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

Date: Tuesday 13 July and Wednesday 14 July 2021
Time: 9.30am
Meeting Room: Reception Lounge
Venue: Level 2, Auckland Town Hall,
301-303 Queen Street, Auckland Central

HEARING REPORT – VOLUME TWO
NOTICE OF REQUIREMENT
DESIGNATION 6302 NORTH ISLAND MAIN
TRUNK RAILWAY LINE
KIWIRAIL

COMMISSIONERS

Chairperson	Peter Reaburn
Commissioners	David Wren
	Nigel Mark-Brown

Bevan Donovan
HEARINGS ADVISOR

Telephone: 09 890 8056 or 021 325 837
Email: bevan.donovan@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 procedure for a hearing 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 Requiring Authority (the applicant) will be called upon to present their case. The Requiring Authority may be represented by legal counsel or consultants and may call witnesses in support of the application. After the Requiring Authority 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 **requiring authority** or their representative then has the right to summarise the application and reply to matters raised. Hearing panel members may further question the applicant. The applicants reply may be provided in writing after the hearing has adjourned.
- **The chairperson** will outline the next steps in the process and adjourn or close the hearing.
- The hearing panel will make a recommendation to the Requiring Authority. The Requiring Authority then has 30 working days to make a decision and inform council of that decision. You will be informed in writing of the Requiring Authority's decision, the reasons for it and what your appeal rights are.

**A LIMITED NOTIFIED NOTICE OF REQUIREMENT TO THE AUCKLAND COUNCIL
UNITARY PLAN BY KIWIRAIL**

TABLE OF CONTENTS – VOLUME ONE		PAGE NO.
Reporting officer’s report		5 - 74
Attachment Two	Section 92 Requests and KiwiRail’s response	505 - 754
Attachment Three	Specialist Reviews	755 - 800
Attachment Four	Notification Report	801 - 838
Attachment Five	Submissions and Local Board views	839 - 888
Attachment Six	Information from KiwiRail – heritage matters	889 - 904
Attachment Seven	Recommended conditions	905 - 912
TABLE OF CONTENTS – VOLUME TWO		PAGE NO.
Attachment One	Lodgement Documents	75 - 504

Vanessa Leddra, Planner

Reporting on proposed Notice of Requirement to Designation 6302 seeking to alter the existing North Island Main Trunk line designation. This alteration is associated with and supports the delivery of works as part of the Wiri to Quay Park project by KiwiRail. The NoR addresses works on land adjacent to but outside the existing rail corridor. Land is required for construction activities and permanent occupation by rail infrastructure. The alteration to the designation includes land along the rail corridor at Middlemore Station, Mangere East, Bridge Street/ Puhinui Station, Manukau and Wiri.

REQUIRING AUTHORITY: KIWIRAIL

SUBMITTERS AND LOCAL BOARD VIEWS:	
Page 841	Auckland Transport
Page 855	Watercare Services Limited
Page 865	Counties Manukau District Health Board
Page 869	Brujen Holdings Limited
Page 873	The Accident Compensation Corporation
Page 881	Waka Kotahi NZ Transport Agency
Page 885	Māngere-Ōtāhuhu Local Board views
Page 887	Ōtara-Papatoetoe Local Board views

ATTACHMENT ONE
LODGEMENT DOCUMENTS

14 July 2020

Attention: Vanessa Leddra
Plans and Places – Auckland Council
135 Albert Street
AUCKLAND CENTRAL

Project Name: Wiri to Quay Park
Project Number: IA233800

Subject: Notice of Requirement for Wiri to Quay Park Project

Dear Vanessa

Please find attached the Notice of Requirement (NoR) to alter the existing North Island Main Trunk line designation (Auckland Unitary Plan Reference 6302). This alteration is associated with the Wiri to Quay Park project by KiwiRail Holdings Limited (KiwiRail). As previously discussed, this NoR addresses works outside the existing rail corridor between Middlemore Station and Wiri. Enclosed with this NoR is a supporting assessment of effects on the environment, a range of supporting technical reports and land requirement plans. Future resource consent applications and an Outline Plan will be sought for both these works and those inside the existing rail corridor.

The assessment of effects on the environment fully details the location of the proposed works, their purpose, the anticipated effects of the project's construction and operation, consultation undertaken (and ongoing), an assessment against all relevant statutory documents and an assessment of alternatives in accordance with the Resource Management Act 1991.

Please note that all fees and associated billing for the NoR are to be directed to Michelle Grinlinton-Hancock at KiwiRail.

