input into the PEL report's demand assessment, but they are only described as being based on empirical data. It would assist interpretation of the assessment to understand to what extent the ratios are based on expert opinion. ○ As explained in the economics report, "industrial activities" are those that drive demand for industrial land, but the ratios do not appear to include some activities that are permitted in the Business - Light Industry zone (such as food and beverages and trade suppliers). Nor does it include all of	In terms of employment to land requirement ratios, Property Economics has an extensive base of empirical data by territorial authority based on areas they have assessed reconciling land use ratios by employment type (zoned industrial land provisions against employment types in that provision). This data spans nearly 20 years illustrating factual trends in employment to land ratio changes by sector. The utilisation of this real-world data also includes the propensity and ratios for sectors with more significant components of 'work from home' and other zoned land exclusions. Property Economics routinely test the outcomes of this demand analysis to ensure the outputs are in line with 'on-the -ground' utilisation by industrial business activities. In terms of food & beverages they form an ancillary component of industrial land provision in most district plans around the country and a proportion is applied to employment in this sector to generate ratios based on the assessed on the ground provision across a large number of assessed areas.

Category of information	Council Request	Applicant's Response
	other activities in which only part of their employment occupies industrial land (such as construction).	Trade suppliers are treated as activities that typically utilise / consume industrial land and therefore form part of the industrial activity demand.
6. Viability of retail and office space	Please assess the demand for, and viability and appropriateness of the proposed office, café and retail space on the Site. ○ The PEL report has not assessed how much retail, café or office space would be sustained on the plan change site by the site's resident households, and to what extent those activities would require an inflow of customers or workers from other places in order to be viable. While the limited pedestrian accessibility from the site to the nearest neighbourhood centre indicates it may be efficient to provide for some convenience retail supply on the plan change site, the application provides no assessment of how much would be appropriate.	As part of the proposal there is a small commercial area to meet the basic requirements of the development's resident population and visitors. The economic reality is this provision will be very small scale and likely contain only a few tenancies. Market demand will dictate what commercial provision, if any, is sustainable ultimately, but it is not of a scale that would cause any significant adverse impacts on other commercial activity in the area. Providing small convenience store types within the development is efficient as it would likely reduce trip requirements to the nearest convenience centre for frequently required needs.
7. Demand for residential land	Please provide some assessment of the demand for additional residential supply on the plan change site, in light of Auckland Council's Plan Change 78 Intensification. ○ Plan Change 78 responds to the National Policy Statement on Urban Development 2020 and requirements of the	As identified in the commentary above, this site is considered more efficient and better located than some of the more distant urban areas being promoted for residential intensification in Council's PC78. The development would in effect assist Council meet its NPS UD 2020 obligations around residential sufficiency more efficiently than the alternative.

Category of information	Council Request	Applicant's Response
	Resource Management Act by enabling more development in many parts of Auckland, including by incorporating Medium Density Residential Standards that enable three storey housing in large areas across urban Auckland. ○ Plan Change 78 enables significantly greater residential development capacity than the operative Unitary Plan, and will reduce the need for new residential zones to be created in Auckland in order to meet demand. No assessment of that demand or the implications of Plan Change 78 for demand for dwellings on the plan change site is provided in the application.	The site is close to the motorway, close to public transport and close to places of employment. The RMA does not require a 'need' assessment. It is based on effects not need. However, there has been plenty of commentary over recent years in Auckland around the need to provide more homes at price points more affordable to the market. This development would do this in an efficient location.
8. Dwelling yield	Please provide an assessment of the potential dwelling yield of the site if zoned Residential – Terraced Housing and Apartment Building zone, and provide an opinion about the economic effects of the difference in that potential yield from the proposed maximum yield. ○ The application proposes to limit the number of dwellings on the site to 200 to manage traffic effects, but that number of dwellings appears to be somewhat less than the capacity of the site under a Residential – Terraced Housing and Apartment Building zoning. Limiting the number of dwellings	In terms of THAB residential activity, my understanding there is a 200-dwelling limit due to traffic constraints. Any more than 200 dwellings is a Discretionary activity.

Category of information	Council Request	Applicant's Response
	on the site due to traffic concerns therefore represents a constraint, and an opportunity cost in relation to unconstrained development. That constraint may be relevant to assessing the most appropriate zoning of the site.	
9. Negative externalities of residential development	Please provide a discussion of the negative externalities associated with providing residential options on this site, as compared to alternatives in the rest of Auckland. ○ The PEL report provides no discussion of the costs or benefits of this site in terms of being used for residential activity. The site is adjacent to State Highway 1, Highbrook Drive and land zoned Business - Light Industry zone, is not close to commercial or other services, and may offer constrained options for active modes of transportation. These factors may negatively impact residents that would live in this location, particularly relative to other locations where high-density residential activities are enabled.	Below provides some high-level economic costs and benefits of the proposed development on the site: **Benefits**: • In close proximity to the large employment hub of Highbrook. • Adjacent to the new 20ha employment hub being developed across Highbrook Drive in the near future. • Increases Auckland 's housing choice and typologies at a lower price point than many dwellings in the market. The residential density proposed creates more affordable / serviceable properties, with lower land costs per dwelling. • The proposal has the ability to supply the market with an additional 200 dwellings. This increases the overall competitiveness and efficiency due to the intensity of the proposed development. • The proposal would lower marginal infrastructure costs and has the potential to bring with it economies of scale.

Category of information	Council Request	Applicant's Response
		• The proposal represents an efficient use of land that would otherwise likely remain vacant. **Costs**: Loss of industrial zone land, albeit this would be offset by the reality that its unlikely to be feasibly developed for industrial activity mitigating this loss almost in entirety
Geotechnical matters		
1. Liquefaction	Please comment on the liquefaction potential of these soils and the hazard that they present to future residential development here. Please outline any potential mitigation measures that would be considered (should conditions indicate they are required). ○ The geotechnical report indicates that liquefaction is considered to be a low risk to the site. We have reviewed the borehole records provided and note that in several of them, loose sandy soils (e.g. potentially liquefiable) are present within the upper 5m of the soil profile, some from almost at the surface. This is potentially indicating a higher liquefaction risk than indicated in the report text.	We note that only relevant machine boreholes were appended to the geotechnical report, most of which are outside of the site boundaries. Test pit logs and CPT outputs are also available on the NZGD, although unfortunately the CPT outputs do not include the raw data. The available test pit data is set out in **Attachment 1**. It is correct that there are thin bands of loose to dense sands identified within the available data and anticipated within the profile, however they're likely to be reasonably localised/lenticular and overlain by a sufficiently thick non-liquefiable crust to prevent surface manifestation of liquefaction. The only log sheet indicating sand from near surface is BH_65553, located beyond the southern extents of the site boundary. The attached test pits logs from within the site did not encounter any sand, although we note the test pits only extended to depths of between 1.5m and 3.0m below ground level.

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		As discussed within the Geotechnical Report, the anticipated ground conditions comprise predominantly stiff to hard cohesive material for the majority of the soil profile with very low susceptibility to classic liquefaction. Thin sand lenses may be present which are more susceptible to liquefaction, however considering the relatively low peak ground accelerations associated with the design earthquake events and the lack of any significant vertical continuity, liquefaction risk is expected to be able to mitigated with conventional approaches. Site specific investigations and liquefaction analyses are recommended to be undertaken at land development stage to support future resource consent applications. If warranted based on the findings from the investigations and analyses, conventional mitigation options such as those proposed within the Canterbury Guidance documents (e.g. geogrid reinforced rafts) are anticipated to be sufficient to address the relatively modest liquefaction hazard expected. Should the investigation and analyses identify more significant liquefaction risk, other options such as ground improvement (stone columns, rammed aggregate piers, excavation and replacement, etc) could be considered. In that scenario, and assuming laterally continuous liquefiable layers are identified, more detailed assessments of lateral spreading would be required, and if necessary, additional mitigation measures such as palisade walls or barrier walls or stone columns or rammed aggregate piers could be considered. These are all matters that are able to be addressed at the detailed resource consent preparation stage.
2. Lateral spread	Please provide comment on the lateral spread potential and hazard to future site development, plus potential mitigation measures that	Refer response to Item 1 above.

Category of information	Council Request	Applicant's Response
	would be considered for residential development (should conditions indicate they are required). ○ This request is made in light of the above query and the near surface sands.	
Noise Matters		
1. Acoustic assessment	Please provide a site-specific assessment of the traffic noise levels at the application site and their effects on proposed residential activity. This should be prepared by a person experienced in acoustics. This should include analysis of what mitigation measures are available to achieve the external and internal noise levels recommended in the NZS 6806: 2010 and which best practicable option(s) that could be adopted. ○ Whilst the internal noise levels proposed in the precinct rule are acceptable with regards to internal noise, the external noise levels recommended in the NZS6806 and in the Waka Kotahi report have not been considered and adopted in the application. The suitable mitigation options that are required to reduce the traffic noise to the guideline levels specific to	The applicant has consulted with Waka Kotahi and Auckland Transport in relation to the traffic noise levels received within the PC area. **Attachment 5** illustrates the road noise contour areas modelled and provided by Waka Kotahi in proximity to the PC area. The matter of noise attenuation to mitigate the effects of noise from State Highways (in particular State Highway 22) was extensively canvassed in PC51 (and by PC48-50 and 61) to the AUP(OP). The key matter for consideration by the Independent Hearings Panel was as to whether there needs to be precinct provisions to mitigate road noise in the THAB zone within land zoned Future Urban. The Hearings Panel decided it appropriate to include acoustic attenuation controls on habitable spaces within the THAB zone adjacent to State Highway 22 to address adverse health and amenity effects. However, the Hearings Panel decided **not** to include acoustic attenuation in relation to outdoor areas.

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	this site/location also have not been discussed in the application.	Waka Kotahi subsequently appealed the Decision on PC51. The appeal was to refine the provisions relating to internal noise environment. Waka Kotahi **did not** appeal the Hearings Panel's Decision not to include standards pertaining to external noise environment. Based on the discussions with Waka Kotahi, and in light of the above-mentioned Decision, the Highbrook Precinct proposes traffic noise attenuation within the THAB Zone in line with the Hearings Panel's Decision, with slight modification as requested by Waka Kotahi. In light of the above it is concluded that: • The road noise contour areas modelled and provided by Waka Kotahi in proximity to the PC area is sufficient and appropriate to understand the road traffic noise in the proximity of the PC area. • The road noise attenuation provisions proposed in the Highbrook Precinct align with the latest policy direction of Auckland Council's Independent Hearings Panel, as outlined in the PC51 Decision. • The road noise attenuation provisions proposed in the Highbrook Precinct are informed by discussions with Waka Kotahi. • The request for information pertaining to measures to mitigate external noise levels is not considered appropriate in light of the above discussion. • It is considered that the information requested does not align with noise management approach as set out in the AUP(OP) as it relates to the mitigation of external traffic

Category of information	Council Request	Applicant's Response
		noise environments in urban Auckland. Should the Auckland Council wish to amend its strategic approach in relation to this matter in the AUP(OP), then it is more appropriate that the Council lodge a submission on this matter at the PC notification stage.
Landscape and Design Matters		
1. Landscape visual assessment	The applicant is asked to demonstrate how the high-level outcomes relied upon within the Landscape and Visual Effects Report ("LVA"), including providing for an esplanade reserve with comprehensive planting are achieved or could be adopted into the precinct plan. ○ The LVA refers to the site being "comprehensively *planted with trees and riparian planting along the esplanade reserve to enhance its overall amenity and assist in its integration with the surrounding urban and industrial area over time*." However, no esplanade reserve is shown/provided or standards included within the precinct plan to ensure to achieve the outcome referred to in the LVA.	Answers to questions 1 and 2 on landscape visual assessment matters are collectively are set out below. The Planning Report confirms that the PC Request does not seek to incorporate the Concept Plan into the Highbrook Precinct provisions, as the PC relies on the implementation of the THAB Zone and all other provisions within the AUP(OP) to implement the development vision for the PC area. The purpose of the Concept Plan is to identify the development potential of the PC area to inform the ITA; and water, wastewater and stormwater infrastructure servicing.

Category of information	Council Request	Applicant's Response
2. Landscape visual assessment – THAB zone	Please review the LVA in the context of only those mechanisms available i.e. the proposed rezoning objective and policies of the Terrace Housing and Apartment Building ("THAB") zone and the draft precinct plan. Alternatively recommend how the stated outcomes could be incorporated into the proposed precinct plan. ○ The LVA refers to and appears to rely on the concept plan to support the change in zoning. For example, to ensure a "high level of visual amenity, comprehensively planted with trees and riparian planting along the Tamaki River corridor to enhance its overall amenity and assist in its integration with the surrounding industrial and coastal area over time". In addition, the LVA refers to positive outcomes such as providing an open space network. These outcomes, particularly the latter, are only proposed within the concept plan which does not make up part of the plan change.	In both Question 1 and 2, it appears that Council's principal concern is that while the LVA refers to the positive outcome of planting of the esplanade reserve area, the Precinct Plan does not include specific provisions pertaining to the: vesting of the esplanade reserve area; the planting of the esplanade reserve area; and the creation of an open space network within the esplanade reserve area. In regards to these concerns it is noted that: • Technical Report 6: Ecological Assessment Memo confirms that area of native plantings near the coast (within the future esplanade reserve area) are now well established, and are comprised of native species. • Chapter E38 Subdivision-Urban has a comprehensive suite of objectives and policies on esplanade reserves, including: ○ Objective E38.2(3) – seeks to ensure that land is vested to provide for esplanade reserves. ○ Policy E38.3(24) – requires esplanade reserve or strips when subdividing land adjoining the coast or other qualifying water-bodies. ○ Policy E38.3(25) – seeks to avoid reducing the width of esplanade reserve or strip, except in identified circumstances. ○ Policy E38.3(26) – requires esplanade reserves rather than esplanade strips unless identified circumstances apply. ○ Rule E38.4.1(A8) – subdivision establishing an esplanade reserve is a Restricted Discretionary Activity.

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		○ Rule E38.4.1(A9) – subdivision establishing an esplanade strip is a Restricted Discretionary Activity. ○ Rule E38.4.1(A10) – any reduction or waiver of esplanade reserves or strips is a Discretionary Activity. • Section 230 of the Resource Management Act requires that any subdivision involving creation of sites less than 4 ha and the proposed site adjoins the line of MHW or bank of a river or stream 3 m or more in width, must provide a minimum 20 m wide esplanade reserve. • One of the primary functions of esplanade reserve is to provide public access to and along water bodies. • Rule H6.6.9 of the THAB sets out a 10 m minimum coastal protection yard. It is considered that: • Alignment with the requirements of the RMA, the AUP(OP) has an extensive set of provisions which seek to ensure that esplanade reserve areas are provided at the land subdivision phase. • The THAB Zone provisions also seek to ensure that at land development stage, the coastal protection yard areas are retained. • The THAB Zone has an extensive list of matter of discretion for new dwellings to ensure good design outcomes, including the provision of landscaped areas. • Duplication of above provisions in the Highbrook Precinct is not warranted.

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		• The LVA has appropriately relied on the above provisions to ensure the delivery of high-level outcomes envisaged by the above provisions.
3. Urban Design Report – outcomes under the THAB zone	Please outline how the proposed adoption of THAB and the draft precinct provisions and standards meet the objectives, policies and design outcomes referenced within the Urban Design Report ("UD Report"). ○ A large part of the support outlined in the UD Report is a result of certain design outcomes that are not part of the plan change. These are also referenced within the Planning Report provided (Paragraph 4.9). For example, the UD report notes "intensity of development at the widest part of the PC area, with a diminishing scale and intensity to the north." The Precinct Plan provided does not address how these landscape and urban design outcomes will be achieved at later development stages. ○ The adoption of the current THAB standards and objectives and policies also do not align with achieving the outcomes sought in the Urban Design and LVA Reports.	The Planning Report confirms that the PC Request does not seek to incorporate the Concept Plan into the Highbrook Precinct provisions, as the PC relies on the implementation of the THAB Zone and all other provisions within the AUP(OP) to implement the development vision for the PC area. This approach aligns with the application of the THAB zone in most of Auckland (i.e. generally without a need for an associated precinct plan). The first step in any development design is undertaking a site analysis to understand the key attributes of the site (including its key strengths and weaknesses). The Urban Design Statement has accurately captured this information, and explained how future development can occur on the site considering the key attributes of the site, aligned with the outcomes envisaged by the THAB zone. Noting that the THAB zone provisions are generally implemented across Auckland, without a corresponding precinct plan, it is concerning that the Council's specialist view is that "the adaptation of the current THAB standards and objectives and policies also do not align with achieving the outcomes sought in the Urban Design and LVA Reports". We disagree with this statement. The THAB Zone provisions in the AUP(OP) are generic for the reason that these provisions apply to a variety of sites, each with its own set of attributes, and bespoke solutions are

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		required to achieve positive built form outcomes that take advantage of the positive attributes, while giving careful thought to the less favorable attributes of the site. The standards set out in the THAB zone are "minimum" standards only. However, under Rule H6.8.1, the Council has limited its discretion to a wide range of matters to ensure that the future development is appropriately designed having regard to the site context, including: • Building intensity, scale, location, form and appearance. • Location and design of parking and access • Maximum imperious areas • Building coverage • Outlook space • Outdoor living spaces • Minimum dwelling size • Policies H6.3(1) to (6). Overall, it is considered that: • the design outcomes as set out in the Urban Design Statement are achievable using the THAB zone provisions. • Under Rule H6.8.1, for new dwellings, Council has listed a wide range of assessment criteria (including Policies H6.3(1) to (6)) to ensure that any future resource consent

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		applications can be thoroughly assessed to achieve the outcomes articulated in the Urban Design Statement. • The Urban Design Statement explains how future development can occur on the site considering the key attributes of the site, aligned with the outcomes envisaged by the THAB zone. The Urban Design Statement confirms that aligned with Policy H6.3(2) of the AUP(OP), the proposed development of the PC area will be able to achieve high-density-built character, in terms of the height, bulk, form, landscaping and appearance of the future development in the PC area, having regard to the positive attributes of the PC area.
4. Urban Design Report – outcomes under the THAB zone	Please outline how potential acoustic mitigation e.g. potential for large blank walls (on buildings and/or free-standing acoustic walls) to manage noise could be designed in a manner that achieves a quality design outcome in the THAB zone. ○ This is not managed in the precinct plan, but relies on the objectives, policies and standards of the AUP THAB zoning.	The PC area is located adjoining State Highway 1 and Highbrook Drive. At the detailed site design stage, consideration would need to be given as to how the development interfaces with State Highway 1. Noting that the site has extensive views to the Tāmaki River environments (which provides the northern aspect to the site), access to and enjoyment of the Tāmaki River environments will be a key element of the design approach for the PC area. This would mean that future development would capitalize on views and focal points to the River. As such, it is likely that buildings would face the River, and have their "backs" to State Highway 1. With respect to achieving quality design outcomes: • This would have the benefit of "looking away" from both the National Grid infrastructure and State Highway 1. This would focus the views to the high level of amenity provided by the Tāmaki River environments.

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		• The building facades facing the State Highway 1 can be designed to achieve an appropriate level of amenity, noting the functional nature of State Highway 1 and fleeting views from State Highway 1. • Under Rule H6.8.1, for new dwellings in the THAB zone, the matters of discretion include "form and appearance". This will provide Council the ability to assess the design elements of the building facades facing State Highway 1 at the resource consent stage.
5. Urban Design Report – connectivity	Please demonstrate how the site could achieve connectivity through enabling walking, cycling and public transport and how this can be achieved by the Highbrook Precinct Transportation Plan, or other mechanisms that could be incorporated in the precinct plan. Note: The Otara – Papatoetoe Draft Greenways Plan includes aspirational long-term pedestrian connectivity for the wider area. ○ The UD Report refers to the site as being able to provide for a high degree of connectivity and will be able to accommodate the zone change, however the site is somewhat of an island and has restricted vehicle access.	Refer to the Integrated Transport Assessment Report (Technical Report 2) and the response provided on Transportation Related matters below.
Stormwater Matters		

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1. Stormwater Assets	Auckland Council's GeoMaps indicates that there is an Auckland Transport sand filter present within the site boundaries. However, it has not been identified in the proposed Stormwater Management Plan ("SMP"). In addition, the existing stormwater pond referenced in the SMP does not appear on GeoMaps as being an Auckland Council asset and its purpose is not clear. Please identify and confirm the ownership of all existing stormwater assets within the site. Please show on plans the catchments that the sand filter and pond treat. Please also confirm how the function of the existing assets will be maintained in the post development scenario and/or how their decommissioning will impact the implementation of the SMP. ○ The SMP in the plan change process acts as an assessment of stormwater effects and is also part of the Auckland Council Healthy Water's Regionwide Stormwater NDC authorisation process. An approved SMP is required for the authorisation of stormwater diversion/discharge under the NDC. ○ This information is required to enable a full assessment of stormwater effects and to meet the requirements of the	We have completed a review of the historical aerial photos on GeoMaps and undertook a site inspection to locate this sand filter. There is no visual evidence of this sand filter ever being built in the aerial photographs. Our site inspection did not reveal any sand filters on site. We can only conclude that that is incorrect information in the Auckland Council's GeoMaps.

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	Auckland Council Healthy Water's Regionwide Stormwater NDC authorisation process.	
2. SMP Implementation	The SMP identifies a number of options to provide treatment of all impervious areas. However, it is unclear how the options will be incorporated into the proposed stormwater management. It is also noted that no area is shown on the Development Concept Plan (Appendix B) for any of the stormwater treatment devices proposed in the SMP. Please confirm how the options will be incorporated into the proposed stormwater management. Please also show on plan the catchment sizes and proposed treatment devices.	The objective of the SMP (as lodged) is to support the PC Request. It is not intended for adoption into the NDC. At this stage of the PC process, without a detailed site development plan, it is considered that the identification of catchment sizes and proposed treatment devices will be of little value, as these may change in the future, depending on the form of development on the site. This SMP will be revised with the detailed design of the stormwater management system at the land development stage, when a resource consent application is lodged with the Council. At that stage, the resource consent application package, including the SMP will outline how these options are incorporated in the design of the development. However, based on the SMP that has been provided, Council should have a high level of comfort that its current strategic stormwater management framework provides sufficient guidance in terms of the future stormwater management approach, and will need to accord with the following: • Applies the most up to date stormwater provisions in respect of best practice.

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		• Be informed by the specific constraints and opportunities of the local context. • Accord with the requirements of the relevant catchment management plan. • Meet the conditions of the NDC. • Demonstrate the implementation of the objectives, policies and rules framework set out in the AUP(OP) as it relates to stormwater management and freshwater systems.
3. SMP Implementation	• Please provide more details and assessment of the proposed storm filter devices in achieving the 75% TSS required under TP10, including type of system and potential size/area.	Refer to **Attachment 6**, which contains the updated Stormwater Management Plan (Technical Report 9).
4. SMP Implementation	• Please provide details on how the proposed requirements outlined in the SMP are intended to be implemented. In particular, please confirm and clarify at what stage of the development the proposed stormwater ponds and wetland are intended to be constructed. If staging of development is proposed, please provide details on how the SMP will be implemented corresponding to each stage of development.	Refer to response to Question 2 above.
5. SMP Implementation	• Please confirm if any precinct provisions (including objectives, polices and rules) are proposed to ensure the implementation of the proposed SMP. It is unclear on how the proposed plan change as submitted will require and provide for the implementation of	Refer to response to Question 2 above. The PC Request seeks a zoning change only. It does not seek to amend the objectives, policies or rules framework of the AUP(OP) as it relates to stormwater management.

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	the proposed SMP, and hence it is unclear on how the objectives and outcomes outlined in Schedule 2 of the Regionwide Stormwater Network Discharge Consent (NDC) will be achieved.	
6. SMP Implementation	• It is stated in the SMP that the existing stormwater pond onsite which treats runoff from a section of Highbrook Drive will be decommissioned. The treatment of runoff from this section of Highbrook Drive as well as the runoff from the proposed development area is proposed to be provided in the new device(s). Please provide details on how the catchment(s) to the decommissioned device(s) will be incorporated into the stormwater management. Please also provide details on how and when the transition will happen with a residential development, including if staged.	Refer to response to Question 2 above. In principle this can be achieved by extending the inlet pipes to the new treatment device(s) to be constructed. Further details will be provided at the Resource Consent stage when detailed design will be available.
7. Outlet	• It is stated in the SMP that stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. Please provide information on the design approach of any outfall to minimise the risk of erosion and other potential adverse effects, particularly as the adjoining land will form part of an esplanade reserve on subdivision.	Refer to response to Question 2 above. This is a subject of detailed design that will be developed at a later stage. Information about how the outfall will mitigate the risk of erosion and other potential adverse effects will be supplied at the time of applying for a Resource Consent.

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		The future resource consent application will need to demonstrate the implementation of the objectives, policies and rules framework set out in the AUP(OP) as it relates to stormwater management and freshwater systems.
8. Water Quality	• Please provide an assessment of how the proposed SMP addresses stormwater quality in accordance with the policies under Section E1.3 of the AUP.	The plan change request seeks a zoning change only, it does not seek to amend the objectives, policies or rules framework of the AUP (OP) as it relates to stormwater management. The objectives and policies framework set out in Chapter E1 (Water Quality and Integrated Management) of the AUP(OP) are Auckland-wide provisions that apply to all zones. This objectives and policies framework do not generally specify a varied approach to stormwater management based on the different type of zoning, instead, a universal approach is applied to all the zones. At this stage of the Plan Change process, without a detailed site development plan, a stormwater management strategy or the plan change area will contain little information of value. However, council should have a high level of comfort that is that its current strategic stormwater management framework provides sufficient guidance in terms of the future stormwater management strategy for the plan change area. Based on the Council's current strategic framework, the future stormwater management approach within the Plan Change Area will implement an integrated stormwater management approach, and will need to accord to the following:

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		• Apply the most up to date stormwater provisions in respect of best practice; • Be informed by the specific constraints of the local context; • Meet the conditions of the Network Discharge Consent; and • Demonstrate the implementation of the objectives, policies and rules framework set out in the contaminants, effects on hydrology and fresh water systems.
9. Stormwater runoff	• Please provide details on how stormwater runoff is proposed to be managed and treated from any communal waste storage areas in apartments and multi-unit developments.	Refer to response to Question 2 above. The information requested relates to detailed design matters, which is more appropriately addressed at a resource consent stage, and not at a plan change stage.
10. Flood Risk and Hazards	• Please confirm and clarify if the proposed stormwater ponds and wetland will be located above the 10-year floodplains.	Refer to response to Question 2 above. At this PC stage, the preferred stormwater treatment device has not selected yet. The appropriate stormwater treatment device will be selected at the land development stage, informed by the holistic stormwater solution for the PC area. Notwithstanding that, the preference is to locate them above the 10-year floodplains
11. Coastal inundation	• The proposed stormwater ponds and wetland will be located within the coastal inundation 1% AEP overlay. Please confirm the design approach of these devices to minimise the risk of contaminant resuspension and other potential adverse effects.	Refer to response to Question 2 above. The locations of the treatment devices shown in this SMP are indicative. The exact location of the treatment devices (ponds/wetlands) will be finalised once the development plans are available. The detailed design to be submitted in support of the future resource consent

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		application will contain design approach to minimise sediment resuspension and other potential adverse effects.
Transportation Matters		
1. Accessibility of new THAB Zone by Non-motorised modes of transport	• Please provide further assessment of walkability and general accessibility by non-motorised users of the subject site from key services and activities, including employment, education and retail facilities, including expected travel times. An isochrone style plan would be a useful tool and basis for such an assessment. ○ There is insufficient evidence to demonstrate that accessibility of key services and land use activities from the subject site adequately fulfils the policy objectives of the THAB zone. ○ The Unitary Plan THAB Zone policy states that: The zone is predominantly located around metropolitan, town and local centres and the public transport network to support the highest levels of intensification... ○ The geographical context and location of the subject site are considered to present a disadvantage in its ability to fulfil	Isochrone (travel time contour) plans for walking and cycling accessibility are provided as **Attachments 2 and 3** to this response. These plans indicate the catchment of services and activities that could be accessed by residents of the subject site within a 5 to 30-minute timeframe. Key services and activities that typically would be of benefit or necessity to subject site residents include educational facilities, employment opportunities, retail outlets, healthcare services, and recreational/ entertainment facilities. While the walking isochrone (**Attachment 2**) indicates that there are few services / activities within a 15-minute walking timeframe, the cycling isochrone (A**ttachment 3)** indicates that it is practical modal option for accessing education, employment and retail activities. Similarly, there are a variety of recreational opportunities within a 10-15-minute cycle journey of the site.

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	this objective, insofar as it does not immediately adjoin any of the closest town centres or local centres, with main roads and other features creating barriers to transport connectivity. A comparison with other nearby areas zoned as THAB indicates that such zoning is more common within residential areas immediately adjoining local centres such as Otara and Otahuhu. ○ The THAB Zone policy further refers to the need to: - measure that residents have convenient access to services, employment, education facilities, retail and entertainment opportunities, public open space and public transport, and also that This will promote walkable neighbourhoods and increase the vitality of centres. - While the Integrated Management Plan ("ITA") refers to nearby employment, education and retail opportunities to the subject site, it does not fully assess their walkability and access by non-motorised modes from the subject site.	Accordingly, it is considered there is an adequate and appropriate level of connectivity between the site and a range of services and activities to support residential activities within the site.

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2. Scope and Viability of Proposed Shuttle Bus Service	• Please provide further assessment in relation to the expected travel functions and routes for a prospective shuttle bus service.
	• Based on the expected travel market size being generated by (approximately) 200 new residential dwellings, would this be expected to sustain services during weekday peak hours only, or would off-peak and weekend services also be expected to be viable?
	• Does the shuttle bus service require delivery of the full development to be commercially viable?
	  ○ There is insufficient assessment in relation to the scope and viability of the proposed shuttle bus service and what travel markets it would be likely to cater for (e.g., employment / retail / education related trips, and during what times of the week).
	  ○ This information is needed to better understand the potential contribution which public transport could make towards fulfilling travel demands generated by the new development. In turn, this underpins the ability of a future residential development on the site to fulfil strategic policy objectives associated with the THAB zone, such as ensuring that residents have convenient access to public transport,
		As discussed in the ITA report accompanying the Plan Change request and in previous discussion with Council / Auckland Transport the intention of the proposed shuttle service is to add to the range of potential travel mode connections between the development and nearby public transport hubs (specifically the Ōtahuhu Transport Interchange). The applicant intends to fully fund this shuttle service, thereby negating the potential for the service to a burden on Auckland Transport. The detailed operation, timetable and routes for the shuttle will be confirmed via the Transport Management Plan (as conditioned as part of the Highbrook Precinct).
		
		The provision of the shuttle is proposed as part of the Plan Change proposal. Similar requirements have been proposed for other plan changes areas in the Auckland region (e.g. Plan Change 59 – Albany 10 Precinct).

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	employment, education facilities, retail and entertainment opportunities, etc.	
3. Traffic Effects of SH1 Southbound / Highbrook Road / Hellaby's Road Roundabout upon Subject Site Intersection	• Please provide additional assessment of potential mitigation measures to ensure that vehicular access to and from the subject site is not adversely affected by queueing from the roundabout at the motorway interchange. • The ITA forecasts peak hour queue lengths on Highbrook Drive which would extend northwards beyond the proposed site access intersection. However, it does not propose mitigation to ensure that the subject site access intersection will be able to function safely and efficiently without being adversely affected by traffic effects from the downstream motorway interchange roundabout. • This information is required to confirm that safe and efficient vehicular access to and from the subject site can be achieved, which in turn underpins strategic objectives of the THAB zone, to ensure integration with adjoining land uses and efficient access to activities such as employment, education and retail opportunities and other services.	As discussed with the Council representatives in earlier communication and building on the earlier communication with AT/ WK during the pre-lodgment period, the transportation assessment reported within ITA concludes that there are a number of existing constraints imposed on the private vehicle traffic generation associated with the Plan Change site. The ITA assessment and proposed conditions of the Plan Change sought to provide a balanced transport outcome involving promotion of travel options as well as the recognition of those current constraints to minimise peak period trip generation within an existing trafficked road network.
Planning, Statutory and General Matters		

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1. Consultation with Mana Whenua	• Please provide an update on the Cultural Values Assessments that are being prepared by Ngati Te Ata and Ngāi Tai Ki Tāmaki. Pages 91 – 92 refer to Ngati Te Ata and Ngāi Tai Ki Tāmaki providing Cultural Values Assessment and these documents currently in preparation.	Refer to **Attachment 4**, which contains the Cultural Values Assessment prepared by Te Ākitai Waiohua. Cultural values assessment from Ngāti Te Ata and Ngāi Tai Ki Tāmaki have been commissioned, however, these have not been received yet.
2. Road to vest and designation uplifting	• Please provide the following information: a. If there is a timetable for the vesting of Highbrook Drive. b. What process is proposed for vesting the land for Highbrook Drive with Auckland Transport e.g. by subdivision. c. The timetable for the uplifting of the designation that applies along the western part of the site. d. The extent of the designation that may remain over the land. ○ The plan change refers to the benefit of residential zoning being the vesting of land for esplanade reserve. This may also be required if a subdivision occurs as part of the vesting of Highbrook Drive. ○ The extent of land required for the State Highway may impact on future use of the land for residential purposes and	<u>Vesting of Highbrook Drive</u> As explained in section 3 of the Planning Report, in November 2000, a Deed of Agreement was signed between Contact Energy Limited (Contact Energy) and the former Manukau City Council in which Contact Energy Limited agreed to support the then proposed Notice of Requirement for Highbrook Drive. Subsequently in 2004, an Agreement for Sale of Land for Road and Compensation was agreed between the former Manukau City Council and Contact Energy. This is a confidential agreement. One of the matters agreed was to survey the Ōtāhuhu Power Station site to identify the interests to be recorded on the Record of Title, and survey the area of the Highbrook Drive route. In accordance with this agreement, a Survey Plan SO 403357 (as agreed between Contact Energy and Auckland Transport) was approved by Land Information New Zealand in 2014. A copy of the Survey Plan SO 403357 is included in Appendix 1 of the Plan Change Request. The Survey Plan SO 403357 details the exact areas of • Land to be acquired for public road (e.g Highbrook Drive)

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	any potential mitigation/standards set out in the precinct plan (s176 of the RMA).	• Severance lots • Land to be acquired for motorway purposes • Easements for various services (water, wastewater, stormwater) While Survey Plan SO 403357 was approved by Land Information New Zealand, the final step to legalise the land for Highbrook Drive has not yet been completed (i.e the land has not been legally vested into AT). The owners of the subject land are currently in the process of dismantling the infrastructure on the Ōtāhuhu Power Station site (PC site). The owners of the site and AT are working through a number of matters pertaining to the existing infrastructure underneath Highbrook Drive, prior to the land being vested into AT, as per the agreement. The timing for the vesting of Highbrook Drive does not have any implications for the PC Request. The subdivision of the area for Highbrook Drive has already been approved by Land Information New Zealand. AT has already agreed to the surveyed boundaries of Highbrook Drive. The land for future esplanade reserves has not been identified in Survey Plan So 403357. There could be two reasons for this: • The allotment subject to the PC Request is greater than 4 ha, and therefore is not subject to section 230 of the RMA. Under section 230 of the RMA, requirement for esplanade reserves or esplanade strips applies to any allotment of less than 4 ha. • The requirement for esplanade reserves or esplanade strips under section 230 of the RMA only apply where section 11(1)(a) of the RMA applies, and does not apply to

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		section 11(1)(b) which relates to subdivisions affected by the acquisition, transfer, or disposal of part of an allotment under the Public Works Act 1981. <u>Uplifting of parts of Designation 6714, State Highway 1</u> The Survey Plan SO 403357 clearly identifies areas to be vested for motorway purposes. Waka Kotahi has agreed to the surveyed boundaries shown in this Survey Plan. Waka Kotahi has confirmed that in principle it will agree to the uplifting of the designation from the PC area, subject to an agreement on the access to the Waka Kotahi's stormwater infrastructure (which is shown in the Survey Plan SO 403357) and the legalisation of Highbrook Drive. It is considered that the PC Request can proceed based on the in-principle agreement from Waka Kotahi to uplift Designation 6714 over the PC area. The applicant acknowledges that section 176 of the RMA will continue to apply until part of Designation 6714 is uplifted from the PC area. It is considered that there is no need to duplicate section 176 of the RMA requirements into the Highbrook Precinct Plan).
3. National Policy Statement on Electricity Transmission	• Please provide an assessment of the National Policy Statement on Electricity Transmission.	The mapped extent of the National Grid Subdivision Corridor extends minutely into the PC area. The AUP(OP) gives effect to the National Policy Statement on Electricity Transmission through the implementation of the National Grid Corridor Overlay provisions. The PC Request does not seek to amend the National Grid Corridor Overlay provisions.

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	Note: While the AUP recognises and provides for electricity transmission through the National Grid Corridor, for completeness this NPS should be addressed in section 8 of the planning report.	
4. Recent plan changes/section 32	• Please provide an assessment of Plan Changes 78, 79 and 80 as part of the assessment of statutory documents (section 8 of the planning report). Note: Parts of PC78 have immediate legal effect. Objectives and policies of these plan changes require consideration as part of the assessment. This includes effects of climate change, particularly given the sites coastal location. Coastal erosion and coastal inundation are spatially identified qualifying matters applying to the plan change area.	The plan change request seeks a zoning change only, it does not seek to amend the objectives, policies or rules framework of the AUP (OP) that relate to the Terrace House and Apartment Zone. <u>PC78</u> • PC78 responds to the National Policy Statement on Urban Development and seeks to achieve intensification in Auckland. The PC Request seeks intensification of residential development within the PC area, supported by a range a technical reports. • PC78 identifies wetland management areas overlay as a qualifying matter. There is no wetland within the PC area. This is not relevant for the PC Request • PC78 identifies Outstanding Natural Features Overlay and Outstanding Natural Landscapes Overlay as a qualifying matter. This is not relevant for the PC Request. • PC78 identifies Emergency Management Areas (Chapter E29) as a qualifying matter. This is not relevant for the PC Request. • PC78 identifies Natural Hazards and flooding (Chapter E36) as a qualifying matter. The PC Request does not seek to amend the provisions of Chapter E36. All future development within the PC Request area will need to comply with the requirements of Chapter E36. The map below illustrates the extent of the indicative mapping of the

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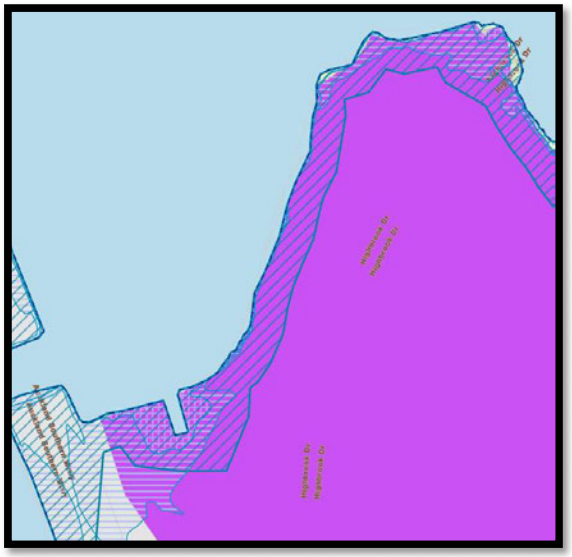
		Coastal Erosion (dark blue lines) and Coastal Inundation (light blue lines) areas as shown in the Council's GIS viewer for PC78. It clearly illustrates that the indicative extent of the Coastal Erosion and Coastal Inundation is located generally within the 20m riparian margin areas. The coastal inundation areas shown in the map below are limited to discrete areas, generally within the future esplanade reserve areas.  • With respect to coastal erosion mapping, the Highbrook Geotechnical Appraisal (Technical Report 3) confirms that wave action is not expected in the Tāmaki River, and therefore the risk of erosion affecting the proposed development is considered highly unlikely. Furthermore, the future esplanade reserve areas and coastal yard setbacks will ensure that building platforms are not detrimentally affected by coastal

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		erosion processes. It is further noted that the matters pertaining to climate change and effects on the PC area are explained in the Highbrook Stormwater Management Plan. It is considered that the site-specific assessment should be given priority over the generic modelling results shown in Council's GIS viewer for PC78. Plan Change 79: PC79 seeks to manage impacts of Auckland's transport network, with a focus on pedestrian safety, accessible car parking, loading and heavy vehicle management, and catering for EV-charging and cycle parking. The PC Request seeks a zoning change only, and does not seek to amend the objectives, policies or rules framework of Chapter E27 Transport of the AUP (OP). The PC Request aligns with PC78 as: • All provision of Chapter E27 Transport and other matters sets out in PC78 will be implemented at land development stage. The PC Request does not seek to amend any of the proposed amendments set out in PC78. • PC Request proposes upgrades to the shared pedestrian and cycling pathway and the installation of pedestrian barriers in identified locations. The recommendation of an additional bus stop on Highbrook drive and private shuttles to Middlemore and Otahuhu train station provides a resilient solution in encouraging the public transport uptake rather than emphasis on the roading network. Plan Change 80:

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		PC80 proposes amendments to Chapter B Regional Policy Statement of the AUP(OP). PC80 seeks to integrate the concept of well-functioning environment, urban resilience to climate change and qualifying matters introduced through the NPS-UD into the RPS. The evaluation of the PC Request against the NPS-UD is set out in the Planning Report. With respect to climate change matters, please refer to the response on PC78, and the Highbrook Stormwater Management Plan, which applies climate change to pre-development and post-development scenarios.

4. Regional Policy Statement/section 32	• Please provide an assessment against RPS Chapters B8 Coastal Environment and B10 Environmental Risk (including PC 80 – also see above). Note: The plan change is required to give effect to the AUP RPS under s75 of the RMA. Chapters B8 and B10 are relevant. While the assessment required may not be as extensive as Chapters B2 and B3, the relevant provisions should be identified and assessed.	An assessment of the PC Request against the RPS is set out in paragraphs 8.32 to 8.34 of the Planning Report. An assessment of the PC Request against the Chapter B8 and coastal environment outcomes is also set out in paragraphs 6.8 to 6.13 of Technical Report 4 Assessment of Landscape and Visual Effects. In brief: • Chapter B8.2 seeks to ensure that areas of coastal environment with outstanding and high natural character are preserved and protected from inappropriate subdivision, use and development. In this respect, the PC area does not contain a coastal environment deemed to be of outstanding or high natural character. Chapter B8.3 seeks to ensure that subdivision, use and development in the coastal environment are designed, located and managed to preserve the characteristics and qualities that contribute to the natural character of the coastal environment. In this regard, it is noted that the THAB zone is an existing zone in the AUP(OP). It has already undergone a section 32 assessment as part of the Unitary Plan development process and it has been concluded that it gives effect to the RPS. The development of new dwelling is a restricted discretionary activity in the THAB zone, and matters of discretion include building intensity, scale, location, form, and appearance. The resource consent application approval process will ensure that the future subdivision, use and development within the PC area is designed, located and managed to contribute to the natural character of the coastal environment. • Chapter 8.4 seeks to ensure that public access to and along the coastal marine area is maintained and enhanced. In this regard, it is noted that via the implementation of the

		relevant sections the AUP(OP), in particular the subdivision chapter, and the coastal yard setback (as set out in the THAB Zone), areas subject to future esplanade reserves will be vested into Council and/or future building platforms will be located outside the esplanade reserve areas to ensure that public access to and along the coastal marine area is not adversely affected, but rather enhanced. • Chapter B10 seeks to ensure that communities are more resilient to natural hazards and effects of climate change. In this regard refer to commentary on PC78 and PC80 above.

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5. Section 32/options	• Please provide an assessment of why the proposal cannot be achieved by only a residential zoning (i.e. without a precinct plan). Note: The section 32 considers two zoning options but does not specifically address the benefits and costs of imposing a precinct over the plan change area to deliver the mitigation measures recommended.	The Planning Report and the supporting Technical Reports provided to Council should be read as a holistic document. The Technical Reports identify the key resource management issues of relevance to the PC area, and its proximity. The Planning Report assesses the viable options available informed by the findings of the Technical Reports. As such, paragraph 6.2 of the Planning Report, clearly identifies that the "proposal" means to rezone the PC area from Light Industry Zone to THAB Zone and apply the proposed Highbrook Precinct. It is considered that the requirements of section 32 of the RMA have been met.
6. Section 32/options	• Please comment on whether the preferred outcome of a THAB zone with a permitted activity limit of 200 units is consistent with achieving the greatest density, height and scale of development of all the residential zones. Note: The THAB zone has the highest intensity of all the residential zones. There is no limit on the number of units in this zone (or the Mixed Housing Urban zone).	We agree that the THAB Zone is highest density residential zone. The Highbrook Precinct does not impose an upper limit on the number of dwellings within the precinct. New dwellings in the THAB Zone is a Restricted Discretionary Activity. The proposed standard I4.6.1 specifies that the Restricted Discretionary Activity status applies to a maximum of 200 dwellings. The Highbrook Precinct Plan changes the activity status of dwellings (where it exceeds 200) to a Discretionary Activity. The rational for this is set out in the precinct description and Policy I4.3(3). An ITA is required to be support the Discretionary Activity resource consent.
7. 14.1 Precinct Description	• Please consider adding: • The extent of area e.g. 4.4 hectares included in the precinct.	One of the AUP(OP) drafting principles is that the precinct descriptions should be brief and reliance should be on the objectives and policies to inform the key outcomes. As such, it is considered that no change to the precinct description is required.

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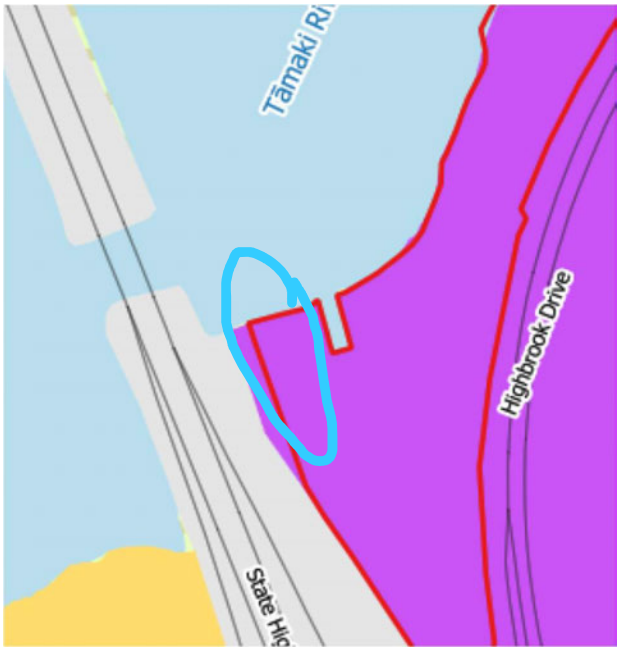
	• Reference to protecting activities sensitive to noise as this is one of the precinct plan objectives. Clarity of provisions / extent of precinct area.	
8. 14.2 Objectives – relationship with other parts of the AUP • 14.3 Policies - • relationship with other parts of the AUP •	• Please consider moving the following text above the section to which they relate • 'All relevant overlay, Auckland-wide and zone objectives apply in this precinct in addition to those specified above below.' • 'All relevant overlay, Auckland-wide and zone policies apply in this precinct in addition to those specified above below.' Consistency with other precinct plans.	There is a mixture of approaches in the precinct plans in the AUP(OP) in relation to where cross-referencing text is placed within the precinct provisions. As such, it is considered that no change in this regard is required.
9. 14.3 Policies	• Please consider re-drafting policy 14.3(3). The intent is understood, but it currently reads as a method rather than an outcome.	Policy I4.3(3) would apply to a Discretionary Activity resource consent. The AUP(OP) does not identify the assessment criteria for Discretionary Activities. The reliance is placed on objectives and policies is clearly articulate the outcomes, or key matters for assessment to guide the decision makers. Policy I4.3(3) uses policy drafting terminology, through the use of the term "require", and then articulates the outcome. It is considered that Policy I4.3(3) is appropriate from a policy drafting perspective.

Category of information	Council Request	Applicant's Response
10. Table 14.1.1 Activity table	• Please explain the reason for difference in the activity status of (A1) and (A2). See PL 13	Precincts enable local differences to be recognized by providing place-based provisions to vary the outcomes sought in the respective zone or Auckland-wide provisions and can be more restrictive or more enabling. The precinct drafting principles are that an activity status rule must be included in the precinct activity table if that activity: • Requires a different activity status from that given to the same activity by an overlay, Auckland-wide or zone; • Is subject to additional precinct-specific standards relating to that activity. Having regard to the above, the Technical Reports supporting the PC Request have identified a number of place-based provisions which are recommended for the PC area that would not be addressed by the proposed THAB zone provisions, and therefore, require bespoke set of provision. The Highbrook Precinct proposes five new standards which are set out in Rule I4.6. These standards apply to all permitted, controlled and restricted discretionary activities, and in additional to all the standards that apply in the THAB zone. These five new proposed standards relate to: • Maximum number of dwellings • Highbrook Precinct Transportation Plan • Upgrading of shared cycle / pedestrian path and pedestrian barrier

Category of information	Council Request	Applicant's Response
		• Construction of bus stop • Road noise attenuation. In light of the introduction of new standards, we then need to specify the activity status for the infringement of these standards (consistent with the approach of the AUP(OP) drafting princples). In this regard, in Rule I4.4.1: • (A1) specifies that non-compliance with Standard I4.6.5 (road noise attenuation) is a Restricted Discretionary activity. • (A2) specifies that the breach of all other four standards is a Discretionary activity.
11. Standard 14.6.2 Highbrook Precinct Transportation Plan	• Please consider redrafting as this does not read as a standard. Rules/standards should have a measurable outcome. This standard is worded as an assessment process.	It is common for standards to require the preparation of specific plans to address resource management issues of concern (e.g. an archaeological management plan, a landscape plan etc). Aligned with this approach, the "outcome" or deliverable of Standard I4.6.2 is the Highbrook Precinct Transportation Plan. The standard sets out the matters to be included in the Transportation Plan. Any future resource consent application will need to illustrate compliance with this standard, by producing the Transportation Plan which includes the matters set out in the standard. It is considered that no changes are required Standard I4.6.2.
12. Standard 14.6.5 Road noise attenuation	• Pending responses for the request for a site-specific acoustic assessment.	Refer to the response on Noise Matters.