Yours sincerely



Tim Hegarty
Associate Planner
Tim.Hegarty@jacobs.com

Copy to: Michelle Grinlinton-Hancock - KiwiRail

6302 North Island Main Trunk Railway Line

Designation Number	6302
Requiring Authority	KiwiRail Holdings Ltd
Location	North Island Main Trunk Railway Line from Buckland to Britomart Station, Auckland Central
Rollover Designation	Yes
Legacy References	Designation 89, Auckland Council District Plan (Franklin Section) 2000; Designation 11, Auckland Council District Plan (Papakura Section) 1999; Designation 230, Auckland Council District Plan (Manukau Section) 2002; Designation B10-05, Auckland Council District Plan (Isthmus Section) 1999; Designation 282, Auckland Council District Plan (Central Area Section) 2005
Lapse Date	Given effect to (i.e. no lapse date)

Purpose

The purpose of the designation is to develop, operate and maintain railways, railway lines, railway infrastructure, and railway premises as defined in the Railways Act 2005.

Conditions

The following conditions apply between points X: 1,763,282.256m Y: 5,909,226.484m and X: 1,758,983.051m Y: 5,920,480.938m (NZTM2000):

1. Any activity on land within the defined Tamaki Drive Scenic Way (Map Reference B10-08) shall comply with the Auckland City Design Guidelines Tamaki Drive.
2. The geological feature which is scheduled in the District Plan (Map Reference D12-04) shall not be excavated, physically investigated, damaged, or altered, other than in accordance with an outline plan submitted and processed in terms of Section 176A of the Resource Management Act 1991.
3. Where the Purewa Tunnel passes under the following properties, the designation applies to subsoil space only:
 - Lot 416, DP 41185;
 - Lot 1, DP 74916;
 - Lot 2, DP 74916;
 - Part Lot 2, DP 40127;
 - Part Lot 1, DP 40127;
 - Part Lot 22, DP 18321; and
 - Part Lot 19, DP 18321.

For these properties, the extent of the designation is limited to the subsoil space owned by the requiring authority and recorded on the certificates of title. The location of these properties and the strata nature of the designation is illustrated in Diagram B10-05(1).

4. Where the Purewa Tunnel passes under St Johns Road, the extent of the designation is limited to the subsoil space owned by the requiring authority and recorded on Survey Office Plan 22701. The

location of this road in relation to the tunnel and the strata nature of the designation is illustrated in Diagram B10-05(1).

The following conditions apply between points XL 1,758,983.051m Y: 5,920,480.938m and X: 1,757,893.28m Y: 5,920,853.469m (NZTM2000):

5. With exception of the temporary station site, the designation (for existing and future corridors) is limited as to airspace at 6m above the rail tracks and the future corridor to the Britomart Transport Centre is limited to both airspace and substrata as shown in the Diagram 282.