Category of information	Council Request	Applicant's Response
• 14.8.1 Matters of discretion • (1) Non-compliance with Standard I4.6.5 – Road noise attenuation • 14.8.2 Assessment criteria (2)		The road noise attenuation provisions proposed in the Highbrook Precinct align with the latest policy direction of Auckland Council's Independent Hearings Panel, as outlined in the PC51 Decision.
13. 14.8.2 Assessment criteria (2) Transport matters	• Please refer the relevance of this criterion to activity (A1), or the activity status of (A2). It appears this criterion is related to activity (A2), which is a discretionary activity. These are relevant matters but are unable to be addressed if the activity status is discretionary.	The text below Rule I4.8.2 explains that the assessment criteria in this section applies to restricted discretionary activities. As such, it would apply to all restricted discretionary activities set out in the Precinct activity table (being Rule I4.4.1(A1)) and those in the activity table in the THAB zone. It would not apply to (A2) as Rule I4.4.1 clearly specifies that (A2) is a Discretionary Activity. Rule I4.8.2(1) sets out the assessment criteria for any activity that does not comply with Standard I4.6.5 – Road noise attenuation. Rule I4.8.2(2) sets out the assessment criteria that applies to all relevant activities which are a Restricted Discretionary Activity in the THAB zone activity table (including "dwellings"), enables council to consider transportation matters, in particular, the prior to the occupation

Category of information	Council Request	Applicant's Response
		of the first dwelling, the extent to which provision has bene made for a private shuttle bus service. There is nothing precluding the consideration of Rule I4.8.2(2) for discretionary activity resource consent, but as currently drafted, it is specific to Restricted Discretionary activities to capture the activity dwellings.
14. 14.9 Special information requirements	• Please consider listed the following: a. Precinct Transportation Plan; and b. Acoustic assessment. These documents are referred to in the standards/assessment criteria.	Generally, matters are included in the section I4.9 where further clarity needs to be provided in terms of how that information is to be provided, for example, what details are to be included in the Planting and Landscaping Plan. In this case, Standard I4.6.2 adequately sets out the matters to be included in the Highbrook Precinct Transportation Plan, and as such, there is no need to duplicate the same information in the special information requirements. The applicant does not support the requirement for an acoustic assessment as explained in the response on Noise Matters.
15. 14.10.1 Highbrook Precinct plan map	Please confirm: a. The extent of the precinct area relates only to land zoned Business – Light Industry, or if there is a discrepancy between the survey from 2014 and the coastal boundary of the site as shown on planning maps.	The extent of the precinct area has been determined by the Survey Plan SO 403357 and approved by Land Information New Zealand in 2014. We suspect that the boundaries as shown on the Council's GIS maps has not yet been updated to reflect the surveyed property boundaries as it applies to the mean high-water spring boundary. We note that there are minute differences in this regard. Our mapping correctly maps the surveyed boundary of the

Category of information	Council Request	Applicant's Response
	b. Why a portion of land along the eastern boundary with SH1 is excluded from Highbrook Precinct (indicated in blue). It is understood from the Planning report the precinct plan only relates to land zoned Business – Light Industry however, parts of the map appear to include land within Mean High Water Spring Tide.  	property when adjoining the mean high-water spring boundary. We infer that the Council's GIS map boundaries will be updated then Survey Plan SO 403357 has been legalized. The subject land that is excluded (adjoining State Highway 1) from the proposed rezoning is the stormwater management area for State Highway 1. When this land is vested into Waka Kotahi, it will become part of the Strategic Transport Corridor Zone (Chapter H22 of the AUP(OP)). The Strategic Transport Corridor Zone applies to NZTA and KiwiRail designated land.

Category of information	Council Request	Applicant's Response
16. 14.10.1 Highbrook Precinct plan map	Please consider the following amendments to the map: a. Indicative location of the bus stop. b. The pedestrian barrier to be installed identified in a different colour to the extent of the precinct. c. The shared pedestrian pathway/cycleway to be upgraded identified in different colour to the other features on the map. d. The indicative (or defined) coastal boundary be shown relative to the precinct plan area. This may be assisted by showing the Tāmaki River and Ōtara Creek in blue. e. The motorway be marked. To improve the linkage between the text and the diagram, and clarify parts of the map, aspects could be refined.	Bus stop – The requirement for the construction of the bus stop is set out in Standard I4.6.4. Based on our discussions with AT, it is more appropriate that the location of the bus stop be confirmed in consultation with AT at the land development stage. Therefore, the inclusion of an indicative bus stop location without AT confirmation is not supported. Pedestrian barrier, pedestrian/cycle pathway, coastal boundary, motorway – updated as requested, refer to the updated Highbrook Precinct Plan in Attachment 7.

13 September 2022

Babbage Consultants Limited
Level 4, 68 Beach Road
Auckland Central 1010
Attention: Sukhi Singh

Sent via email: sukhi.singh@babbage.co.nz

Dear Sukhi,

Clause 23 RMA further information: private plan change request – 8 Sparky Road, Ōtara (Highbrook Living Limited)

Further to the private plan change request by Highbrook Living Limited under Clause 21 to Schedule 1 of the Resource Management Act 1991 (RMA) in relation to part of 8 Sparky Road, Ōtara, Auckland, Council has now completed an assessment of the information supplied.

Pursuant to Clause 23 of the RMA Auckland Council requires further information to continue processing the private plan change request. Table 1 in Appendix 1 to this letter sets out the nature of the further information required and the reasons for the request. This incorporates reviews undertaken by Council appointed specialists.

The further information is requested under section 23(1)(a) – (d) of the RMA to better understand:

(a) the nature of the request in respect of the effect it will have on the environment, including taking into account the provisions of Schedule 4; or
(b) the ways in which any adverse effects may be mitigated; or
(c) the benefits and costs, the efficiency and effectiveness, and any possible alternatives to the request; or
(d) the nature of any consultation undertaken or required to be undertaken.

Should you wish to discuss this matter or seek a meeting to clarify points in this letter please do not hesitate to contact me.

Yours faithfully

Tania Richmond
Consultant Planner on behalf of Plans and Places Department, Chief Planning Office
tania@richmondplanning.co.nz
09 521 4639, 027 681 7799

Clause 23 request approved by:

Celia Davison
Manager Planning – Central south
Plans and Places Department
Chief Planning Office

Reference	Category of information	Specific request	Reason for request
Economic – Derek Foy, Formative			
Eco 1	Industrial land occupation 2017-2022	Please provide an assessment of the amount of land that was identified as being vacant in 2017 but which is now no longer vacant.	The Property Economics Limited document titled "Highbrook Proposed Plan Change Economic Overview", November 2021 ("PEL") uses Auckland Council's "Housing and Business Development Capacity Assessment 2017" ("HBCA") as a base for assessing industrial land demand and supply. The vacant land supply estimates in the HBCA are now at least five years old, and some of the land that was vacant in 2017 will now no longer be vacant, having been developed in the interim. An updated (2022) estimate of vacant land supply would be a better basis for the industrial land demand-supply assessment than the 2017 data. The PEL report refers to "Building Consent Statistics – Statistics New Zealand" data, which would be useful for this assessment, but has not been used.
Eco 2	Ability to accommodate industrial activity	Please provide an assessment of the range of parcel sizes and building sizes in nearby industrial zones such as Highbrook and East Tamaki, and assessment of the range of activities permitted on the site under the operative Business – Light Industry zoning.	The PEL report states that the site is not efficient or practical for light industry activities, however there appear to be many industrial zoned parcels and industrial buildings that are of a size that could be accommodated on the site, including across a wide range of activities that are permitted in the operative Light Industry zone.
Eco 3	Economic efficiency of industrial land within this location	Please provide a discussion of the economic efficiency of this site being used for industrial activities, as compared to those activities being accommodated instead on alternative locations elsewhere in Auckland.	The PEL report and the Planning Report both note the site's good vehicle accessibility, however the PEL report provides no discussion of the benefits of the site accommodating industrial activity relative to other

Reference	Category of information	Specific request	Reason for request
		This discussion should also refer to the likely growth in residential capacity in established parts of Auckland as a result of Plan Change 78 Intensification.	potential locations. Many of the other places where industrial activities might locate if they were unable to establish on the site are located around the Auckland urban periphery, such as in the structure plan areas identified in the PEL report. Plan Change 78 will significantly increase residential capacity, and therefore probably also population growth, in areas closer to central Auckland, requiring for that population employment opportunities that are easy to access.
Eco 4	Employment yield of the site	Please provide an assessment of the potential employment yield of the plan change site under the operative Business - Light Industry zone and the proposed Residential – Terraced Housing and Apartment Building zone. This should discuss the relative merits of providing the assessed quantum of employment on the site compared to some alternative location, such as one of the structure plan areas identified in the PEL assessment.	The number of workers able to be accommodated on the site is a relevant economic impact to consider when evaluating the merits of the proposal.
Eco 5	Industrial sector definition	Please provide detail on the method used to define the industrial ratios adopted in Appendix 1 of the PEL report, and explain the rationale for the inclusion and exclusion of component activities.	The ratios in Appendix 1 are a key input into the PEL report's demand assessment, but they are only described as being based on empirical data. It would assist interpretation of the assessment to understand to what extent the ratios are based on expert opinion. As explained in the economics report, "industrial activities" are those that drive demand for industrial land, but the ratios do not appear to include some activities that are permitted in the Business - Light Industry zone (such as

Reference	Category of information	Specific request	Reason for request
			food and beverages and trade suppliers). Nor does it include all of other activities in which only part of their employment occupies industrial land (such as construction).
Eco 6	Viability of retail and office space	Please assess the demand for, and viability and appropriateness of the proposed office, café and retail space on the Site.	The PEL report has not assessed how much retail, café or office space would be sustained on the plan change site by the site's resident households, and to what extent those activities would require an inflow of customers or workers from other places in order to be viable. While the limited pedestrian accessibility from the site to the nearest neighbourhood centre indicates it may be efficient to provide for some convenience retail supply on the plan change site, the application provides no assessment of how much would be appropriate.
Eco 7	Demand for residential land	Please provide some assessment of the demand for additional residential supply on the plan change site, in light of Auckland Council's Plan Change 78 Intensification.	Plan Change 78 responds to the National Policy Statement on Urban Development 2020 and requirements of the Resource Management Act by enabling more development in many parts of Auckland, including by incorporating Medium Density Residential Standards that enable three storey housing in large areas across urban Auckland. Plan Change 78 enables significantly greater residential development capacity than the operative Unitary Plan, and will reduce the need for new residential zones to be created in Auckland in order to meet demand. No assessment of that demand or the implications of Plan Change 78 for demand for dwellings on the plan change site is provided in the application.

Reference	Category of information	Specific request	Reason for request
Eco 8	Dwelling yield	Please provide an assessment of the potential dwelling yield of the site if zoned Residential – Terraced Housing and Apartment Building zone, and provide an opinion about the economic effects of the difference in that potential yield from the proposed maximum yield.	The application proposes to limit the number of dwellings on the site to 200 to manage traffic effects, but that number of dwellings appears to be somewhat less than the capacity of the site under a Residential – Terraced Housing and Apartment Building zoning. Limiting the number of dwellings on the site due to traffic concerns therefore represents a constraint, and an opportunity cost in relation to unconstrained development. That constraint may be relevant to assessing the most appropriate zoning of the site.
Eco 9	Negative externalities of residential development	Please provide a discussion of the negative externalities associated with providing residential options on this site, as compared to alternatives in the rest of Auckland.	The PEL report provides no discussion of the costs or benefits of this site in terms of being used for residential activity. The site is adjacent to State Highway 1, Highbrook Drive and land zoned Business - Light Industry zone, is not close to commercial or other services, and may offer constrained options for active modes of transportation. These factors may negatively impact residents that would live in this location, particularly relative to other locations where high density residential activities are enabled.
Geotechnical – James Beaumont, Riley			
Geo 1	Liquefaction	Please comment on the liquefaction potential of these soils and the hazard that they present to future residential development here. Please outline any potential mitigation measures that would be considered (should conditions indicate they are required).	The geotechnical report indicates that liquefaction is considered to be a low risk to the site. We have reviewed the borehole records provided and note that in several of them, loose sandy soils (e.g. potentially liquefiable) are present within the upper 5m of the soil profile, some from

Reference	Category of information	Specific request	Reason for request
			almost at the surface. This is potentially indicating a higher liquefaction risk than indicated in the report text.
Geo 2	Lateral spread	Please provide comment on the lateral spread potential and hazard to future site development, plus potential mitigation measures that would be considered for residential development (should conditions indicate they are required).	This request is made in light of the above query and the near surface sands.
Noise – Bin Qiu, Auckland Council, contamination, air and noise			
Noise 1	Acoustic assessment	Please provide a site-specific assessment of the traffic noise levels at the application site and their effects on proposed residential activity. This should be prepared by a person experienced in acoustics. This should include analysis of what mitigation measures are available to achieve the external and internal noise levels recommended in the NZS 6806: 2010 and which best practicable option(s) that could be adopted.	Whilst the internal noise levels proposed in the precinct rule are acceptable with regards to internal noise, the external noise levels recommended in the NZS6806 and in the Waka Kotahi report have not been considered and adopted in the application. The suitable mitigation options that are required to reduce the traffic noise to the guideline levels specific to this site/location also have not been discussed in the application.
Landscape and design – Gabrielle Howdle, Auckland Council, design review			
LS 1	Landscape visual assessment	The applicant is asked to demonstrate how the high-level outcomes relied upon within the Landscape and Visual Effects Report ("LVA"), including providing for an esplanade reserve with comprehensive planting are achieved or could be adopted into the precinct plan.	The LVA refers to the site being "comprehensively *planted with trees and riparian planting along the esplanade reserve to enhance its overall amenity and assist in its integration with the surrounding urban and industrial area over time*." However, no esplanade reserve is shown/provided or standards included within the precinct

Reference	Category of information	Specific request	Reason for request
			plan to ensure to achieve the outcome referred to in the LVA.
LS 2	Landscape visual assessment – THAB zone	Please review the LVA in the context of only those mechanisms available i.e. the proposed rezoning objective and policies of the Terrace Housing and Apartment Building ("THAB") zone and the draft precinct plan. Alternatively recommend how the stated outcomes could be incorporated into the proposed precinct plan.	The LVA refers to and appears to rely on the concept plan to support the change in zoning. For example, to ensure a "high level of visual amenity, comprehensively planted with trees and riparian planting along the Tamaki River corridor to enhance its overall amenity and assist in its integration with the surrounding industrial and coastal area over time". In addition, the LVA refers to positive outcomes such as providing an open space network. These outcomes, particularly the latter, are only proposed within the concept plan which does not make up part of the plan change.
UD 1	Urban Design Report – outcomes under the THAB zone	Please outline how the proposed adoption of THAB and the draft precinct provisions and standards meet the objectives, policies and design outcomes referenced within the Urban Design Report ("UD Report").	A large part of the support outlined in the UD Report is a result of certain design outcomes that are not part of the plan change. These are also referenced within the Planning Report provided (Paragraph 4.9). For example, the UD report notes "intensity of development at the widest part of the PC area, with a diminishing scale and intensity to the north." The Precinct Plan provided does not address how these landscape and urban design outcomes will be achieved at later development stages. The adoption of the current THAB standards and objectives and policies also do not align with achieving the outcomes sought in the Urban Design and LVA Reports.

Reference	Category of information	Specific request	Reason for request
UD 2	Urban Design Report – outcomes under the THAB zone	Please outline how potential acoustic mitigation e.g. potential for large blank walls (on buildings and/or free-standing acoustic walls) to manage noise could be designed in a manner that achieves a quality design outcome in the THAB zone.	This is not managed in the precinct plan, but relies on the objectives, policies and standards of the AUP THAB zoning.
UD 3	Urban Design Report – connectivity	Please demonstrate how the site could achieve connectivity through enabling walking, cycling and public transport and how this can be achieved by the Highbrook Precinct Transportation Plan, or other mechanisms that could be incorporated in the precinct plan. Note: The Otara – Papatoetoe Draft Greenways Plan includes aspirational long-term pedestrian connectivity for the wider area.	The UD Report refers to the site as being able to provide for a high degree of connectivity and will be able to accommodate the zone change, however the site is somewhat of an island and has restricted vehicle access.
Stormwater – Therese Malcom, Jacobs (for Healthy Waters, Auckland Council)			
SW 1	Stormwater Assets	Auckland Council's GeoMaps indicates that there is an Auckland Transport sand filter present within the site boundaries. However, it has not been identified in the proposed Stormwater Management Plan ("SMP"). In addition, the existing stormwater pond referenced in the SMP does not appear on GeoMaps as being an Auckland Council asset and its purpose is not clear. Please identify and confirm the ownership of all existing stormwater assets within the site. Please show on plans the catchments that the sand filter and pond treat. Please also confirm how the function of the	The SMP in the plan change process acts as an assessment of stormwater effects and is also part of the Auckland Council Healthy Water's Regionwide Stormwater NDC authorisation process. An approved SMP is required for the authorisation of stormwater diversion/discharge under the NDC. This information is required to enable a full assessment of stormwater effects and to meet the requirements of the Auckland Council Healthy Water's Regionwide Stormwater NDC authorisation process.

Reference	Category of information	Specific request	Reason for request
		existing assets will be maintained in the post development scenario and/or how their decommissioning will impact the implementation of the SMP.	
SW 2	SMP Implementation	The SMP identifies a number of options to provide treatment of all impervious areas. However, it is unclear how the options will be incorporated into the proposed stormwater management. It is also noted that no area is shown on the Development Concept Plan (Appendix B) for any of the stormwater treatment devices proposed in the SMP. Please confirm how the options will be incorporated into the proposed stormwater management . Please also show on plan the catchment sizes and proposed treatment devices.	
SW 3	SMP Implementation	Please provide more details and assessment of the proposed storm filter devices in achieving the 75% TSS required under TP10, including type of system and potential size/area.	
SW 4	SMP Implementation	Please provide details on how the proposed requirements outlined in the SMP are intended to be implemented. In particular, please confirm and clarify at what stage of the development the proposed stormwater ponds and wetland are intended to be constructed. If staging of development is proposed, please provide details on how the SMP will be implemented corresponding to each stage of development.	

Reference	Category of information	Specific request	Reason for request
SW 5	SMP Implementation	Please confirm if any precinct provisions (including objectives, polices and rules) are proposed to ensure the implementation of the proposed SMP. It is unclear on how the proposed plan change as submitted will require and provide for the implementation of the proposed SMP, and hence it is unclear on how the objectives and outcomes outlined in Schedule 2 of the Regionwide Stormwater Network Discharge Consent (NDC) will be achieved.	
SW 6	SMP Implementation	It is stated in the SMP that the existing stormwater pond onsite which treats runoff from a section of Highbrook Drive will be decommissioned. The treatment of runoff from this section of Highbrook Drive as well as the runoff from the proposed development area is proposed to be provided in the new device(s). Please provide details on how the catchment(s) to the decommissioned device(s) will be incorporated into the stormwater management. Please also provide details on how and when the transition will happen with a residential development, including if staged.	
SW 7	Outlet	It is stated in the SMP that stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. Please provide information on the design approach of any outfall to minimise the risk of erosion and other potential adverse effects, particularly as the adjoining land will form part of an esplanade reserve on subdivision.	

Reference	Category of information	Specific request	Reason for request
SW 8	Water Quality	Please provide an assessment of how the proposed SMP addresses stormwater quality in accordance with the policies under Section E1.3 of the AUP.	
SW 9	Stormwater runoff	Please provide details on how stormwater runoff is proposed to be managed and treated from any communal waste storage areas in apartments and multi-unit developments.	
SW 10	Flood Risk and Hazards	Please confirm and clarify if the proposed stormwater ponds and wetland will be located above the 10-year floodplains.	
SW 11	Coastal inundation	The proposed stormwater ponds and wetland will be located within the coastal inundation 1% AEP overlay. Please confirm the design approach of these devices to minimise the risk of contaminant resuspension and other potential adverse effects.	
Transportation – Andrew Temperley, Traffic Planning Consultants			
TP 1	Accessibility of new THAB Zone by Non-motorised modes of transport	Please provide further assessment of walkability and general accessibility by non-motorised users of the subject site from key services and activities, including employment, education and retail facilities, including expected travel times. An isochrone style plan would be a useful tool and basis for such an assessment.	There is insufficient evidence to demonstrate that accessibility of key services and land use activities from the subject site adequately fulfils the policy objectives of the THAB zone. The Unitary Plan THAB Zone policy states that: *The zone is predominantly located around metropolitan, town and local centres and the public transport network to support the highest levels of intensification…*

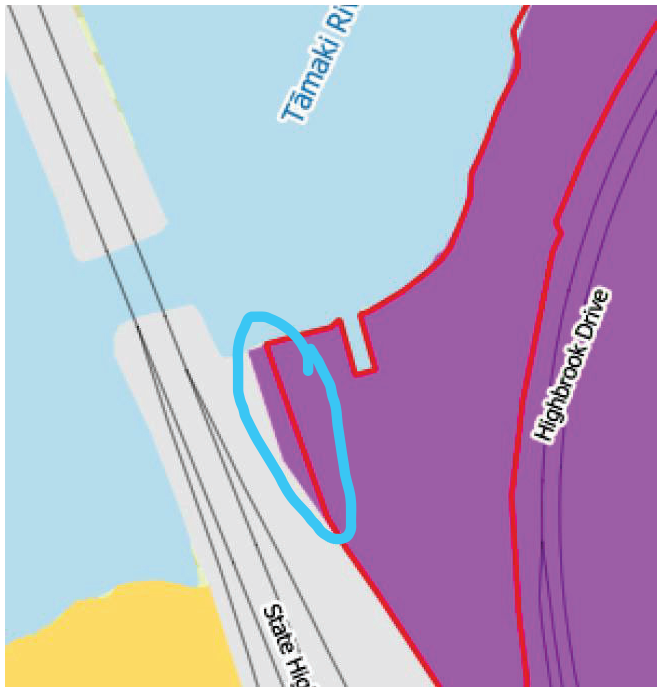
Reference	Category of information	Specific request	Reason for request
			The geographical context and location of the subject site are considered to present a disadvantage in its ability to fulfil this objective, insofar as it does not immediately adjoin any of the closest town centres or local centres, with main roads and other features creating barriers to transport connectivity. A comparison with other nearby areas zoned as THAB indicates that such zoning is more common within residential areas immediately adjoining local centres such as Otara and Otahuhu. The THAB Zone policy further refers to the need to: *ensure that residents have convenient access to services, employment, education facilities, retail and entertainment opportunities, public open space and public transport*, and also that *This will promote walkable neighbourhoods and increase the vitality of centres.* While the Integrated Management Plan ("ITA") refers to nearby employment, education and retail opportunities to the subject site, it does not fully assess their walkability and access by non-motorised modes from the subject site.
TP 2	Scope and Viability of Proposed Shuttle Bus Service	Please provide further assessment in relation to the expected travel functions and routes for a prospective shuttle bus service. Based on the expected travel market size being generated by (approximately) 200 new residential dwellings, would this be expected to sustain services	There is insufficient assessment in relation to the scope and viability of the proposed shuttle bus service and what travel markets it would be likely to cater for (e.g., employment / retail / education related trips, and during what times of the week). This information is needed to better understand the potential contribution which public transport could make towards fulfilling travel demands generated by the new

Reference	Category of information	Specific request	Reason for request
		during weekday peak hours only, or would off-peak and weekend services also be expected to be viable? Does the shuttle bus service require delivery of the full development to be commercially viable?	development. In turn, this underpins the ability of a future residential development on the site to fulfil strategic policy objectives associated with the THAB zone, such as ensuring that residents have convenient access to public transport, employment, education facilities, retail and entertainment opportunities, etc.
TP 3	Traffic Effects of SH1 Southbound / Highbrook Road / Hellaby's Road Roundabout upon Subject Site Intersection	Please provide additional assessment of potential mitigation measures to ensure that vehicular access to and from the subject site is not adversely affected by queueing from the roundabout at the motorway interchange.	The ITA forecasts peak hour queue lengths on Highbrook Drive which would extend northwards beyond the proposed site access intersection. However, it does not propose mitigation to ensure that the subject site access intersection will be able to function safely and efficiently without being adversely affected by traffic effects from the downstream motorway interchange roundabout. This information is required to confirm that safe and efficient vehicular access to and from the subject site can be achieved, which in turn underpins strategic objectives of the THAB zone, to ensure integration with adjoining land uses and efficient access to activities such as employment, education and retail opportunities and other services.
Planning, statutory and general matters – Tania Richmond, Richmond Planning Consultants			
PL 1	Consultation with Mana Whenua	Please provide an update on the Cultural Values Assessments that are being prepared by Ngati Te Ata and Ngāi Tai Ki Tāmaki.	Pages 91 – 92 refer to Ngati Te Ata and Ngāi Tai Ki Tāmaki providing Cultural Values Assessment and these documents currently in preparation.
PL 2	Road to vest and designation uplifting	Please provide the following information:	The plan change refers to the benefit of residential zoning being the vesting of land for esplanade reserve. This may

Reference	Category of information	Specific request	Reason for request
		a. If there is a timetable for the vesting of Highbrook Drive. b. What process is proposed for vesting the land for Highbrook Drive with Auckland Transport e.g. by subdivision. c. The timetable for the uplifting of the designation that applies along the western part of the site. d. The extent of the designation that may remain over the land.	also be required if a subdivision occurs as part of the vesting of Highbrook Drive. The extent of land required for the State Highway may impact on future use of the land for residential purposes and any potential mitigation/standards set out in the precinct plan (s176 of the RMA).
PL 3	National Policy Statement on Electricity Transmission	Please provide an assessment of the National Policy Statement on Electricity Transmission.	While the AUP recognises and provides for electricity transmission through the National Grid Corridor, for completeness this NPS should be addressed in section 8 of the planning report.
PL 4	Recent plan changes/section 32	Please provide an assessment of Plan Changes 78, 79 and 80 as part of the assessment of statutory documents (section 8 of the planning report).	Parts of PC78 have immediate legal effect. Objectives and policies of these plan changes require consideration as part of the assessment. This includes effects of climate change, particularly given the sites coastal location. Coastal erosion and coastal inundation are spatially identified qualifying matters applying to the plan change area.
PL 4	Regional Policy Statement/section 32	Please provide an assessment against RPS Chapters B8 Coastal Environment and B10 Environmental Risk (including PC 80 – also see above).	The plan change is required to give effect to the AUP RPS under s75 of the RMA. Chapters B8 and B10 are relevant. While the assessment required may not be as extensive as Chapters B2 and B3, the relevant provisions should be identified and assessed.

Reference	Category of information	Specific request	Reason for request
PL 5	Section 32/options	Please provide an assessment of why the proposal cannot be achieved by only a residential zoning (i.e. without a precinct plan).	The section 32 considers two zoning options but does not specifically address the benefits and costs of imposing a precinct over the plan change area to deliver the mitigation measures recommended.
PL 6	Section/options	Please comment on whether the preferred outcome of a THAB zone with a permitted activity limit of 200 units is consistent with achieving the greatest density, height and scale of development of all the residential zones.	The THAB zone has the highest intensity of all the residential zones. There is no limit on the number of units in this zone (or the Mixed Housing Urban zone).
The following comments on the precinct plan are provided in advance of the responses to the above requested information. The comments are therefore preliminary and do not incorporate the specialist comments on precinct plan provisions. The comments relate primarily to the efficiency and effectiveness of the proposed provisions.			
PL 7	14.1 Precinct Description	Please consider adding: a. The extent of area e.g. 4.4 hectares included in the precinct. b. Reference to protecting activities sensitive to noise as this is one of the precinct plan objectives.	Clarity of provisions / extent of precinct area.
PL 8	14.2 Objectives – relationship with other parts of the AUP 14.3 Policies - relationship with other parts of the AUP	Please consider moving the following text above the section to which they relate 'All relevant overlay, Auckland-wide and zone objectives apply in this precinct in addition to those specified ~~above~~ below.' 'All relevant overlay, Auckland-wide and zone policies apply in this precinct in addition to those specified ~~above~~ below.'	Consistency with other precinct plans.

Reference	Category of information	Specific request	Reason for request
PL 9	14.3 Policies	Please consider re-drafting policy 14.3(3).	The intent is understood, but it currently reads as a method rather than an outcome.
PL 10	Table 14.1.1 Activity table	Please explain the reason for difference in the activity status of (A1) and (A2).	See PL 13
PL 11	Standard 14.6.2 Highbrook Precinct Transportation Plan	Please consider redrafting as this does not read as a standard.	Rules/standards should have a measurable outcome. This standard is worded as an assessment process.
PL 12	Standard 14.6.5 Road noise attenuation 14.8.1 Matters of discretion (1) Non-compliance with Standard I4.6.5 – Road noise attenuation 14.8.2 Assessment criteria (2)	*Pending responses for the request for a site-specific acoustic assessment.*	
PL 13	14.8.2 Assessment criteria (2) Transport matters	Please refer the relevance of this criterion to activity (A1), or the activity status of (A2).	It appears this criterion is related to activity (A2), which is a discretionary activity. These are relevant matters but are unable to be addressed if the activity status is discretionary.
PL 14	14.9 Special information requirements	Please consider listed the following: a. Precinct Transportation Plan	These documents are referred to in the standards/assessment criteria.

Reference	Category of information	Specific request	Reason for request
		b. Acoustic assessment	
PL 15	14.10.1 Highbrook Precinct plan map	Please confirm a. The extent of the precinct area relates only to land zoned Business – Light Industry, or if there is a discrepancy between the survey from 2014 and the coastal boundary of the site as shown on planning maps. b. Why a portion of land along the eastern boundary with SH1 is excluded from Highbrook Precinct (indicated in blue).	It is understood from the Planning report the precinct plan only relates to land zoned Business – Light Industry however, parts of the map appear to include land within Mean High Water Spring Tide. 
PL 16	14.10.1 Highbrook Precinct plan map	Please consider the following amendments to the map: a. Indicative location of the bus stop.	To improve the linkage between the text and the diagram, and clarify parts of the map, aspects could be refined.

Reference	Category of information	Specific request	Reason for request
		b. The pedestrian barrier to be installed identified in a different colour to the extent of the precinct. c. The shared pedestrian pathway/cycleway to be upgraded identified in different colour to the other features on the map. d. The indicative (or defined) coastal boundary be shown relative to the precinct plan area. This may be assisted by showing the Tāmaki River and Ōtara Creek in blue. e. The motorway be marked.	

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP5
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link	LOCATION: East Tamaki/Otahuhu		JOB No: 21061
CO-ORDINATES mN mE	EXPOSURE TYPE: Pit	HOLE STARTED:	17/10/03
	EQUIPMENT: 12t Excavator	HOLE FINISHED:	17/10/03
R.L. m	OPERATOR: Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM	DIMENSIONS:	CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							OH	SILT, stiff, moist, light brown	M	St/VS		TOPSOIL	
					1		ML	SILT, moist, stiff to very stiff, light brown, some white pumiceous pebbles up to medium gravel sized. Metal pipes, wood.				FILL (including, construction debris)	
					2		GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown.	W	TP		Crushed aggregate FILL	
							ML	SILT, stiff, moist, moderately plastic, light brown with orangey brown mottles.	M	St		ALLUVIUM (PUKETOKA FORMATION)	
					3			**END OF TEST PIT AT 3m**					

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

NZGD ID: TP_113113

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP6
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link	LOCATION: East Tamaki/Otahuhu		JOB No: 21061
CO-ORDINATES mN / mE	EXPOSURE TYPE: Pit	HOLE STARTED:	17/10/03
	EQUIPMENT: 12t Excavator	HOLE FINISHED:	17/10/03
R.L. m	OPERATOR: Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM	DIMENSIONS:	CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown.	W	TP		Engineered compacted crushed aggregate FILL	
							MH	SILT, very stiff, moist, light orangey grey with orangey brown mottles.	M	VSt		ALLUVIUM (PUKETOKA FORMATION)	
					1			**END OF TEST PIT AT 1m**					
					2								
					3								

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP7
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT:	Waiouru Peninsula to SH1 Link	LOCATION:	East Tamaki/Otahuhu	JOB No:	21061
CO-ORDINATES	mN mE	EXPOSURE TYPE:	Pit	HOLE STARTED:	17/10/03
		EQUIPMENT:	12t Excavator	HOLE FINISHED:	17/10/03
R.L.	m	OPERATOR:	Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM		DIMENSIONS:		CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown.	W	TP		Engineered compacted crushed aggregate FILL	
							CH	CLAY, stiff, wet, highly plastic, light grey.		St		ALLUVIUM (PUKETOKA FORMATION)	
					1			**END OF TEST PIT AT 1m**					
					2								
					3								

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP8
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link | LOCATION: East Tamaki/Otahuhu | JOB No: 21061

CO-ORDINATES mN / mE | EXPOSURE TYPE: Pit | HOLE STARTED: 17/10/03
EQUIPMENT: 12t Excavator | HOLE FINISHED: 17/10/03
R.L. m | OPERATOR: Lee - Contract Landscapes | LOGGED BY: D.L.R
DATUM | DIMENSIONS: | CHECKED BY:

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown. Filter cloth at base.	W	TP		Engineered compacted crushed aggregate FILL	
					1		CH	CLAY, stiff, moist, highly plastic, dark grey with minor shiny speckles.	M	St		ALLUVIUM (PUKETOKA FORMATION)	
								END OF TEST PIT AT 1.5m					
					2								
					3								

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

NZGD ID: TP_113116

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP9
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link	LOCATION: East Tamaki/Otahuhu		JOB No: 21061
CO-ORDINATES mN / mE	EXPOSURE TYPE: Pit	HOLE STARTED:	17/10/03
	EQUIPMENT: 12t Excavator	HOLE FINISHED:	17/10/03
R.L. m	OPERATOR: Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM	DIMENSIONS:	CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown. Filter cloth at base. Water flowing at base.	W	TP		Engineered compacted crushed aggregate FILL	
		▼			1		MH	SILT, very stiff, wet, dark grey.		VSt		ALLUVIUM (PUKETOKA FORMATION)	
								END OF TEST PIT AT 1.5m					
					2								
					3								

SKETCH

675

NZGD ID: TP_113117

TP10

No photo

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP10
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link	LOCATION: East Tamaki/Otahuhu		JOB No: 21061
CO-ORDINATES mN / mE	EXPOSURE TYPE: Pit	HOLE STARTED:	17/10/03
	EQUIPMENT: 12t Excavator	HOLE FINISHED:	17/10/03
R.L. m	OPERATOR: Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM	DIMENSIONS:	CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
					0		GW	Fine to medium GRAVEL with some coarse sand, wet, tightly packed, dark brown. Filter cloth at 0.5m. Water flowing at base.	W	TP		Engineered compacted crushed aggregate FILL	
					1		MH	SILT, very stiff, wet, dark grey.		VSt		ALLUVIUM (PUKETOKA FORMATION)	
								END OF TEST PIT AT 1.5m					
					2								
					3								

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP12
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT:	Waiouru Peninsula to SH1 Link	LOCATION:	East Tamaki/Otahuhu	JOB No:	21061
CO-ORDINATES	mN mE	EXPOSURE TYPE:	Pit	HOLE STARTED:	17/10/03
		EQUIPMENT:	12t Excavator	HOLE FINISHED:	17/10/03
R.L.	m	OPERATOR:	Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM		DIMENSIONS:		CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION							GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE		UNIT
							OL	SILT, very stiff, wet, dark brown, roots.	W	VSt		TOPSOIL		
			• 145/65kPa				ML	SILT, very stiff, wet, dark brown, trees and branches, basalt boulders, rootlets, water seeping.				FILL		
					1		ML	SILT, very stiff, moist, dark brown.	M			TOPSOIL/FILL		
			• 170/46kPa				ML	SILT, very stiff, moderate plasticity, light grey with orangey brown mottles.				ALLUVIUM (PUKETOKA FORMATION)		
			• 178/61kPa		2									
					3			**END OF TEST PIT AT 2.5m**						

SKETCH

EXCAVLOG 21061.003T.GPJ 04/12/03

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP13
Location: Refer to Site Plan
SHEET 1 OF 1

PROJECT: Waiouru Peninsula to SH1 Link	LOCATION: East Tamaki/Otahuhu		JOB No: 21061
CO-ORDINATES mN / mE	EXPOSURE TYPE: Pit	HOLE STARTED:	17/10/03
	EQUIPMENT: 12t Excavator	HOLE FINISHED:	17/10/03
R.L. m	OPERATOR: Lee - Contract Landscapes	LOGGED BY:	D.L.R
DATUM	DIMENSIONS:	CHECKED BY:	

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							OL	SILT, very stiff, moist, dark brown roots.	M	St		TOPSOIL	
							ML	SILT, moist, stiff, dark brown to orangey brown, wood, rootlets.				FILL	
			• 74/15kPa										
			• 104/37kPa		1			-200mm thick, white, pumiceous layer.					
		▼						-water seeping.					
			• 92/41kPa				OL	SILT, stiff, wet, dark brown, black, rootlets.	W			TOPSOIL	
							ML	SILT, very stiff, moist, moderate plasticity, light grey with orangey brown mottles.	M	VSt		ALLUVIUM (PUKETOKA FORMATION)	
			• 148/41kPa		2								
			• 133/7kPa										
					3			**END OF TEST PIT 2.5m**					

SKETCH

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP14
Location: Refer to Site Plan
SHEET 1 OF 1

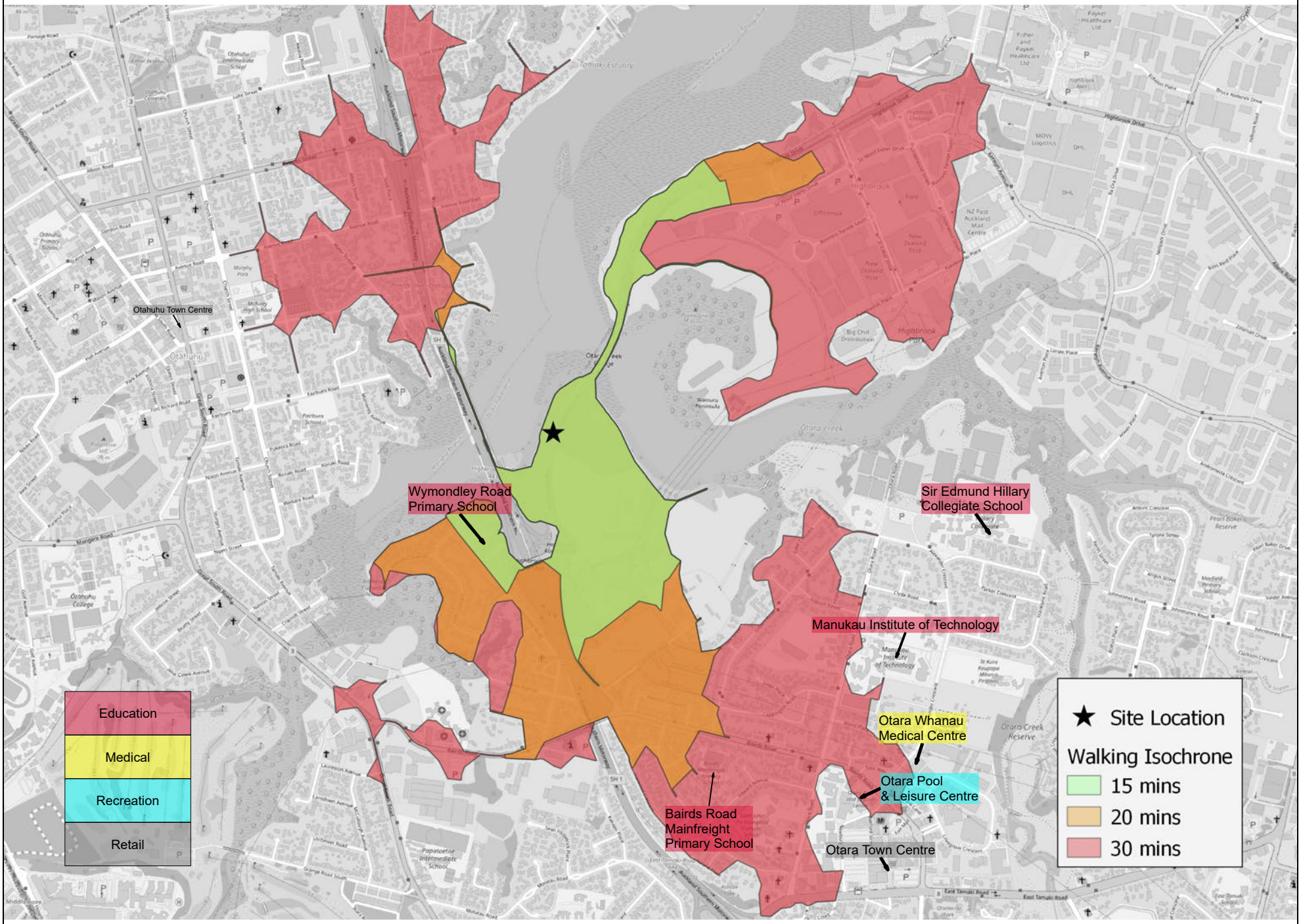
PROJECT: Waiouru Peninsula to SH1 Link | LOCATION: East Tamaki/Otahuhu | JOB No: 21061

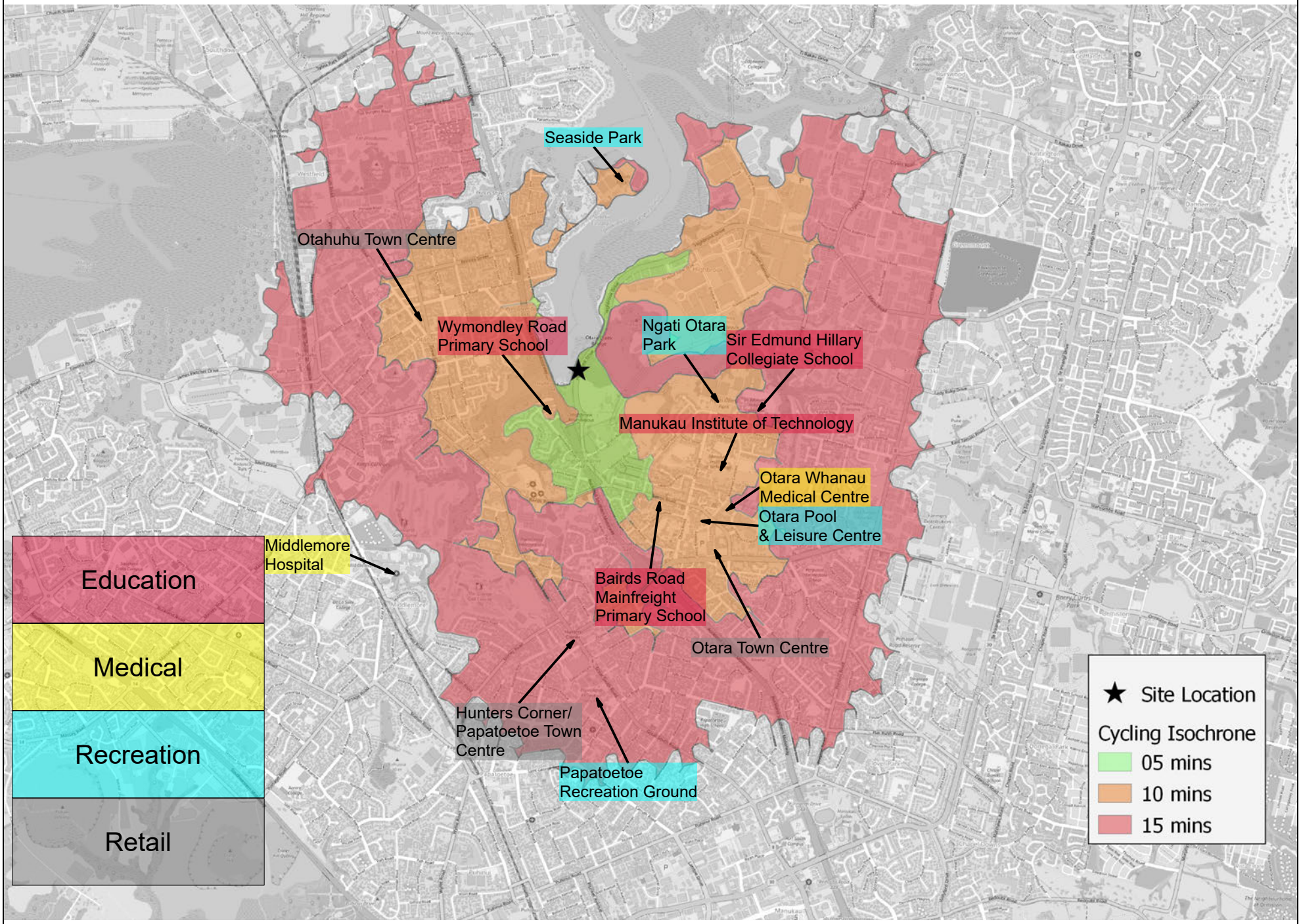
CO-ORDINATES mN / mE | EXPOSURE TYPE: Pit | HOLE STARTED: 17/10/03
EQUIPMENT: 12t Excavator | HOLE FINISHED: 17/10/03
R.L. m | OPERATOR: Lee - Contract Landscapes | LOGGED BY: D.L.R
DATUM | DIMENSIONS: | CHECKED BY:

EXCAVATION TESTS						ENGINEERING DESCRIPTION					GEOLOGICAL	
PENETRATION 1 2 3	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH 10 25 50 100 200	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
							OL	SILT, stiff, moist, dark brown, roots.	M	St		TOPSOIL	
							ML	SILT, stiff, wet, dark brown with white pumiceous layer 0.3m-0.4m, wood, rootlets.	W			FILL	
			•62/12kPa		1		ML	SILT, firm to stiff, wet, dark grey, shell layer at 1.0m.		F/St			
								END OF TEST PIT AT 1.5m					
					2								
					3								

SKETCH

NZGD ID: TP_113122


Otahuhu Town Centre
Wymondley Road Primary School
Sir Edmund Hillary Collegiate School
Manukau Institute of Technology
Otara Whanau Medical Centre
Otara Pool & Leisure Centre
Bairds Road Mainfreight Primary School
Otara Town Centre
Education
Medical
Recreation
Retail
Site Location
Walking Isochrone
15 mins
20 mins
30 mins


Seaside Park
Otahuhu Town Centre
Wymondley Road Primary School
Ngati Otara Park
Sir Edmund Hillary Collegiate School
Manukau Institute of Technology
Otara Whanau Medical Centre
Otara Pool & Leisure Centre
Middlemore Hospital
Bairds Road Mainfreight Primary School
Otara Town Centre
Hunters Corner/ Papatoetoe Town Centre
Papatoetoe Recreation Ground
Education
Medical
Recreation
Retail
Site Location
Cycling Isochrone
05 mins
10 mins
15 mins

Pages 686-708 redacted as per s42 order. Refer to direction 3 for more information.

Highbrook

October 6, 2021

1:5,000

0 0.03 0.07 0.13 mi

0 0.05 0.1 0.2 km

Auckland noise barriers (2011)

Roads

Regional and arterial

State highway

Noise contour areas

55 - 59 dB LAeq (24hr)

60 - 64 dB LAeq (24hr)

65 - 69 dB LAeq (24hr)

>70 dB LAeq (24hr)

Noise contour lines

Stormwater Management Plan Highbrook Private Plan Change Request – Ver. 1.2

Final

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Document control

Purpose

Purpose	To support the Highbrook Private Plan Change Request application

Document

Document Name	Stormwater Management Plan – Highbrook Private Plan Change Request

Approval

Author of the Stormwater Management Plan: Suman Khareedi, Jono Ryan & Michael Barker		
Reviewed	Sukhi Singh	Date:29/11/22
Approved	Sukhi Singh	Date: 29/11/22

Table of contents

Executive summary

The overall purpose of the Stormwater Management Plan (SMP) is to provide guidance to the applicant and Auckland Council on how stormwater will be managed based on a developed future land use scenario, and to support the Private Plan Change Request application.

This SMP is consistent with Council's policies and plans. Non-statutory policy and planning documents are also considered.

This Stormwater Management Plan (SMP) has been prepared to support the Highbrook Private Plan Change Request. The Plan Change area is part of the site at 8 Sparky Road, Ōtara, which was the site of the former Ōtāhuhu Power Station.

The purpose of the Plan Change is to enable the change in the use of the site from Light Industry Zone to Terrace House and Apartments Zone (THAB). The residential use of the site enables efficient use of the land resource in a strategic location, that has a high level of visual amenity offered by the Tāmaki Estuary environments.

The scope of the SMP:

The scope of this SMP is to:

- Detail proposed stormwater management for development of the plan change area.
- Demonstrate how stormwater management related expectations under the Auckland Unitary Plan (AUP) and Auckland Council's Stormwater Network Discharge Consent can be met.

Outcomes of the SMP:

The outcomes sought by the SMP are:

- An integrated stormwater management approach.
- A water sensitive treatment framework that manages and mitigates the impact of land use change from industrial to residential use.
- Provide for the enhancement of the Tāmaki Estuary environments.
- Identify flood risk areas and ensure that development is located or appropriately managed within these areas.
- A set of Best Practice Options (BPO) for stormwater that can be applied to the development.

Network Discharge Consent (NDC)

Auckland Council obtained a Region-wide Network Discharge Consent to authorise the diversion and discharge of stormwater. The area covered by the NDC includes all urban zoned land. The preparation of a SMP is a direct requirement of the NDC for any activity seeking to utilise or fall within the parameters of the NDC by having the SMP "adopted" into the NDC framework. In relation to this Private Plan Change Request, the NDC requires that a SMP only be adopted if a SMP has been prepared to support the plan change and the plan change must be consistent with that SMP (condition 13b). This SMP has been prepared to support the Private Plan Change Request for the rezoning of part of the site located at 8 Sparky Road, Ōtara. This revision of the SMP is not prepared for adoption into the NDC. This SMP will be revised for adoption at the Resource Consenting stage of the project when specific design details are available.

The Plan Change Request seeks to rezone the site from Light Industry Zone to THAB Zone. The future development of the site will be required to align with the objectives, policies, and rules framework of the THAB Zone.

The Development Concept Plan to illustrate one option for the future development of the site, aligning with the outcomes envisaged by the THAB Zone. The Development Concept Plan envisages approximately 500 houses on the site, based on an apartment typology.

A new stormwater management system will replace the current stormwater management system on site comprising of table drains, a 300 mm stormwater culvert, and a catchpit. The new stormwater system will be a piped stormwater reticulation system with suitable stormwater treatment devices that comply with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. A detailed design of this stormwater management system will be developed in the future to support the Resource Consent application. Once implemented, this new stormwater management system will service all buildings, impervious areas, and some previous areas. The remainder of the pervious areas (less than 30% of the total site) viz., the area of the future esplanade reserve, will remain 'unconnected' thereby draining directly to the Tāmaki River.

The proposal is to treat stormwater from the entire site using new treatment devices that are designed to comply with GD01/TP10. The existing stormwater pond that treats runoff from a small area (0.9ha) of Highbrook Drive (refer to Figure 1) will need to be decommissioned to enable development within this portion of the site. To enable decommissioning this pond, the proposal is to combine the treatment of runoff from the subject section of Highbrook Drive with that from the site in device(s) to be constructed. Once vested in Auckland Council, this will reduce the operation and maintenance requirements for one treatment pond.

The proposed development plan and the topography of the site allows for the following four options for stormwater treatment:

1. A wetland (or a coastal wetland) constructed in conjunction with the creation of the esplanade reserve along the banks of the Tāmaki estuary.

2. Two stormwater treatment ponds at both ends of the site to treat approximately half the site in each pond.
3. Proprietary treatment devices (viz., Stormfilters) at both ends of the site to treat approximately half the site in each device.
4. Raingardens constructed along the proposed road.

Raingardens (Option 4) are not preferred, owing to operation and maintenance requirements and Auckland Transport's preference to not have them in the road corridor. Therefore, options 1, 2 and 3 are recommended for this site. A suitable option will be selected from the remaining three options during the development stage for design and implementation.

This new stormwater system will be a piped stormwater reticulation system that complies with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. As such, the network will have adequate capacity to convey 10% AEP event flows. The overland flows will be along the roads to be formed. No secondary flow structures viz., culverts are deemed necessary.

This site or the properties along the banks of Tāmaki Estuary downstream of the site, are neither flood prone nor flood sensitive. Only a small portion of the site in the vicinity of the barge dock (on the western side of the site) and the northern tip of the site that are at RL 2.0 m are expected to get inundated by 0.34 m during a 1% AEP event. The future development of the site will be carefully designed to ensure that habitable floors are not proposed in the section of the site that is flood prone or flood sensitive.

The future road network for this site can be aligned with the existing gravel roads. As such the overland flow paths within the site remain largely unchanged after the development.

The pipe network to service the site will be independent of the existing Auckland Council's stormwater network because of the site's location in relation to existing Auckland Council stormwater network. Stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. As such, the hydraulic connectivity will be directly to the Tāmaki Estuary flows. The time of concentration (ToC) for the flows from the site will be significantly less than the ToC for the flows in Tāmaki Estuary or the Ōtara Creek in the vicinity of the site.

The proposal is to vest the entire stormwater management system to be developed for this site, in Auckland Council. The future asset ownership will be with Auckland Council.

No bespoke operation and maintenance requirements are envisaged for the stormwater management system proposed for this site. They will be consistent with the operation and maintenance requirements of the wider Auckland Council stormwater network.

The principles outlined for the proposed stormwater management system is consistent with the objectives of the NDC. The proposed stormwater management system meets the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent

(NDC) that the Auckland Council holds. There are no departures from the Auckland Council Code of Practice or the connection requirements of the NDC.

Changing the zoning from Light Industry to THAB will have a lesser impact on the environment from the perspective of stormwater management. Under the AUP(OP), the maximum permissible impervious area in the THAB Zone is less than that in the Light Industry Zone. This will result in reduced stormwater runoff volume and peak flows into the receiving environment. Rezoning the land as proposed will not result in any material difference in water quality, as in both cases, runoff will need to be treated to comply with the guidelines in GD01/TP10 and conditions of the Network Discharge Consent (NDC).

Establishing a combined treatment facility for the site and subject section of Highbrook Drive (currently being treated in a separate pond), will reduce maintenance requirements for Auckland Council. The opportunity to create wetland along the bank of the Tamaki Estuary will result in high level of amenity for the public, similar to the stormwater treatment facilities in the Highbrook Business Park further north along Highbrook Drive.

Rezoning as proposed has the potential for improvements both in the short term (establishment of an Esplanade Reserve area) and the long term (residential amenity). Establishment of an Esplanade Reserve in the future will provide public access and amenity, with ongoing maintenance of the coastal vegetation. In addition, residential development offers greater opportunities for planting, maintenance and enhancement of the main part of the site, as well as the coastal area.

1 Existing site appraisal

1.1 Summary of data sources and dates

Existing site appraisal item	Source and date of data used
Topography	• Auckland Council GeoMaps
Geotechnical / soil conditions	• Babbage Geotechnical Appraisal Memo of 17 February 2022 prepared by Jordan Moll
Existing stormwater network	• Auckland Council GeoMaps and site inspection
Existing hydrological features	• Auckland Council GeoMaps and site inspection
Stream, river, coastal erosion	• Site inspection, Geotechnical appraisal
Flooding and flowpaths	• Auckland Council GeoMaps and site inspection
Coastal Inundation	• Auckland's Exposure to Coastal Inundation by storm-tides and Waves Technical Report 2020/024
Ecological / environmental areas	• Desktop Ecological Assessment Memo by Bioresearches dated 19 July 2022 prepared by Treffery Barnett
Cultural and heritage sites	• No sites identified in the AUP(OP)
Contaminated land	• Preliminary Contamination Review by Babbage Consultants Ltd dated 15 July 2022 prepared by Tiago Teixeira.

1.2 Location and general information

The land subject to the Private Plan Change Request ("the site") is the part of 8 Sparky Road, Ōtara (shown in Figure 1) with a parcel ID 7534518. The site forms part of the former Ōtāhuhu Power Station site (closed in 2015). It is bound by Highbrook Drive to the south-east, Tāmaki Estuary to the north, Ōtara Creek to the Northeast, and State Highway 1 (SH1) to the west.

The site is currently zoned Light Industry. The proposal is to change the zoning to Terrace House and Apartments Zone (THAB). Figure 1, below, shows the area subject to the Plan Change Request. A plan of the existing site is also included in Appendix A1.

Figure 1: Location of plan change area (the Site)

Existing site element	
Site address	• 8 Sparky Road, Ōtara
Legal description	• Lot 2 DP 209362
Current Land Use	• Vacant. A part of site adjoining Highbrook Drive is occupied by a small stormwater pond.
Current building coverage	• N/A
Historical Land Use	• Former Ōtāhuhu Power Station

The site is approximately 4.4ha and comprises vacant land with predominantly bush and grass cover. Some additional features at, and adjacent to, the site include (refer to figure 2, below):

1. Barge dock at the south end of the site. This was used for materials supply to support the construction of the former Ōtāhuhu Power Station.
2. Stormwater treatment pond towards the northern end of the site, adjacent Highbrook Drive. This pond treats stormwater runoff generated by a portion (approximately 0.9ha) of Highbrook Drive.

3. Boat ramp, at the northeast end of the site.
4. Gravel access road along the length of the site, running parallel to Highbrook Drive.
5. Concrete box culvert (4m x 2.4m) below Highbrook Drive at the north end of the site to allow vehicle access between the east and west sides of Highbrook Drive. This access has been blocked off with a fence and gate.
6. A Weir across Ōtara Creek, built as part of the Otahuhu Power Station to dam flows from Ōtara Creek to allow intake of water for cooling of the power station (figure 3).
7. Water cooling pond, where discharge of hot water from the former power station would cool down before discharging to Tamaki River. This pond has partly backfilled. The reminder of the pond is currently being used as a sediment control pond.
8. 1800mm diameter outfall pipeline between the water-cooling pond and Tamaki River. This pipeline runs across the north end of the subject site. This outfall pipe discharges into the Tamaki Estuary via three lines of diffusers identified by the markers.

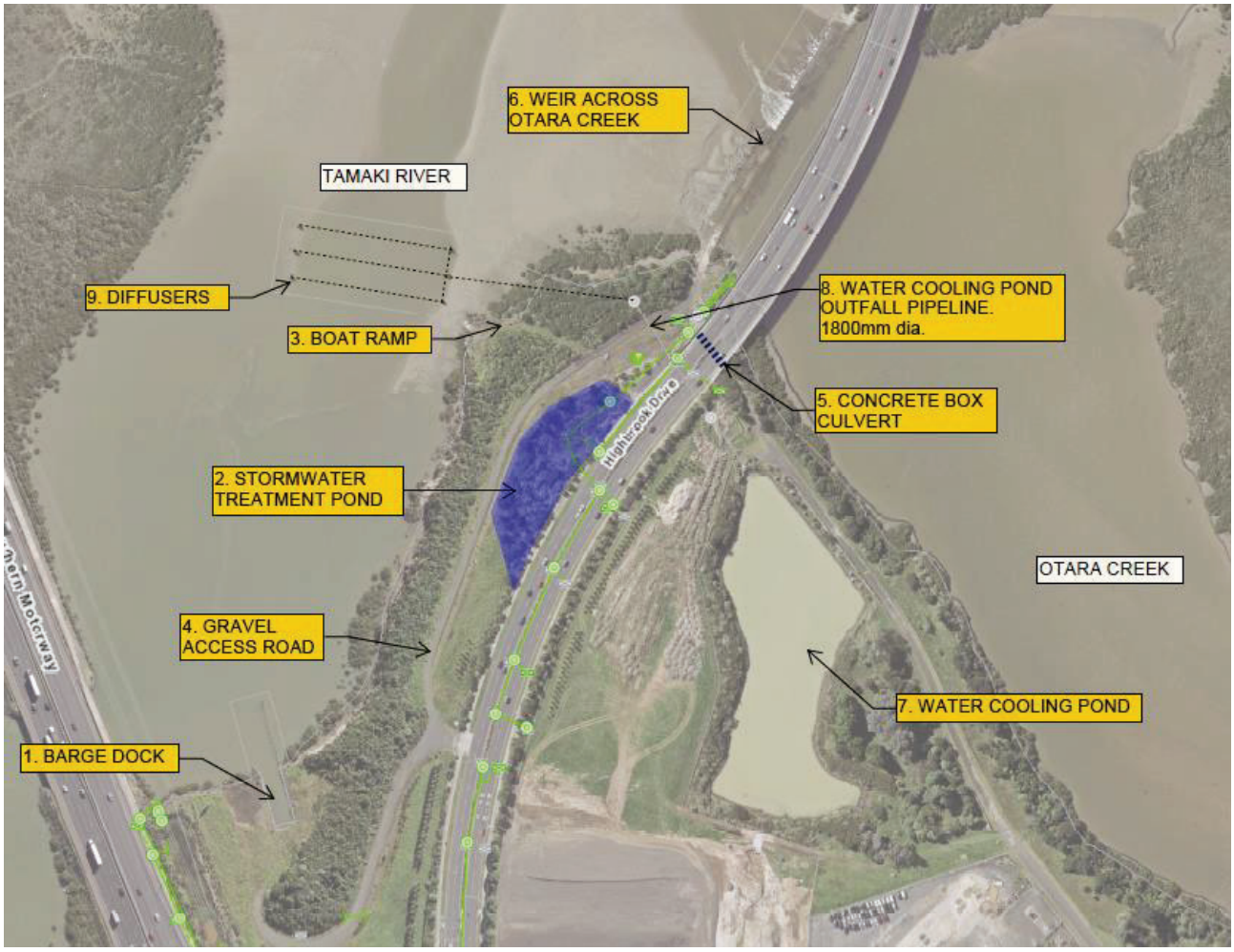


Figure 2: Existing Site Features

Figure 3: Existing Weir across Ōtara Creek

Figure 4: Reminder of the water cooling pond being used as a sediment control pond

1.3 Topography

The site generally falls from Highbrook Drive to the Tāmaki Estuary (north-westward direction) with the north end of the site falling to Ōtara Creek (north-eastward). The highest point of the site (RL 9.5 m) is in the south-eastern corner of the site. The topography of the site comprises of three distinct terraces. The first terrace is along the eastern boundary of the site (RL 8.0-9.5 m). The second terrace is a 25-30 m strip of land along the gravel road at an RL of 7.5-8.0 m. The third terrace is in the south-western corner of the site at an RL of 2.0-3.0 m in the vicinity of the barge dock.

1.4 Geotechnical

The geological map (see figure 5) indicates the south and centre of the site is underlain by pumiceous deposits of the Puketoka Formation (tp), described light-grey to orange-brown, pumiceous mud, sand and gravel, with muddy peat and lignite. The north part of the site is underlain by Lithic tuff of the Auckland Volcanic Field (avt), being thin graded beds of grey, mud- to sand-sized fragments of comminuted, country rock (mainly sandstone, mudstone, alluvium, micaceous sand) together with basalt and basanite fragments.

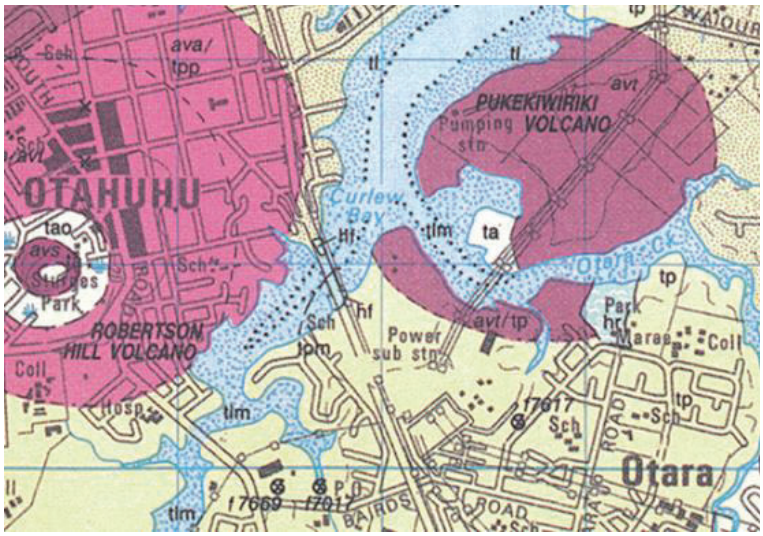


Figure 5: Geological Map

The desk study completed by Babbage, using details of historic investigations carried out close to the site, identifies the ground conditions to comprise of clay, silt, and sand of the Puketoka formation, overlain in part by tuff and other AVF deposits and/or surficial fill. The Puketoka formation is anticipated to comprised mostly stiff to hard silt over the top 8-15m with some loose to dense silty sand lenses. Competent Kaawa Formation sedimentary rock is expected between 15 m and 22 m below ground level.

Figure 6: Slope and condition along the bank of Tamaki River estuary

The northern most part of the site was reclaimed in the 1960s. In the late 1960s and 1970s an area in the southwestern corner of the site, adjacent to Tāmaki Estuary, was reclaimed. The source of the fill is unknown. Nonetheless, it appears to comprise of approximately 1.0m of well compacted aggregate separated from the underlying alluvium by a geotextile.

In the early 2000s significant earthworks were undertaken in the southern and eastern part of the site, and the land to the south and east, for the construction of Highbrook Drive. Large amounts of fill material were stockpiled in this area.

The site slopes gently down to the Tamaki River estuary along the western and northern boundaries with a thick vegetation and mangroves along the coastline. As such, the site is not considered to be susceptible to slope stability issues or coastal erosion.

1.5 Existing drainage features and stormwater infrastructure

The site is vacant land. The drainage/stormwater infrastructure currently present on site comprises the following (refer to figure 7, below):

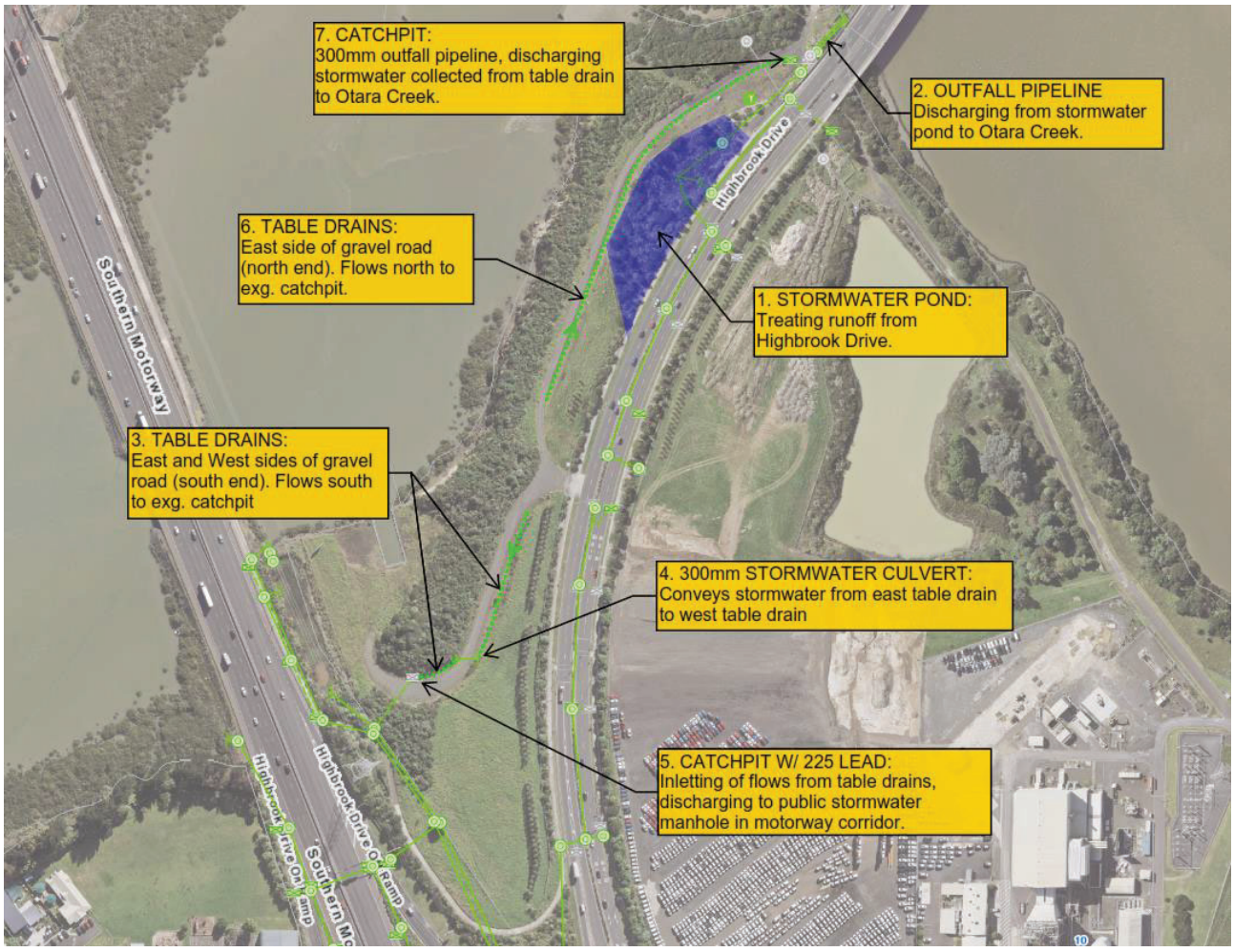


Figure 7: Existing drainage features & stormwater infrastructure

1. A stormwater pond that treats runoff from a 0.9 ha section of Highbrook Drive
2. Outfall pipeline from the stormwater pond that discharges to Ōtara Creek estuary
3. Table drains on either side of the gravel road (south end), flowing south to existing catchpit.
4. A 300 mm stormwater culvert across the gravel road that conveys stormwater from the eastern table drain to the western table drain (figure 8).
5. A catchpit and a 225 mm diameter lead connecting the discharge from the table drain (south end) to the existing manhole 2000058569 in the motorway corridor.
6. Table drains on the east side of the gravel road (north end), flowing north to existing catchpit.
7. A catchpit and 300 mm outfall pipeline, discharging to Ōtara Creek estuary.
8. 1800 mm outfall pipeline from the water cooling pond, traversing northeast across the site (refer to figure 2).

Figure 8: 300mm culvert across the internal gravel road

1.6 Receiving environment

The receiving environment for the site is the Tāmaki Estuary which forms part of the Hauraki Gulf catchment area (refer Figure 8.5.3.1 of the Regional Policy Statement in the AUP(OP)). Figure B7.4.2.1 of the AUP(OP) identifies the Tāmaki Estuary as a marine degraded area in Auckland (Degraded Area 1).

The receiving environment includes the Significant Ecological Areas (SEA) shown in Figure 9 below. The AUP(OP) describes these SEAs as:

- **SEA-M2-45w2** – Wading bird habitat. Extensive areas of feeding habitat for waders along this coastline. The whole of the Tamaki Estuary is a regionally important wildlife habitat and has been selected by the Department of Conservation as an Area of Significant Conservation Value (ASCV).
- **SEA-M2-45c** – Otahuhu Creek. Extensive areas of feeding habitat for waders along this coastline. SEA-M2

Figure 9: Extent of Significant Ecological Area

Both of the SEAs described above are either upstream of the site or located on the far bank of Tāmaki Estuary (opposite side of the subject site). There are no SEA areas delineated in the AUP along the banks of Tāmaki Estuary bordering the site.

There are no Natural Resources overlays applied over the site in the AUP(OP).

1.7 Existing hydrological features

The only hydrological feature on the site is the stormwater treatment pond that treats runoff from approximately 0.9 ha section of Highbrook Drive. It occupies an area of approximately 3,000 m^2 in the north-eastern corner of the site with an estimated storage volume of approximately 300 m^3.

1.8 Flooding and Overland Flow Paths

Auckland Council, based on rapid flood modelling, has identified three overland flow paths through the site. These are shown in in Figure 10. Our site inspection has identified that there are no overland flow paths entering the site from neighbouring land. There are two overland flow paths that start within the site. They are:

1. The overland flow path along the table drains of the gravel road.

2. The overland flow path in the southern part of the site that drains to the NZTA stormwater pond.

The major overland flow path shown to run into the site at the northern end from Highbrook Drive from the water-cooling pond to the east of Highbrook Drive does not flow across the Tamaki Drive into the site as shown in the Auckland Council GeoMaps. The pond outlet structure has a flood gate (Figure 11) that allows discharge of secondary overland flows (or flows in excess pond discharge rate) directly to Tamaki Estuary though the 1800mm outfall pipeline.

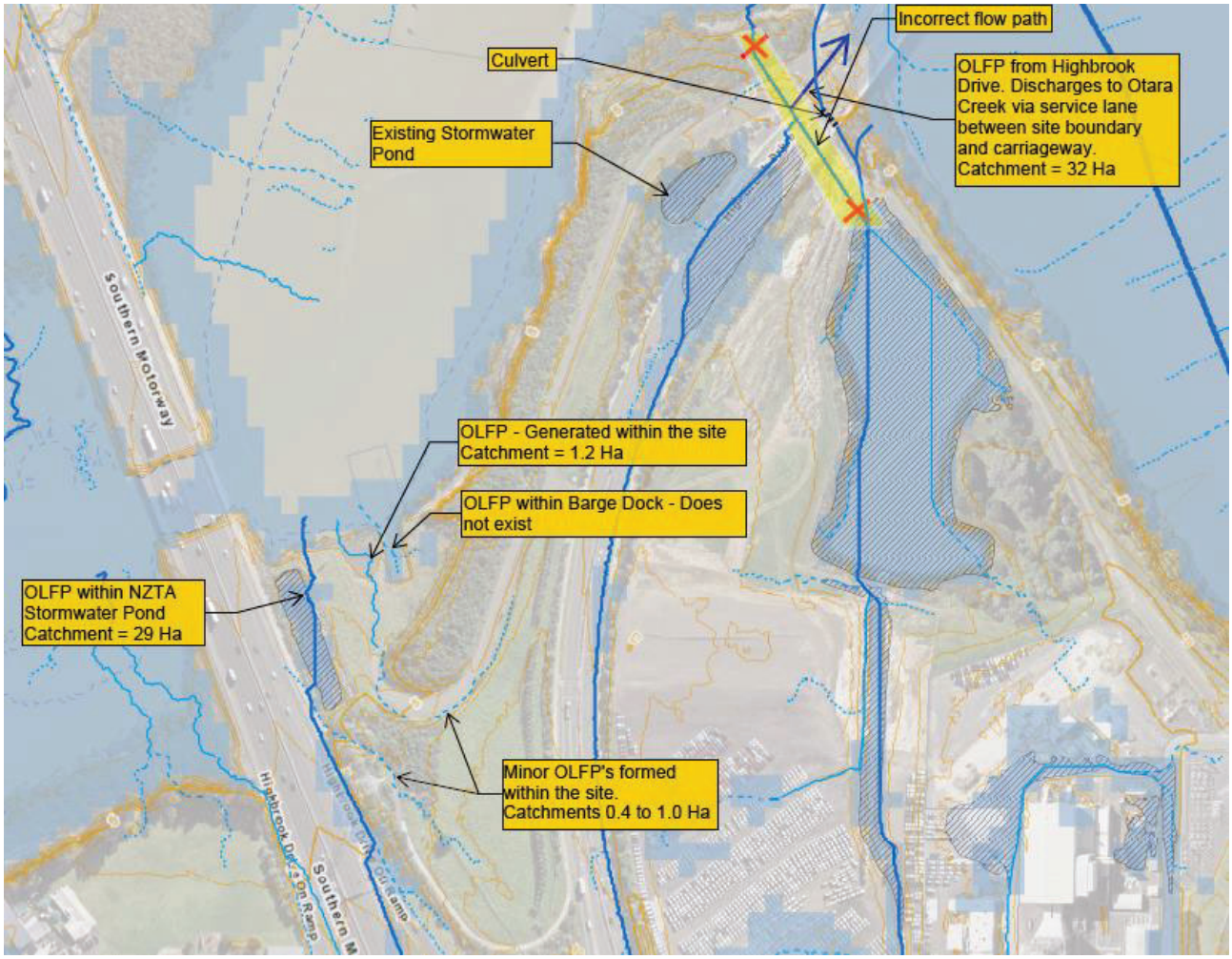


Figure 10: Overland flow paths through the site

Once the pond is fully reclaimed, the overland flows are likely to flow through the box culvert underpass via an access track next to the pond discharging to the Ōtara Creek upstream of the weir (as shown in Figure 10). As such this overland flow path does not enter the site now are in the future.

Figure 11: Floodgate at the water-cooling pond outlet

1.9 Coastal inundation

The west boundary of the site is contiguous with the banks of the Tamaki River. The Auckland Council Technical Report 2020/024: *Auckland's Exposure to Coastal Inundation by Storm-tides and Waves* has calculated coastal inundation levels at two locations near the site. Table 1, below, summarises these results.

Table 1: Coastal Inundation Levels (*Auckland Council TR 2020/024*)

Site	0.01 AEP max. storm-tide plus wave set up elevations	0.01 AEP max. storm-tide plus wave setup elevations, with inferred wave setup component subtracted
Tāmaki Estuary at the mouth of Pakuranga Creek (downstream of the site)	RL 2.42m	RL 2.32m
Tāmaki Estuary near Lansdown Avenue (Upstream of the site)	RL 2.46m	RL 2.36m

By linear interpolation, the 1% AEP (0.01 AEP) maximum storm-tide plus wave setup elevation with inferred wave setup component subtracted at the site is estimated to be RL 2.34 m. This results in a small portion of the site in the vicinity of the barge dock and the northern tip of the site that is at RL 2.0 m gets inundated by up to 340 mm (0.34 m) during a 1% AEP event. Therefore, the future habitable floor levels of buildings within this part of the site need to be higher than RL 3.34 m. As per the Development Concept Plan, for the site, the habitable floors are expected to be along the eastern, southern and south-western boundary of the site where the general ground level is substantially above RL 3-8 m. The details pertaining to the finished ground levels of buildings will be refined at the time of applying for Resource Consents.

Figure 12: Extent of coastal inundation.

1.10 Biodiversity

Historic aerials (Auckland Council GeoMaps, Retrolense) illustrate that the site was cleared of all vegetation for farming except for a small amount of coastal fringe vegetation (1940, 1959, 1960). The site was further modified with the addition (1967) and removal (between 2001 and 2003) of power generation plant and access roads. This was followed by the construction of Highbrook Drive (2006) and subsequent landscape planting.

The vegetation on the site is currently a mix of rank grass, native plantings (flax, five finger, pōhutukawa, cabbage tree, kānuka), exotic trees (macrocarpa, poplar, pine) and exotic weed species (tree privet, pampas, wattle), transitioning to mangroves in the Coastal Marine Area (CMA). Although the area of native plantings near the coast are now well established, they are comprised of common native species, and area strongly influenced by weed species.

1.11 Cultural and heritage sites

The Auckland Council GeoMaps does not identify any cultural and heritage sites being present within the site.

1.12 Contaminated land

The site and surrounding area were pastureland until the part of the site and land to the southeast was developed for the Ōtāhuhu Power Station in the late 1960s. Two large circular tanks, in a large rectangular earth bund, associated with the power station were installed across the southeast boundary in 1967. In the late 1960s and 1970s, an area in the southwestern corner of the site, adjacent to the Tamaki River, was reclaimed. The source of the fill is unknown. A barge dock and long jetty stretching into the Tamaki River were constructed in this reclaimed area by 1979. A rectangular feature was present in the southwestern corner of the site in 1979/1980 but had been removed by 1988. The two circular tanks had been removed by the early 2000s at which time significant earthworks were undertaken in the southern and eastern part of the site and the land to the south and east, for the construction of Highbrook Drive.

The northern part of the site appears to have been used as a construction yard during this time. The road construction works were completed by 2010. There has been no significant changes at the site since 2010. It is possible that contaminated soil may be present in various locations at the site as a result of historical activities at the site and in the surrounding area. A detailed plan showing the historical activities included in Appendix A2.

2 Development summary and planning context

2.1 Proposed Development

The Plan Change Request seeks to rezone the site from Light Industry Zone to THAB Zone. The future development of the site will be required to align with the objectives, policies and rules framework of the THAB Zone.

The applicant has prepared a Development Concept Plan to illustrate one option for the future development of the site, aligning with the outcomes envisaged by the THAB Zone. The Development Concept Plan envisages approximately 500 houses on the site, based on an apartment typology. It is noted that development beyond 200 houses will need to be supported by a future Integrated Transport Assessment.

Future development of the site will require the vesting of esplanade reserve areas adjoining Tāmaki Estuary.

Figure 13: Concept Plan of the proposed development

2.2 Location and area

The site is a 4 ha (inclusive of the stormwater pond) part of 8 Sparky Road, Ōtara (shown in Figure 1) with a parcel ID 7534518. It forms a part of the former Ōtāhuhu power station site bound by Highbrook Drive to the south-east, Tāmaki Estuary to the north, Ōtara Creek Estuary to the Northeast, and the Southern Motorway to the west.

2.3 Earthworks

Detailed development design plans will be confirmed in the future at the time of lodging of the resource consent application, which will include the volume and area of the site to be

earth worked. Development of the site will require a main spine road to be formed and building platforms will be created to compliment the topography of the site.

2.4 Regulatory and design requirements

Requirement	Relevant regulatory / design to follow
Unitary Plan – SMAF hydrology mitigation	• The site is not subject to the SMAF overlay
High Contaminant Generating Areas	• Chapter E9 of the AUP(OP) will be relevant at the land development stage, given that residential development generally utilises car parks and manoeuvring areas that are likely to meet the threshold for this activity. The provisions of Chapter E9 and relevant policies of Chapter E1 (Water quality and integrated management) are noted and utilised in BPO for stormwater management.
Natural Hazards	• Chapter E36 of the AUP(OP) sets out the provisions relating to natural hazards and flooding. Auckland Council's GeoMaps (Figure 14) indicates overland flow paths, the 1 percent annual exceedance probability (AEP) floodplain, and the coastal storm inundation 1 per cent AEP area are present within the site. The provisions of Chapter E36 are used to inform the BPO for stormwater management.
Auckland Unitary Plan Precinct	• N/A
Existing Catchment Management Plan	• The Auckland Council's GeoMaps show the site to be a part of the Ōtara Creek/Flat Bush catchment. At the time of writing this SMP, Healthy Waters

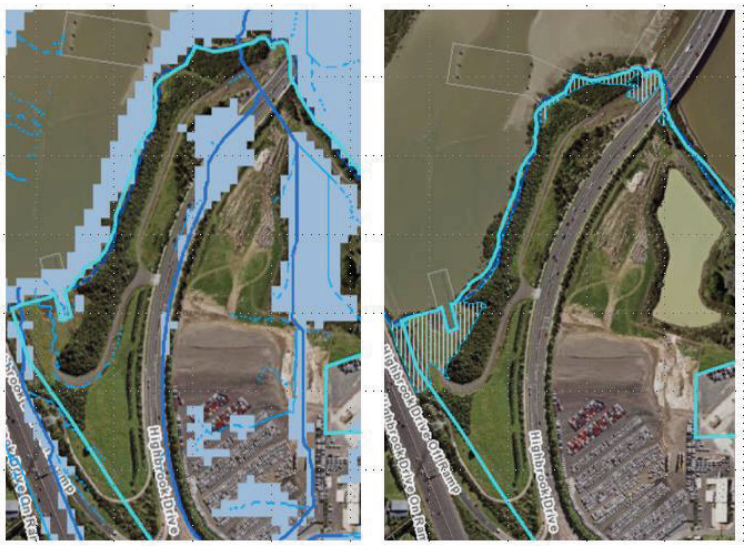


Figure 14: Auckland Council GeoMaps - Floodplain & overland flow paths (left) and Coastal Inundation Control (right)

Requirement	Relevant regulatory / design to follow
	confirmed that currently there is no SMP or CMP for this catchment.

Auckland Council Regionwide Network Discharge Consent	• The Regionwide Stormwater Network Discharge Consent No. DIS60069613 is applicable.
	• Developers who wish to have the stormwater diversion and discharge associated with their proposal authorised by the NDC need to demonstrate that connection requirements under Schedule 4 are met.
	• The connection requirements for Brownfield (large) are applicable to this proposal.
	• Integrated stormwater management approach in accordance with the policies set out in E1, B7, and B8 of the AUP(OP) to:
	  ○ Minimise stormwater related effects
	  ○ Retain/restore natural hydrology as far as practicable
	  ○ Minimise generation and discharge of contaminants and stormwater flows at source
	  ○ Minimise temperature related effects
	  ○ Enhance freshwater systems, including streams and riparian margins
	  ○ Minimise the location of engineered structures in streams
	  ○ Protect the values of SEAs as identified in the AUP(OP)
	• WATER QUALITY: Where discharge is to degraded or sensitive aquatic environment, treatment of all impervious areas by water quality device designed in accordance with GD01/TP10. Figure B7.4.2.1 identifies the Tāmaki Estuary as a degraded environment (Coastal Degraded 1).
	• Alternatives to water quality measures may be determined through an SMP that applies an Integrated Stormwater Management approach; meets Schedule 2 of the NDC; and is the best practicable option.
	• ASSETS: New assets to become part of the public network to meet the required level of service for the life of the asset. Vesting is subject to any required approvals under Stormwater Bylaw, and the Stormwater Code of Practice. Assets in the road corridor require approval from Auckland Transport.

3 Mana whenua: Te ao Māori and mātauranga

3.1 Identification and incorporation of mana whenua values

Four mana whenua groups acknowledged interest in the PC site, these groups were Ngāti Te Ata, Ngāti Tamaoho, Te Ākitai Waiohua and Ngāi Tai Ki Tāmaki. Consultation is on-going, with all four groups agreeing to provide a Cultural Values Assessment (CVA). A summary of the consultation is in the table below:

Mana Whenua Group	Summary of Consultation
• Ngāti Maru Rūnanga • Ngāti Tamaterā • Ngāti Whanaunga • Te Ahiwaru – Waiohua • Ngāti Pāoa • Waikato - Tainui	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. No interest was registered.
Te Kawerau ā Maki	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. Response received on 4 November 2021, confirming that Te Kawerau ā Maki have shared ancestral interests in the PC area and have extremely high cultural sensitivity in relation to the awa and the shoreline. Te Kawerau ā Maki deferred to their whanaunga Kaitiaki to respond to and lead input into the PC Request: Ngāti Pāoa, Te Ākitai Waiohua and Ngāti tai ki Tāmaki.
Ngāti Te Ata	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. A meeting with Ngāti Te Ata's representative was held on 13 December 2021, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The applicant is committed to ongoing consultation with Ngāti Te Ata.
Ngāti Tamaoho	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua.

	A meeting with Ngāti Tamaoho's representatives was held on 13 December 21. An overview of the plan change was provided. Ngāti Tamaoho has prepared a Cultural Values Assessment (Technical Report 10 in Appendix 4). The applicant is committed to ongoing consultation with Ngāti Tamaoho.
Te Ākitai Waiohua	Letter provided with an overview of the PC Request, including attachments of maps on 2 November 2021 requesting acknowledgement of potential interest matters for Mana Whenua. On 22 March 2022, a site walkover meeting was held with Te Ākitai Waiohua's representative, and he confirmed that a Cultural Values Assessment is required. It was agreed that the Cultural Values Assessment would be completed following the lodgement of the PC Request with Auckland Council. The applicant is committed to ongoing consultation with Te Ākitai Waiohua.

A CVA has been prepared by Ngāti Tamaoho (Technical Report 10, Appendix 4). The report identifies the following key stormwater management matters:

- GD01 and GD04 stormwater guidelines are supported as appropriates means in stormwater mitigation;
- Use of low impact green stormwater infrastructure, reuse of clean roof water for non-potable reuse, capture for reuse of rainwater;
- Treatment train approach to all accesses and road runoff, including the use of enviro pods or similar within internal cesspits;
- Native riparian planting of 10 meters along waterways; and
- Creating a 'mana o te wai' plan to ensure the health of Te Wai O Taiki and Waitematā is not only maintained but increased.

In terms of addressing the above matters, the SMP has addressed water quality treatment of all impervious areas by recommending water quality device designed in accordance with GD01, along with other methods outlined for the management of stormwater systems to ensure comprehensive Water Sensitive Design (WSD) as outlined in GD04.

Pertaining to those other key matters, the client will meaningfully engage with Ngāti Tamaoho governance and kaitiaki in meeting the recommendations outlined above. Further investigation will be given to those matters forming part of the detailed design phase.

Furthermore, the applicant is committed to ongoing discussions and consultation with all four mana whenua groups in relation to cultural heritage values, and the effects on Wai O Taiki (Tāmaki River).

4 Stakeholder engagement and consultation

The area subject to the Private Plan Change Request is deemed to be brown-field land. The wider consultation undertaken in respect of the Plan Change is set out in the Statutory Assessment Report. The applicant is committed to undertaking further consultation with mana whenua groups and key stakeholders as part of the continued processing of this Plan Change Request. The applicant is also committed to undertaking further consultation with the key stakeholders (including Auckland Council and mana whenua) as part of the detailed design process at the land development stage. Refer to the table below summarising consultation with the key stakeholders.

Key stakeholder/ Organisation	Summary of Consultation
Tāmaki Estuary Protection Society	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Tāmaki Estuary Protection Society on 21 March 2022. The following key matters were raised: • concerns regarding potential contaminants in the Tāmaki River and Ōtara Creek. • Concerns regarding effects of the PC on the roosting of the shorebirds. In response to the concerns raised, the Ecological Assessment Memo was updated to include consideration of effects on the coastal bird species using the weir at the mouth of the Ōtara Creek (where it flows into Tāmaki Riaver) for roosting.

	In response to the concerns regarding contamination matters, a Land Contamination Review Report was prepared to identify current or historical potential for contamination sources in the PC area.
Greater East Tamaki Business Association (GETBA).	Letter provided with an overview of the Plan Change Request, including attachments of maps on 3 March 2022. A meeting was held with the representatives of the GETBA on 29 March 2022. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Requested that all existing cameras used for crime prevention adjacent to underpass remain. The information relating to the location of existing crossings was provided on 31 March 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Ōtara Waterways & Lake Trust	Letter provided with an overview of the Plan Change Request, including attachments of maps on 25 February 2022. A meeting was held with the representatives of the Ōtara Waterways & Lake Trust on 4 April 2022. The following key matters were raised: • Concerns regarding existing signalised crossings and the new proposed access.

	• Requested maps identifying the locations of all the existing crossing in proximity to the PC area. • Concerns regarding the number of car parks and capacity within the development. • Requested information on Mana Whenua groups being consulted. The information requested was provided on 20 April 2022. The PC Request is informed by an Integrated Transport Assessment, which includes consideration of traffic effects on Highbrook Drive.
Goodman Property Trust (Goodman)	A meeting was held with the representatives of Goodman on 28 March 2022 to provide an overview of the PC Request. The following key matters were raised: • Additional traffic effects arising from the PC Request, noting the existing congestion on Highbrook Drive. • Need to ensure that the proposed residential development is of a high quality noting its location at the entrance to Highbrook Business Park, an area of significant investment for Goodman. The ITA was provided to Goodman on 7 July 2022 for review by their independent specialists.
Ōtara-Papatoetoe Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 2 March 22. An overview of the PC was provided to the Ōtara - Papatoetoe Local board in their workshop meeting on 26 April 22. The Board as interested it the following key matters: • The type of housing to be developed. • Interested to know whether there would be any social procurement schemes to allow public to participate in landscaping/ design or communal gardens.

	• Requested that the PC incorporate greenways in providing connectivity to the PC area. Ōtara-Papatoetoe Local Board will review the PC Request when lodged via the statutory process.
Howick Local Board	Letter provided with an overview of the Plan Change Request, including attachments of maps on 02 March 22. The Howick Local Board declined the request for a meeting, as comments of the Board are to be provided following the lodgement of the PC Request via the statutory process.
Waka Kotahi and AT	Multiple meetings have been held with Waka Kotahi and AT representatives to discuss the various aspects of the PC Request, including: • Need for future development within the PC area to secure access to Waka Kotahi's stormwater pond adjoining the PC area. The applicant agrees that this will be provided at the land development phase. • Noting the proximity to SH1 and Highbrook Drive, the PC should consider potential elevated noise environment and need for noise mitigation. The applicant agrees with this request, and has proposed noise mitigation measures in the PC Request. • Need for an ITA to assess traffic effects on the SH1 and Highbrook interchange and the other roads in the proximity of the PC area. The draft ITA was provided to Waka Kotahi and AT for review prior to lodgement. Feedback received was incorporated into ITA submitted with the PC Request. The findings and recommendations of the ITA have been incorporated into the PC Request. • Need to illustrate that the current zoning of the site is unable to be utilised for its intended purposes.

Transpower New Zealand	A meeting with Transpower's representative was held on 3 September 2021. The key following matters were discussed: • There are no concerns in relation to the effects of the PC on the Ōtara Substation given the separation distance between the two. • Ensure that there is no development proposed underneath the National Grid infrastructure. • Ensure that the proposed development does not restrict access to the National Grid Tower beside the PC area. The applicant agrees that access to the Tower will be provided at the land development stage. The applicant is committed to consulting with Transpower at the land development phase.

5 Stormwater management

5.1 Principles of stormwater management

Auckland Council GeoMaps show the site to be within the Ōtara catchment. Healthy Waters has confirmed that, currently the Ōtara catchment does not have a Stormwater Management Plan (SMP) or Catchment management Plan (CMP). Therefore, guidance for stormwater management in this site cannot be drawn from a SMP/CMP for the wider catchment this site is in. Notwithstanding that, the stormwater management assets will be vested in Auckland Council following the development of this site. Therefore, stormwater management system designed for this site will need to meet the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent (NDC) that the Auckland Council holds.

The connection requirements outlined in Schedule 4 of the NDC for brownfield developments include:

1. Water Quality: Treatment of all impervious areas by a water quality device designed in accordance with GD01/TP 10 for the relevant contaminants.

2. Stream Hydrology: Where discharge is to a stream via public stormwater outside of SMAF – meet SMAF 1/SMAF 2 requirements.

3. Flooding:
    1. Ensure there is sufficient capacity within the pipe network downstream of the connection point to cater for the additional stormwater runoff associated with the development in a 10% AEP event.
    2. Demonstrate that flows in excess of the pipe capacity in a 10% AEP event within the pipe network downstream of the connection point will not increase adverse effects on any other property.

4. Buildings – 1% AEP event: Manage/mitigate 1% peak flows to that immediately preceding development/redevelopment.

The requirements of stormwater management for this site in the order of priority is as follows:

1. ***Provision of quality stormwater infrastructure*** – It is vital to provide quality stormwater infrastructure to maintain healthy waterways and to mitigate risks to our communities, people and property. Moreover, quality stormwater infrastructure ensures that the strategic objectives and the connection requirements under the NDC are met.

2. ***Water quality management*** – The section of Tāmaki Estuary and the Ōtara Creek in the vicinity of the site is within the Hauraki Gulf catchment area. SEA areas are mapped upstream of the site and on the far bank of the Tāmaki Estuary (opposite

side of the subject site). Therefore, maintaining or improving the water quality in the Tāmaki Estuary and Ōtara Creek is a priority of the stormwater system for this site.

3. ***Mitigation of erosion at the outfall and protection and protection/enhancement of the SEA*** – Currently, there is no known coastal erosion along the banks of Tāmaki Estuary in the vicinity of the site. It is important to maintain this condition post development. Therefore, the stormwater system proposed for this site needs to protect and enhance the banks of the Tāmaki Estuary.

4. **Managing flows in excess of the pipe capacity i.e., secondary flows** – Managing flows in excess of pipe capacity protects people, properties and our communities in storm events in excess of 10% AEP. This also mitigates the risk of flooding of habitable floors during major storm events. Therefore, the stormwater management system for this site needs to provide a 10% AEP storm event level of service.

5. ***Mitigating risk of 1% peak flows having adverse impact on development/redevelopment*** – The habitable floors in this site need to be above the coastal inundation level calculated for this site to mitigate the exposure of the development to climate change impacts and flooding during major storms. This measure, in conjunction with managing secondary flows will provide a satisfactory level of protection to habitable floors in future buildings on this site.

The site is located at the bottom of the Ōtara Creek catchment. Stormwater flows from this site discharge to the Tāmaki Estuary. The hydrological benefits of flow attenuation diminish substantially at the bottom of a catchment. In addition, there are no known flooding issues in the Tāmaki Estuary downstream of the site, nor are there any known coastal erosion issues in the vicinity of the site. Therefore, attenuation of flows is deemed unnecessary. Nonetheless, the topography and the nature of the development anticipated in the THAB Zone lends itself to incorporating rainwater harvesting within the site, which offer substantial benefits. This along with other methods outlined for the management of stormwater systems for this site, will result in comprehensive Water Sensitive Design (WSD) which is defined in GD04 as:

"*An approach to freshwater management, it is applied to land use planning and development at complementary scales, including region, catchment, development and site. Water sensitive design seeks to protect and enhance natural freshwater systems, sustainably manage water resources, and mimic natural processes to achieve enhanced outcomes for ecosystems and or communities*".

Integrated approaches such as WSD minimise the adverse effects of growth and development on freshwater systems and coastal waters. It is Auckland Council's preferred stormwater management approach. Therefore, the future development of the site should explore options to harvest rainwater on this site.

The strategic objectives of the NDC applicable for this site include:

1. *Healthy and connected waterways that provide for te mauri o te wai: Stream, groundwater and coastal water values are maintained and enhanced and communities are connected with them.*

2. *Support growth through water sensitive development and provision of quality stormwater infrastructure is enabled.*

3. *Risk to our communities, including people, property and infrastructure is reduced.*

The principles of stormwater management outlined in this section will assist the future development to comply with the strategic objectives mentioned above.

5.2 Proposed stormwater management

The objective of this Stormwater Management Plan is to outline the principles to ensure that the connection requirements and the strategic objectives of the NDC are met. A detailed design of the future stormwater management system will be developed at the time of applying for Resource Consents.

5.2.1 General

A new stormwater management system will replace the current stormwater management system on site comprising of table drains, a 300 mm stormwater culvert across the gravel road and a catchpit. The new stormwater system will be a piped stormwater reticulation system with suitable stormwater treatment devices that comply with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. A detailed design of this stormwater management system will be developed in the future to support the Resource Consent application. Once implemented, this new stormwater management system will service all buildings, impervious areas, and some permeable areas i.e., these areas will be 'connected'. The remainder of the pervious areas (less than 30% of the total site) viz., including the area of the future esplanade reserve, will remain 'unconnected' thereby draining directly to the Tāmaki River.

5.2.2 Water quality

The proposal is to treat stormwater from the entire site using new treatment devices that are designed to comply with GD01/TP10. The existing stormwater pond that treats runoff from a small area (0.9ha) of Highbrook Drive (refer to Figure 1) will need to be decommissioned to enable development within this portion of the site. To enable decommissioning this pond, the proposal is to combine the treatment of runoff from the subject section of Highbrook Drive with that from the site in device(s) to be constructed. This can be achieved by extending the inlet pipes to the new stormwater treatment device(s). Once vested in Auckland Council, this will reduce the operation and maintenance requirements for one treatment pond.

The water quality volumes that we have calculated for the maximum probable development (MPD) within the site is included in Appendix C2.

While the detailed design of the water quality pond is to be undertaken at the time of the Resource Consent application, we have completed a preliminary, high-level assessment of the stormwater treatment volumes. Based on this assessment, a total of 765 m^3 of runoff will need to be treated, comprising 157 m^3 generated by the Highbrook Drive catchment and 608 m^3 from the site itself.

The proposed development plan and the topography of the site allows for the following four options for stormwater treatment:

1. A wetland (or a coastal wetland) constructed in conjunction with the creation of the esplanade reserve along the banks of the Tāmaki estuary.
2. Two stormwater treatment ponds or proprietary treatment devices (viz., Stormfilters) at both ends of the site to treat approximately half the site in each device.
3. Raingardens constructed along the proposed road.

Raingardens (Option 3) are not preferred, owing to operation and maintenance requirements and Auckland Transport's preference to not have them in the road corridor. Therefore, options 1 or 2 are recommended for this site. A concept plan of stormwater treatment options is set out in Appendix C1. The locations of the stormwater treatment devices shown in the concept plan are indicative only. The exact location of the treatment devices will be finalised in conjunction with the development plan.

5.2.3 Flooding 10 percent AEP event (Network Capacity)

A detailed design of this stormwater management system will be confirmed in the future at the land development stage to support the Resource Consent application. This new stormwater system will be a piped stormwater reticulation system that complies with the Auckland Council's Stormwater Code of Practice Version 3 that is effective from January 2022. As such, the network will have adequate capacity to convey 10% AEP event flows. The overland flows will be along the roads to be formed. No secondary flow structures viz., culverts are deemed necessary.

Our review of the Auckland Council's GeoMaps has confirmed that there are no flood prone/flood sensitive areas along the Tāmaki Estuary downstream of the site during 10% AEP or 100% AEP events. The only flood prone location in the vicinity of the site is a localised depression along Highbrook Drive next to the treatment pond. Based on our site inspection, should the flood waters overtop the kerbs, this area will drain to Ōtara Creek via the service road bypassing the site.

5.2.4 Flooding 1 percent AEP event (Habitable floors)

As discussed in the previous section of this report, this site or the properties along the banks of Tāmaki Estuary downstream of the site, are not flood prone nor flood sensitive. Only a small portion of the site in the vicinity of the barge dock (on the western side of the site) and the northern tip of the site that are at RL 2.0 m are expected to get inundated by 0.34 m during a 1% AEP event. The future development of the site will be carefully designed to

ensure that habitable floors are not proposed in the section of the site that is prone to inundation. Locations for the stormwater treatment devices will be finalised as a part of the development to mitigate the risk of them being in the flood plains.

5.2.5 Overland flowpath and floodplain management

As discussed in section 1.8 of this report, there are no overland paths entering the site from neighbouring properties. The two overland flow paths in the site coincide with the table drains along the existing gravel roads. The future road network for this site is able to be aligned with the existing gravel roads. As such the overland flow paths within the site can remain largely unchanged after the development. Moreover, future development on the site is not expected to affect downstream properties by way of new or altered overland flow paths as the stormwater runoff discharges directly to the Tāmaki Estuary.

5.3 Hydraulic connectivity

The post-development stormwater management system proposed for this site comprises of a pipe network and treatment devices. The pipe network to service the site will be independent of the existing Auckland Council's stormwater network because of the site's location in relation to existing Auckland Council stormwater network. Stormwater flows from the site will discharge directly into Tāmaki Estuary after treatment. As such, the hydraulic connectivity will be directly to the Tāmaki Estuary flows.

The time of concentration (ToC) for the flows from the site will be significantly less than the ToC for the flows in Tāmaki Estuary or the Ōtara Creek in the vicinity of the site.

5.4 Asset ownership

The proposal is to vest the entire stormwater management system to be developed for this site, in Auckland Council. The future asset ownership will be with Auckland Council.

5.5 Ongoing maintenance requirements

The stormwater management system for the site will be designed in the future at the land development phase. Details of ongoing maintenance requirements will be outlined in the Resource Consent stage. Notwithstanding that, the stormwater management proposed for the site will comprise of a pipe network and stormwater treatment device(s) that comply with the requirements of GD01 and the Stormwater Code of Practice Version 3. As such, no bespoke operation and maintenance requirements are envisaged. They will be consistent with the operation and maintenance requirements of the wider Auckland Council stormwater network.

5.6 Implementation of stormwater network

The stormwater network to service the site will be implemented in the future at land development stage.

5.7 Dependencies

As discussed earlier, the pipe network to service the site will be independent of the existing Auckland Council's stormwater network due of the site's location in relation to the existing

Auckland Council stormwater network. Stormwater flows from the site discharge directly into Tāmaki Estuary after treatment. As such, it is not dependent on the implementation or upgrade of the Auckland Council's current stormwater network.

It is proposed to decommission the existing stormwater treatment pond that services 0.9ha of a section of Highbrook Drive. This can be decommissioned only after a suitable device to treat the stormwater flows from the site and the subject section of Highbrook Drive is constructed. This is the only dependency that is envisaged.

5.8 Risks

No risks to the wider Auckland Council stormwater management system is envisaged from the proposed plan change or the future development of the site.

6 Departures from regulatory or design codes

There are no departures proposed as part of this Stormwater Management Plan.

7 Conclusions and recommendations for future work

[insert chapter introduction statement here]

7.1 Conclusions

The principles outlined for the proposed stormwater management system is consistent with the objectives of the NDC. The proposed stormwater management system meets the connection requirements under Schedule 4 of the Regionwide Network Discharge Consent (NDC) that the Auckland Council holds. There are no departures from the Auckland Council Code of Practice or the connection requirements of the NDC.

Changing the zoning from Light Industry to THAB will have a lesser impact on the environment from the perspective of stormwater management. Under the AUP(OP), the maximum permissible impervious area in the THAB Zone is less than that in the Light Industry Zone. This will result in reduced stormwater runoff volume and peak flows into the receiving environment. Rezoning the land as proposed will not result in any material difference in water quality, as in both cases, runoff will need to be treated to comply with the guidelines in GD01/TP10 and conditions of the Network Discharge Consent (NDC).

Establishing a combined treatment facility for the site and subject section of Highbrook Drive (currently being treated in a separate pond), will reduce maintenance requirements for Auckland Council. The opportunity to create wetland along the bank of the Tamaki Estuary will result in high level of amenity for the public, similar to the stormwater treatment facilities in the Highbrook Business Park further north along Highbrook Drive.

Rezoning as proposed has the potential for improvements both in the short term (establishment of an Esplanade Reserve area) and the long term (residential amenity). Establishment of an Esplanade Reserve in the future will provide public access and amenity, with ongoing maintenance of the coastal vegetation. In addition, residential development offers greater opportunities for planting, maintenance and enhancement of the main part of the site, as well as the coastal area.

7.2 Recommendations

Our recommendation is that the subject site, being part of 8 Sparky Road, Ōtara with a parcel ID 7534518, be rezoned for residential development. We also recommend disestablishing the current stormwater pond that treats 0.9ha of Highbrook Drive in favour of a combined treatment facility.

Appendix A1 – Site Plan

Appendix A - Sheet 1
Site Plan

Babbage

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CLIENT / PROJECT

Stonehill Trustees

Highbrook Private Plan Change

MAP TITLE

Map No 1. Site Plan

MAP REVISIONS

15/10/2021	Initial version by TT.

Legend

- Highbrook Site Boundary
- Contours Line (RL)
  - 0.5

NOTES
Aerial Images - LINZ Basemap

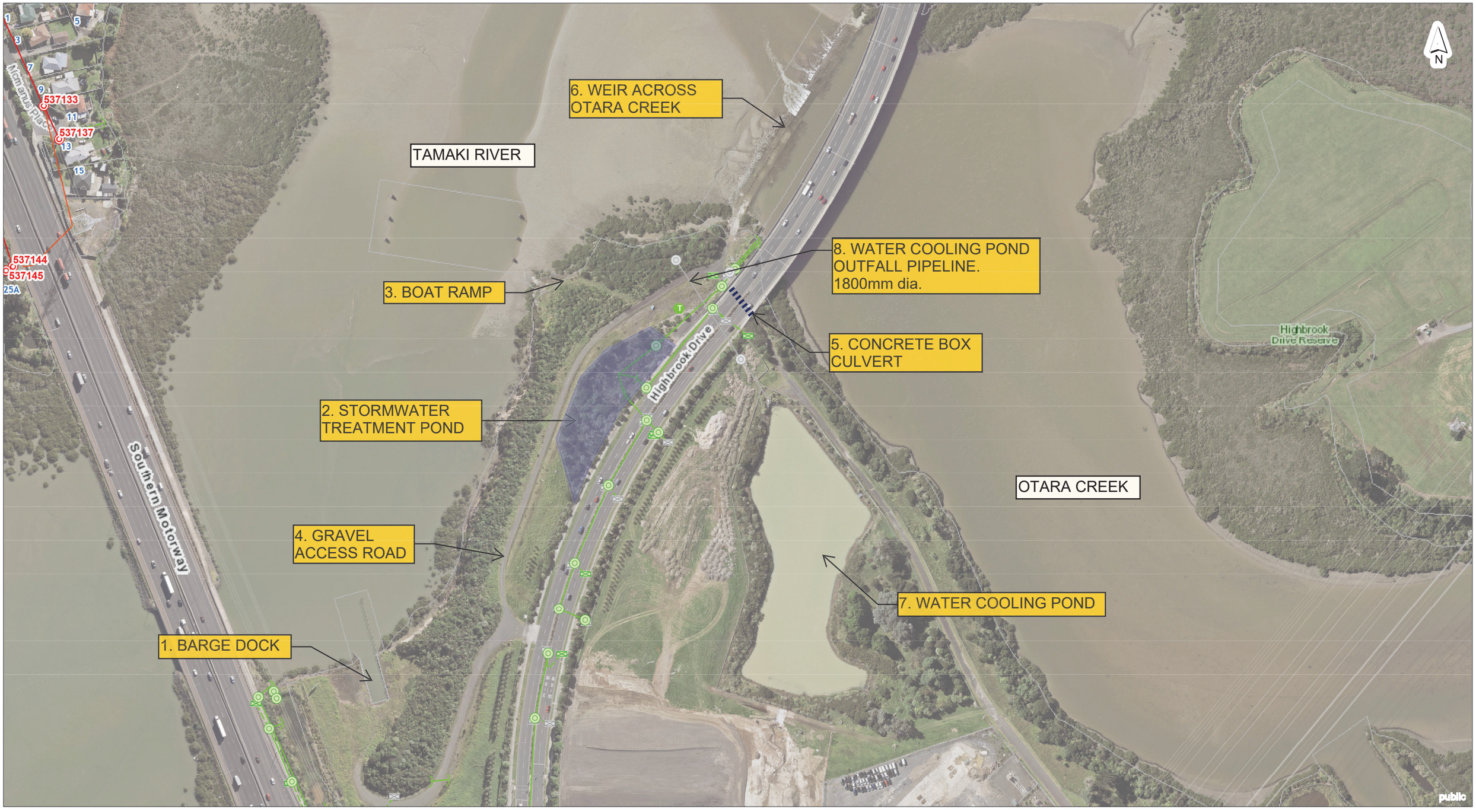
DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 @ A3

MAP NO.

64872#BEE02 01



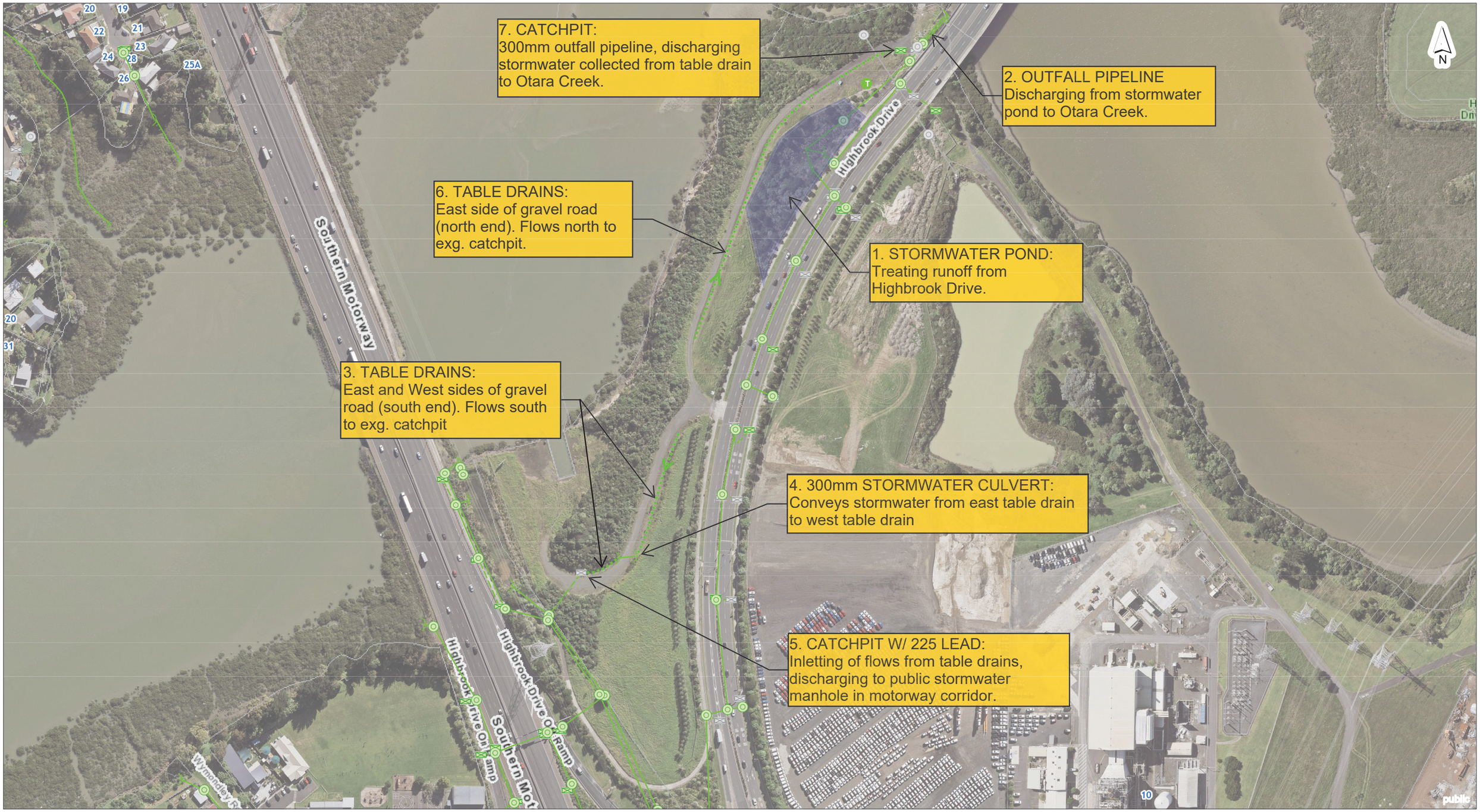
Appendix A - Sheet 2
Existing Site Features Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
22/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau



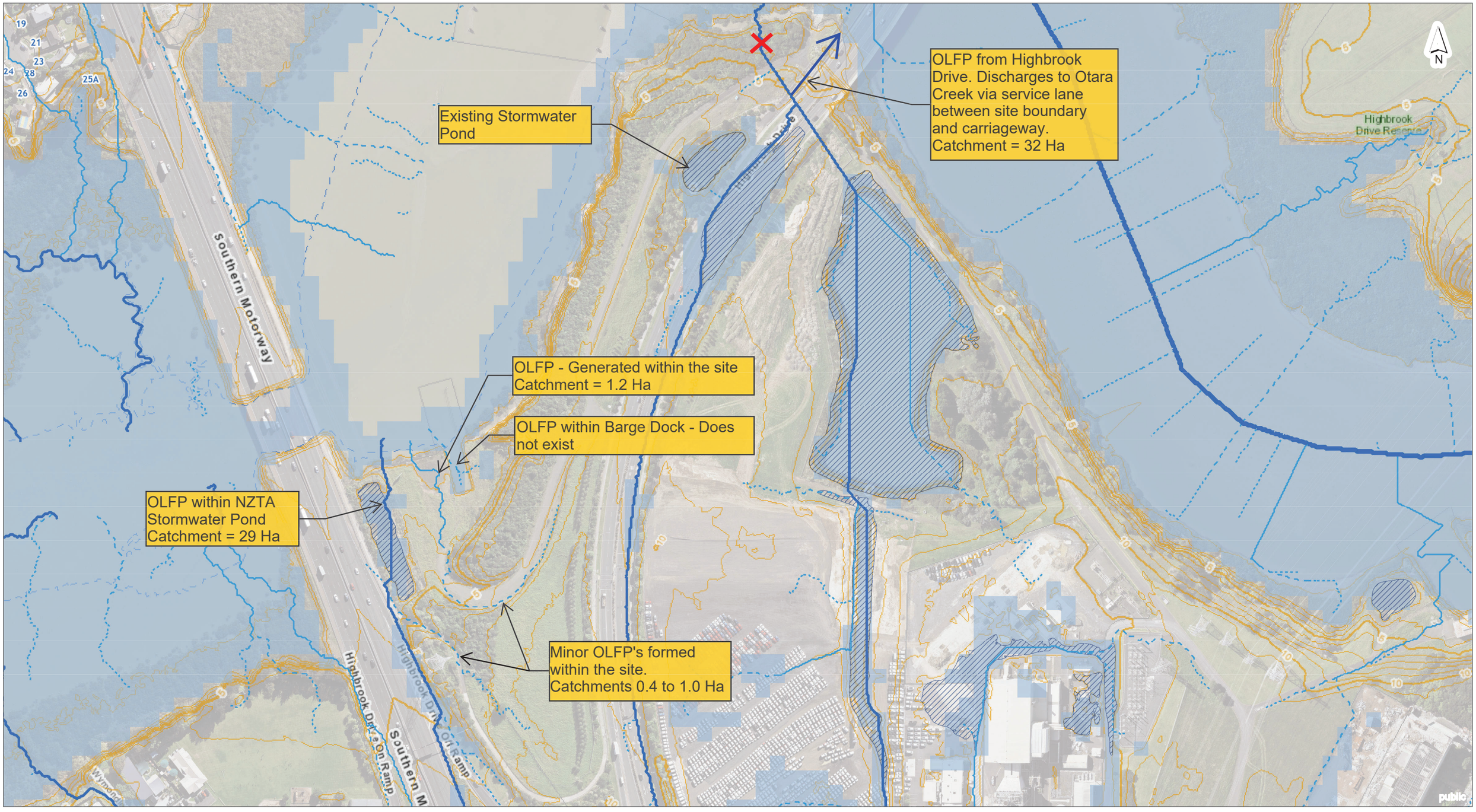
Appendix A - Sheet 3
Existing Drainage Features Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
16/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau



Appendix A - Sheet 4
Flood Hazards Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
23/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A - Sheet 5
1%AEP Coastal Inundation Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
24/11/2021

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix A2 – Site Historical Activities Plan

Appendix A2 - Sheet 1
Site Historical Activities Plan

Babbage

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CLIENT / PROJECT

Stonehill Trustees

Highbrook Private Plan Change

MAP TITLE

Map No 2. Former Investigations and Soil Disturbed Areas - Potential Contaminated Land

MAP REVISIONS

06/04/2022	Initial version by TT.

Legend

- 8 Sparky Road Site
- Highbrook Site Boundaries

Potential Contaminated Land Areas - Highbrook Site

- Area 1 - Reclamation (1969 - 1979)
- Area 2 - Reclamation (1967)
- Area 3 - Former Tank Farm (1967 - 2003)
- Area 5 - Former Construction Yard Area (2006)
- Area 4 - Soil/Fill Material Stockpiled (2006)

Former Intrusive Investigations

- Areas of T&T 2011 Investigation
- T&T 2011
- T&T 2011
- Not Investigated
- Area of GSL2018 DSI Investigation
- Area of GSL2019 Investigation

NOTES
Aerial Images - LINZ Basemap
Land Parcels - Auckland Council Geomaps

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:3,000 **@ A3**

MAP NO.

64872#BEE02 **01**

Appendix B – Proposed Development Architectural Plans

HIGHBROOK LIVING DEVELOPMENT CONCEPT PLAN

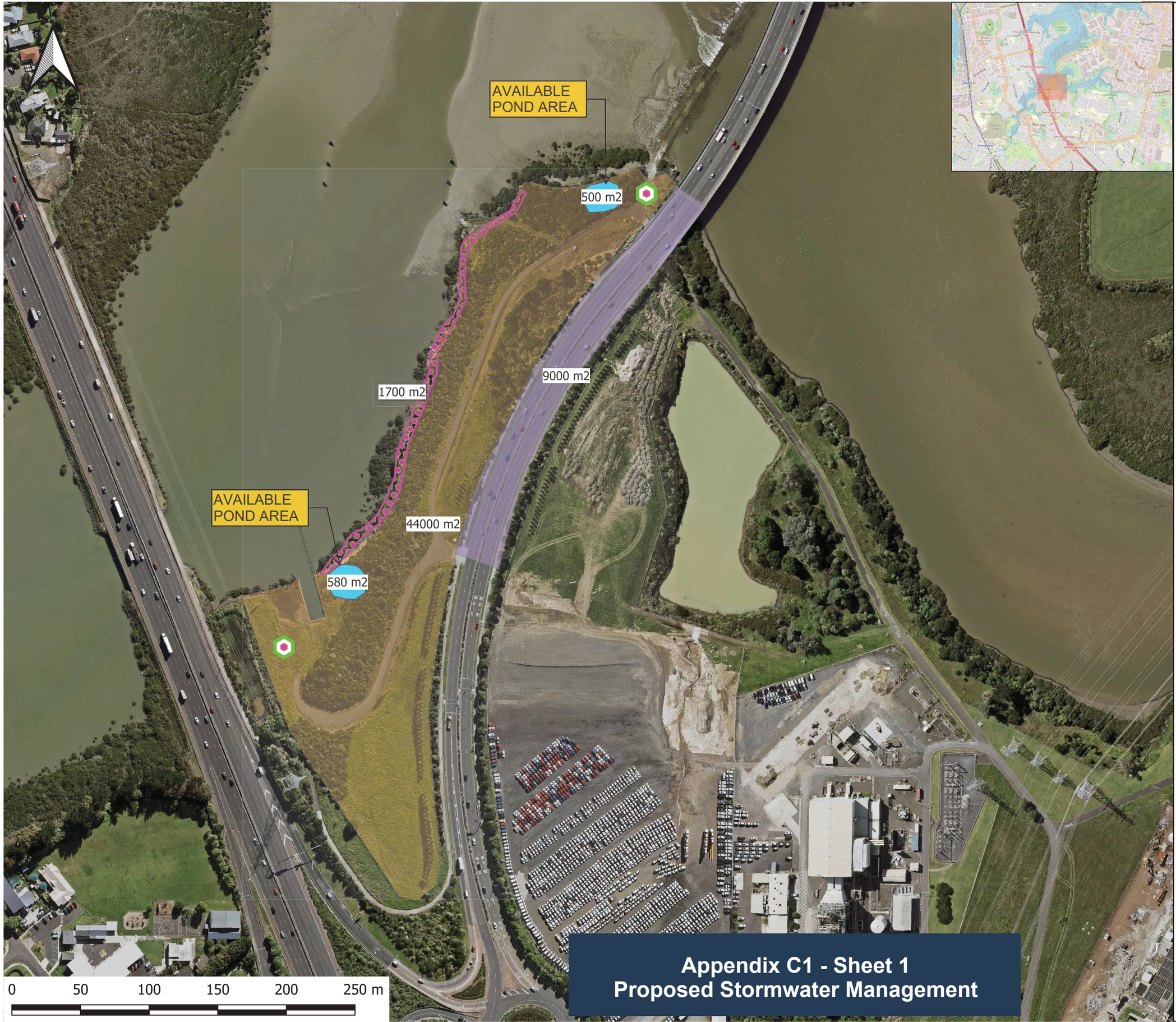
Key:

A Dairy
B Shared Office Facility
C Cafe
D Apartment Blocks -predominantly five storeys
E Terrace Houses
F Stand alone houses / Duplexes

BABBAGE CONSULTANTS

18 February 2022

Appendix C1 – Proposed Stormwater Management



Appendix C1 - Sheet 1
Proposed Stormwater Management

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CLIENT / PROJECT

Stormwater Management Plan
Highbrook Living

Terraced/Town housing Planning

MAP TITLE

Terraced/Town housing Planning in Highbrook

MAP REVISIONS

28/10/2021	Initial version by v1.

Legend

- Area-1 : 70% Impervious surface area
- Area-2 : 90% Impervious surface area
- Option 1- Wetland
- Option 2- Ponds
- Option 3- Proprietary SW treatment devices

NOTES

Mapped 21/10/2021 by Sundra Tatiparthi

SOURCES

1. Aerial photograph: LINZ Basemap, 2020
2. Road and boundary information: LINZ Data

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

@ A3

MAP NO.

Project No.	Map No.	Rev No.
64872	1	v1

Appendix C2 – Stormwater Runoff Calculations

JOB NAME:	Highbrook Living	**DATE:**	20.04.2022
JOB NO:	64872	**DES BY:**	MB
SUBJECT:	SW Runoff Calculation - Highbrook Drive	**CHKD BY:**	SK

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TP108 RUNOFF CALCULATIONS

◄◄◄ INPUT VALUES
◄◄◄ OUTPUT VALUES

1. PRE-DEVELOPMENT CATCHMENT:

Impervious Area	ha	0.7700
SCS Curve Number (CN)		98
Pervious Area	ha	0.1400
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	0.9100
% Impervious		85%

Catchment Slope (S_c)	m/m	0.01
Catchment Length (l)	m	350
Channelisation Factor (C)		0.6
Weighted Curve Number		94.3
Initial Abstraction (Ia) weighted	mm	0.769
t_c (For q* - TP108 Fig. 5.1)	hours	0.18
t_p (SCS Lag for HEC-HMS)	hours	0.12
Storage (S) Total	mm	15.3
Pervious	mm	89.2
Impervious	mm	5.2

Table 3.3 - Curve numbers for typical Auckland conditions

Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (mudstone/sandstone)
Bush, humid-climate, not-grazed	30	55	70
Pasture, lightly grazed, good grass cover	39	61	74
Urban lawns	39	61	74
Crops, straight rows, minimal vegetative cover	72	81	88
Scaled roads, roofs	98	98	98

Apply Climate Change to Pre-development Scenario? Yes Select Yes or No

Select appropriate design storm →			90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24})		mm	24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24})		mm	24	125	158	257
c*=(P24-2Ia)/(P24-2Ia+2S)			0.423	0.802	0.837	0.893
q* (from Fig. 5.1)			0.109	0.158	0.158	0.158
Peak Flowrate (q_p)		l/s	23.8	180.0	227.6	369.0
24 hour rainfall depth (Q_{24})	Pervious	mm	3	69	97	186
24 hour rainfall depth (Q_{24})	Impervious	mm	20	120	153	252
24 hour runoff volume (V24)	Pervious	m^3	4.7	96.7	135.9	260.5
24 hour runoff volume (V24)	Impervious	m^3	152.0	926.9	1181.6	1939.5
24 hour runoff volume (V24)	Total	m^3	156.6	1023.6	1317.5	2199.9

← *Refer TP108 - App A - Design Rainfall Maps*

← *Refer Stormwater Code of Practice - Table 4.1*

Auckland Council - Stormwater Code of Practice - Climate Change

Table 4.1: Percentage Increase in 24-hour Design Rainfall Depth

AEP	50%	20%	10%	5%	2%	1%
ARI	2 yr	5 yr	10 yr	20 yr	50 yr	100 yr
% Increase *	9.0%	11.3%	13.2%	15.1%	16.8%	16.8%

* in 24-Hour Design Rainfall Depth Due to Future Climate Change assuming 2.1°C increase in temperature

JOB NAME:	Highbrook Living	**DATE:**	20.04.2022
JOB NO:	64872	**DES BY:**	MB
SUBJECT:	SW Runoff Calculation - Site Only	**CHKD BY:**	SK

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TP108 RUNOFF CALCULATIONS

◄◄◄ INPUT VALUES
◄◄◄ OUTPUT VALUES

1. PRE-DEVELOPMENT CATCHMENT:

Impervious Area	ha	0.0000
SCS Curve Number (CN)		98
Pervious Area	ha	4.4000
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	4.4000
% Impervious		0%

Catchment Slope (S_c)	m/m	0.03
Catchment Length (l)	m	350
Channelisation Factor (C)		1
Weighted Curve Number		74.0
Initial Abstraction (Ia) weighted	mm	5.000
t_c (For q* - TP108 Fig. 5.1)	hours	0.27
t_p (SCS Lag for HEC-HMS)	hours	0.18
Storage (S) Total	mm	89.2
Pervious	mm	89.2
Impervious	mm	5.2

Table 3.3 - Curve numbers for typical Auckland conditions

Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (mudstone/sandstone)
Bush, humid-climate, not-grazed	30	55	70
Pasture, lightly grazed, good grass cover	39	61	74
Urban lawns	39	61	74
Crops, straight rows, minimal vegetative cover	72	81	88
Sealed roads, roofs	98	98	98

Apply Climate Change to Pre-development Scenario? No Select Yes or No

Select appropriate design storm →		90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24}) mm		24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24}) mm		24	N/A	N/A	N/A
c*=(P24-2Ia)/(P24-2Ia+2S)		0.073	0.370	0.421	0.541
q* (from Fig. 5.1)		0.020	0.088	0.097	0.116
Peak Flowrate (q_p) l/s		21.2	445.4	599.3	1120.1
24 hour rainfall depth (Q_{24})	Pervious mm	3	61	81	152
24 hour rainfall depth (Q_{24})	Impervious mm	20	110	135	215
24 hour runoff volume (V24)	Pervious m^3	146.7	2672.1	3576.0	6685.1
24 hour runoff volume (V24)	Impervious m^3	0.0	0.0	0.0	0.0
24 hour runoff volume (V24)	Total m^3	146.7	2672.1	3576.0	6685.1

← *Refer TP108 - App A - Design Rainfall Maps*
← *Refer Stormwater Code of Practice - Table 4.1*

2. POST-DEVELOPMENT CATCHMENT:

Impervious Area	ha	3.0800
SCS Curve Number (CN)		98
Pervious Area	ha	1.3200
Hydrological Soil Group		Group_C
SCS Curve Number (CN)		74
total area	ha	4.4000
% Impervious		70%

Catchment Slope (S_c)	m/m	0.03
Catchment Length (l)	m	350
Channelisation Factor (C)		0.6
Weighted Curve Number		90.8
Initial Abstraction (Ia) weighted	mm	1.500
t_c (For q* - TP108 Fig. 5.1)	hours	0.17
t_p (SCS Lag for HEC-HMS)	hours	0.11
Storage (S) Total	mm	25.7
Pervious	mm	89.2
Impervious	mm	5.2

Auckland Council - Stormwater Code of Practice - Climate Change

Table 4.1: Percentage Increase in 24-hour Design Rainfall Depth

AEP	50%	20%	10%	5%	2%	1%
ARI	2 yr	5 yr	10 yr	20 yr	50 yr	100 yr
% Increase *	9.0%	11.3%	13.2%	15.1%	16.8%	16.8%

* in 24-Hour Design Rainfall Depth Due to Future Climate Change assuming 2.1°C increase in temperature

Select appropriate design storm →		90th Perc	2 yr ARI	10 yr ARI	100 yr ARI
24-Hour Rainfall Depth (P_{24}) mm		24	115	140	220
24-hour rainfall depths with climate change allowances (P_{24}) mm		24	125	158	257
c*=(P24-2Ia)/(P24-2Ia+2S)		0.669	0.922	0.937	0.961
q* (from Fig. 5.1)		0.148	0.162	0.163	0.164
Peak Flowrate (q_p) l/s		156.2	891.8	1135.2	1859.4
24 hour rainfall depth (Q_{24})	Pervious mm	3	69	97	186
24 hour rainfall depth (Q_{24})	Impervious mm	20	120	153	252
24 hour runoff volume (V24)	Pervious m^3	44.0	912.2	1281.1	2456.0
24 hour runoff volume (V24)	Impervious m^3	607.9	3707.5	4726.6	7757.9
24 hour runoff volume (V24)	Total m^3	651.9	4619.7	6007.6	10213.8

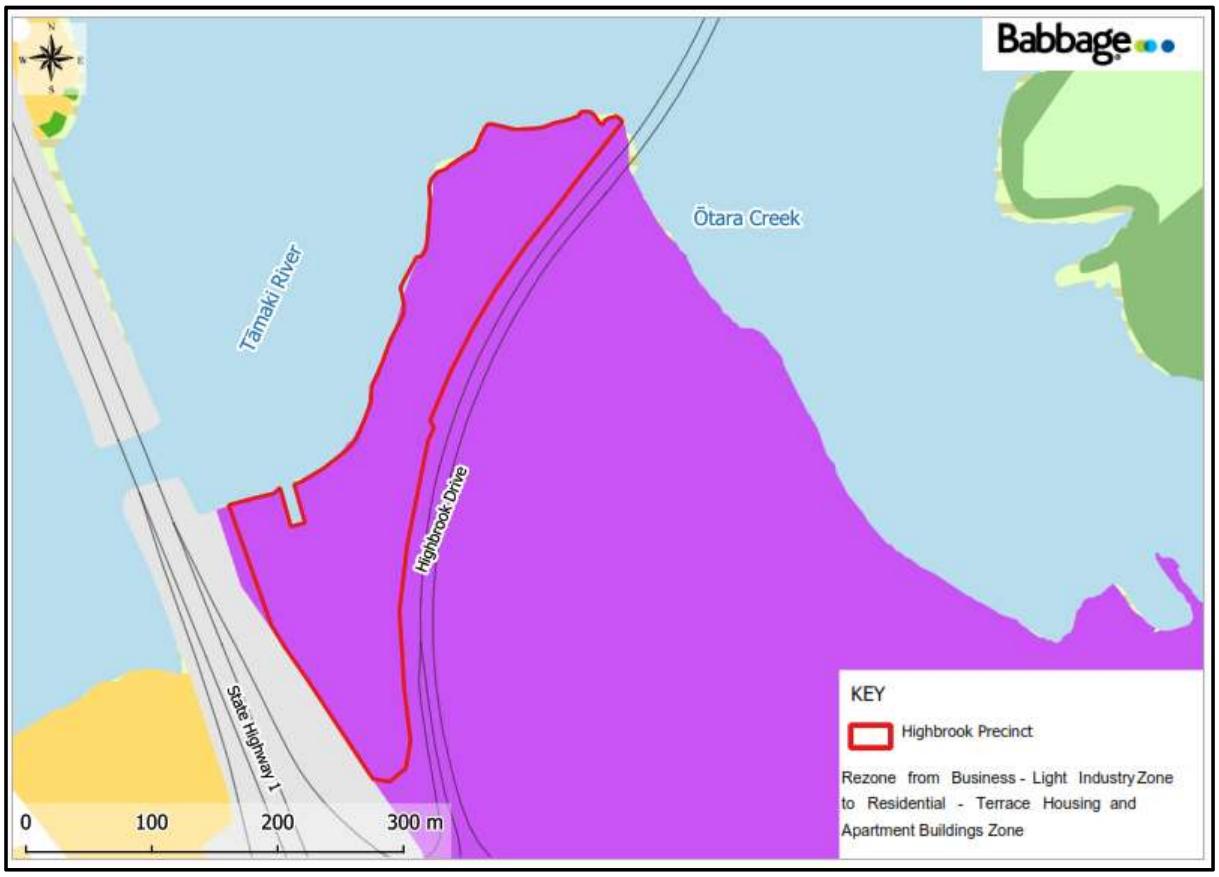
← *Refer TP108 - App A - Design Rainfall Maps*
← *Refer Stormwater Code of Practice - Table 4.1*

Auckland Council
Te Kaunihera o Tāmaki Makaurau

PRIVATE PLAN CHANGE REQUEST – PROPOSED CHANGES TO THE AUCKLAND UNITARY PLAN (OPERATIVE IN PART)

Amend the Auckland Unitary Plan (Operative in Part) as follows:

1) Rezone the Plan Change area as shown below:



2) Insert a new Highbrook Precinct into Chapter I Precincts (South) as set as out below:

I4. Highbrook Precinct

I4.1. Precinct Description

Highbrook Precinct is located beside the Highbrook industrial area. The Precinct is bounded by Tāmaki River, Ōtara Creek, Highbrook Drive and State Highway 1.

The Highbrook Precinct is part of the site which contained the former Ōtāhuhu Power Station. The Tāmaki River and Ōtara Creek environments adjoining the Precinct, contain remnant infrastructure which previously supported the operation of the Ōtāhuhu Power Station.

The Highbrook Precinct is zoned Residential - Terrace Housing and Apartment Buildings Zone. It adjoins the Business – Light Industry Zone located east of Highbrook Drive and applied to the wider Highbrook industrial area.

The purpose of the Precinct is to enable the establishment of high-density residential development in proximity to an important employment hub in Highbrook. The Precinct benefits from visual amenity, landscape and unique urban setting provided by the Tāmaki River environments. Development within the Precinct will integrate with the existing urban environment.

The Precinct seeks to manage adverse effects on the efficient operation of the surrounding road network, in particular on Highbrook Drive and the Highbrook Drive / State Highway 1 roundabout. An Integrated Transport Assessment has confirmed that the development of 200 dwellings (or dwelling unit equivalents) is acceptable within the Precinct, with supporting non-residential land uses (such as a diary, café or shared office spaces).

A revised Integrated Transport Assessment Report (including appropriate forecast transport modelling, and latest Precinct land use assumptions with sensitivity tests of these) is to be prepared to support any resource consent application for development exceeding 200 dwellings (or dwelling unit equivalents).

I4.2. Objectives

(1) Land within the Highbrook Precinct is used efficiently to provide high-density urban living adjacent to the Highbrook industrial area and the Tāmaki River environments.

(2) Activities sensitive to noise are protected from adverse health and amenity effects arising from road traffic noise associated with the operation of State Highway 1 and Highbrook Drive.

(3) Subdivision, use and development within the Highbrook Precinct ensures that adverse effects on the safety, capacity and efficiency of the operation of the local transport network is avoided, remedied or mitigated.

All relevant overlay, Auckland-wide and zone objectives apply in this precinct in addition to those specified above.

I4.3. Policies

(1) Require buildings that contain activities sensitive to noise to be designed and constructed with acoustic attenuation measures to provide for people's health and residential amenity to achieve specified minimum indoor design noise levels.

(2) Limit the number of dwellings within the Highbrook Precinct to 200 dwellings (or dwelling unit equivalents) to ensure that vehicle trip generation from development within the precinct remains within anticipated levels.

(3) Require an Integrated Transport Assessment Report to support a resource consent application for development exceeding 200 dwellings (or dwelling unit equivalents) to ensure that the quantum of development generates appropriate travel demand, and implements the required infrastructure upgrading to ensure that any adverse effects on the safety, capacity and efficiency of the operation of the local transport network is avoided, remedied or mitigated.

(4) Require subdivision and development within the Highbrook Precinct to facilitate a transport network that supports pedestrian, cycle, public transport use and promotes alternative transport choice by requiring:

(a) the preparation of a Highbrook Precinct Transportation Plan.

(b) the upgrading of the shared pedestrian / cycle facilities along the areas shown in Precinct Plan 1.

(c) construction of a bus stop along the Precinct frontage with Highbrook Drive.

(d) installation of a pedestrian barrier along the area shown in Precinct Plan 1 to improve pedestrian safety.

(e) the implementation of a shuttle bus service within the Precinct to provide connections to nearby public transport hubs and town centres.

All relevant overlay, Auckland-wide and zone policies apply in this precinct in addition to those specified above.

I4.4. Activity table

All relevant overlay, Auckland-wide and zone activity tables apply in this precinct unless otherwise specified below.

Activity Table I4.4.1 specifies the activity status of land use and development activities pursuant to section 9(3) and section 11 of the Resource Management Act 1991.

Table I4.4.1 Activity table

Land use and development		Activity status
(A1)	Activities that do not comply with Standard I4.6.5 Road noise attenuation	RD
(A2)	Activities that do not comply with the following Standards: (i) Standard I4.6.1 Maximum number of dwellings (ii) Standard I4.6.2 Highbrook Precinct Transportation Plan (iii) Standard I4.6.3 Upgrading of shared cycle/pedestrian path (iv) Standard I4.6.4 Construction of a bus stop	D

I4.5. Notification

(1) Any application for resource consent for an activity listed in Activity Table I4.4.1 above will be subject to the normal tests for notification under the relevant sections of the Resource Management Act 1991.

(2) When deciding who is an affected person in relation to any activity for the purpose of section 95E of the Resource Management Act 1991 the Council will give specific consideration to those persons listed in Rule C1.13(4).

I4.6. Standards

The overlay, Auckland-wide and zone standards apply in this precinct in addition to the following standards.

All permitted, controlled and restricted discretionary activities must comply with the following standards.

I4.6.1. Maximum number of dwellings

(1) The maximum number of dwellings (or dwelling unit equivalents) in the Highbrook Precinct must not exceed 200.

(2) In Standard I4.6.1(1), dwelling unit equivalents must be calculated as follows:

Type	Equivalent dwellings unit value
Retirement village unit	0.61
Supported residential care	0.46
Visitor accommodation room	1.3

I4.6.2. Highbrook Precinct Transportation Plan

(1) As part of the first stage of development (excluding bulk earthworks), a Transportation Plan must be prepared by a suitably qualified transportation professional to outline:

(a) how the future residents will access the wider area, including pedestrian linkages, cycle linkages, and public transport modes.
(b) how the provision of a private shuttle bus within the Precinct will be implemented to enable connections to key public transport nodes, town centres or key destinations.

I4.6.3. Upgrading of shared cycle / pedestrian path and pedestrian barrier

(1) As part of the first stage of development (excluding bulk earthworks), the following transport infrastructure upgrades must be completed to Auckland Transport Design Standards:

(a) the area identified as shared pathway to be upgraded on Precinct Plan 1.
(b) the installation of a pedestrian barrier within the area shown on Precinct Plan 1

I4.6.4. Construction of a bus stop

(1) As part of the first stage of development (excluding bulk earthworks), a bus stop must be constructed along the Precinct frontage with Highbrook Drive. The location of the bus stop is to be confirmed in consultation with Auckland Transport.

I4.6.5. Road noise attenuation

(1) Any new building or alterations to existing buildings containing an activity sensitive to noise must be designed, constructed and maintained to not exceed 40 dB LAeq (24 hour) for all noise sensitive spaces.

(2) If windows must be closed to achieve the design noise levels in I4.6.5(1), the building must be designed, constructed and maintained with a mechanical ventilation system for noise sensitive spaces, to achieve the following requirements:

(a) an internal temperature no greater than 25 degrees celsius based on external design conditions of dry bulb 25.1 degrees celsius and wet bulb 20.1 degrees Celsius; or

Note:

Mechanical cooling must be provided for all habitable rooms (excluding bedrooms) provided that at least one mechanical cooling system must service every level of a dwelling that contains a habitable room (including bedrooms)

(b) a high volume of outdoor air supply to all habitable rooms with an indoor air supply rate of no less than:

- six air changes per hour (ACH) for rooms with less than 30 percent of the façade area glazed; or
- 15 air changes per hour (ACH) for rooms with greater than 30 percent of the façade area glazed; or

- three air changes per hour for rooms with facades only facing south (between 120 degrees and 240 degrees) or where the glazing in the façade is not subject to any direct sunlight.

(c) For all other noise sensitive spaces provide mechanical cooling to achieve an internal temperature no greater than 25 degrees celsius based on external design conditions of dry bulb 25.1 degrees celsius and wet bulb 20.1 degrees celsius; and

(d) provide relief for equivalent volumes of spill air; and

(e) be individually controlled across the range of airflows and temperatures by the building occupants in the case of each system; and

(f) Have a mechanical ventilation and/or cooling system that generates a noise level no greater than LAeq 35 dB when measured 1m from the diffuser at the minimum air flows required to achieve the design temperatures and air flows in Standard 2(a) and (b) above.

(3) A report must be submitted by a suitably qualified and experienced person to the council demonstrating that compliance with I4.6.5(1) and (2) can be achieved prior to the construction or alteration to any building containing an activity sensitive to noise.

I4.7. Assessment – controlled activities

There are no controlled activities in this precinct.

I4.8. Assessment – restricted discretionary activities

I4.8.1. Matters of discretion

The Council will restrict its discretion to all of the following matters when assessing a restricted discretionary activity, in addition to the matters specified for the relevant restricted discretionary activities in the overlay, Auckland-wide and zone provisions.

(1) Non-compliance with Standard I4.6.5 – Road noise attenuation

(a) The effects on people's health and residential amenity
(b) The location of the building
(c) Topographical or building design features that will mitigate noise effects.

I4.8.2. Assessment criteria

The council will consider the relevant assessment criteria below for restricted discretionary activities, in addition to the assessment criteria specified for the restricted discretionary activities in the overlay, Auckland-wide and zone provisions.

(1) Non-compliance with Standard I4.6.5 – Road noise attenuation:

(a) Whether the building accommodating activities sensitive to noise is located or designed to achieve protection from adverse health and amenity effects.
(b) The extent to which alternative mitigation measures to manage the effects of non-compliance on the health and amenity of the occupants.

(2) Transport matters

(a) Prior to the occupation of the first dwelling, the extent to which the provision of a private shuttle bus between the Highbrook Precinct and the nearby public transport hubs, town centres or key destinations is implemented, including consideration of the following matters:

- Is privately funded, operated, managed and, where not provided directly by the developer, is secured through an appropriate legal mechanism such as (but not limited to) a Body Corporate or Residents' association to ensure an effective level of service.
- Achieves the intended purpose of encouraging behaviour change from private vehicles and towards public transport.
- Takes into consideration of other public transport options and alternative transport modes made available in the surrounding area.
- Takes into consideration the Highbrook Precinct Transportation Plan.

I4.9. Special information requirements

There are no special information requirements in this precinct.

I4.10. Precinct plans

I4.10.1. Highbrook Precinct Plan 1

APPENDIX 7

REVISED PLAN CHANGE REQUEST DECEMBER 2022

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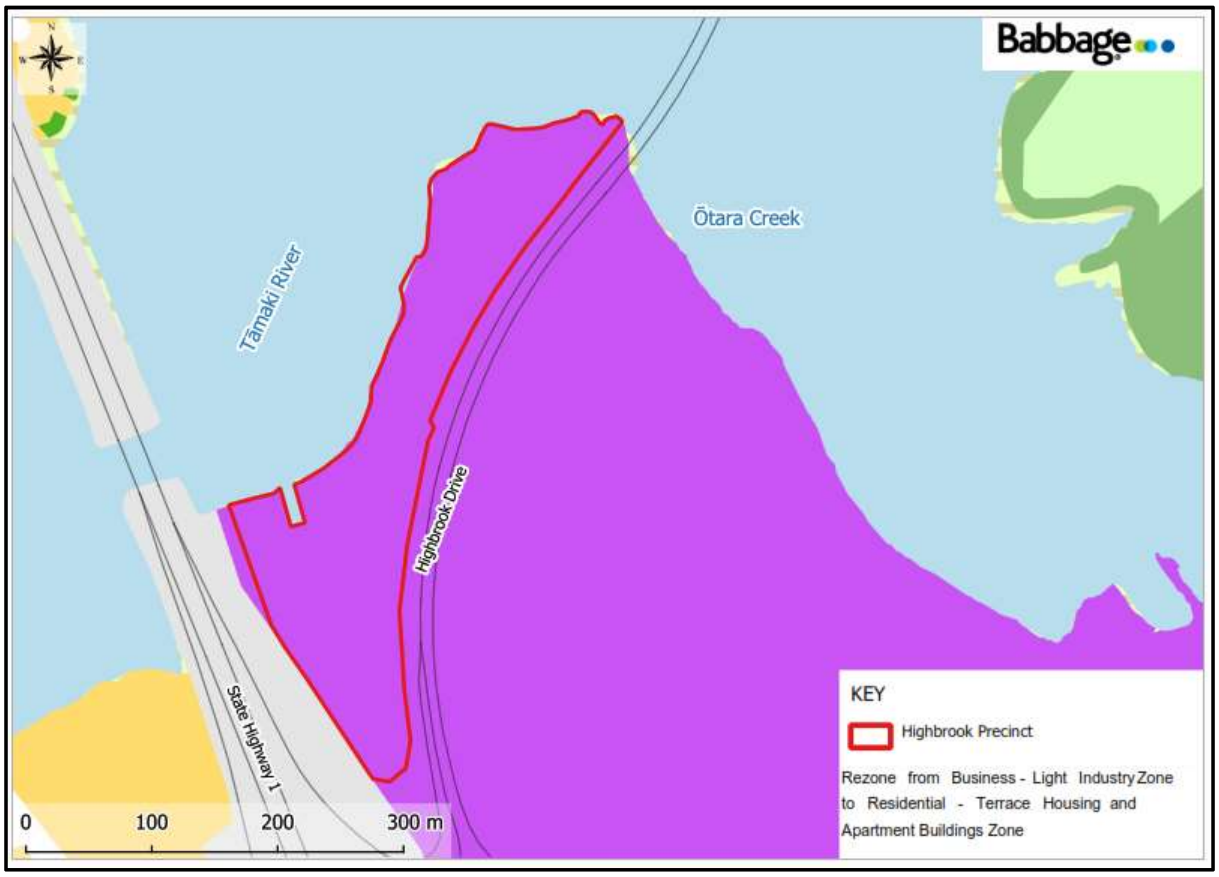

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I4.10.1. Highbrook Precinct Plan 1