6. Development of the temporary station site shall comply with the underlying development controls.

Attachments

Diagram B10-05 - Purewa Tunnel Strata

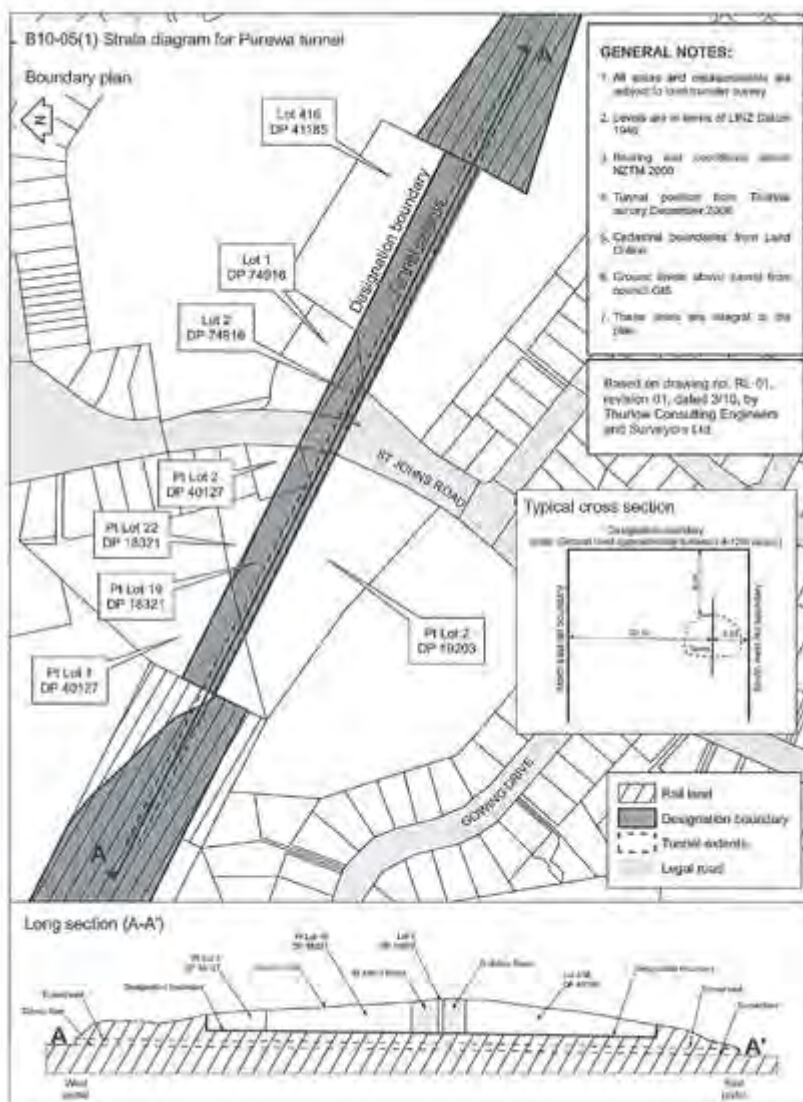
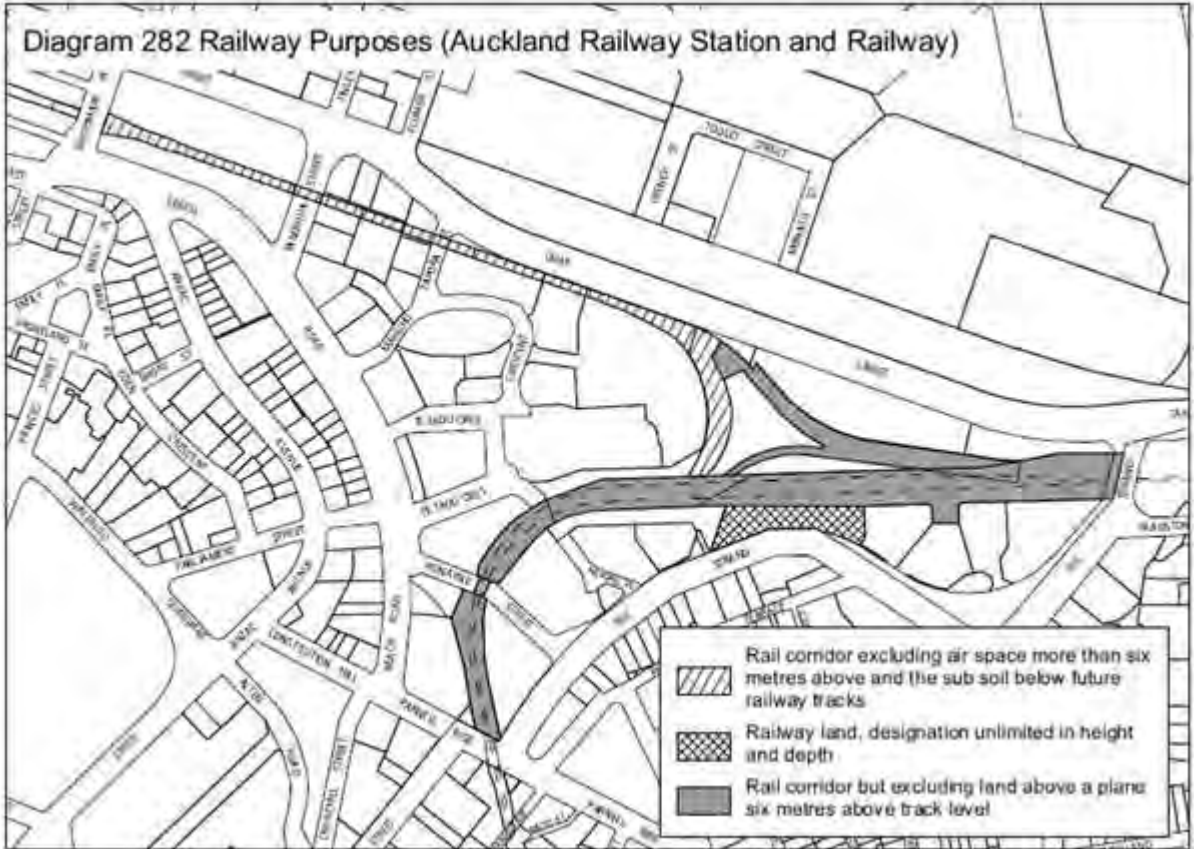


Diagram 282 - Auckland Railway Station and Railway Designation Heights

Diagram 282 Railway Purposes (Auckland Railway Station and Railway)





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA35D/1250**
Land Registration District **North Auckland**
Date Issued 01 March 1977

Prior References

NA1072/147 NA1377/65 NA1394/76
NA2074/29 NA649/27

Estate Fee Simple
Area 20.0832 hectares more or less
Legal Description Lot 240-241 Deposited Plan 43645, Part
Lot 13 Deposited Plan 2989, Allotment
237 Parish of Manurewa and Section
12-14, Section 37 and Part Section 11
Block VI Otahuhu Survey District

Registered Owners

Counties Manukau District Health Board

Interests

Subject to a electricity right (in gross) over part in favour of the Auckland Electric Power Board created by Transfer A251575 (affects Lot 240 DP 43645)

Subject to Section 8 Coal Mines Amendment Act 1950 (affects Allotment 237 Parish of Manurewa)

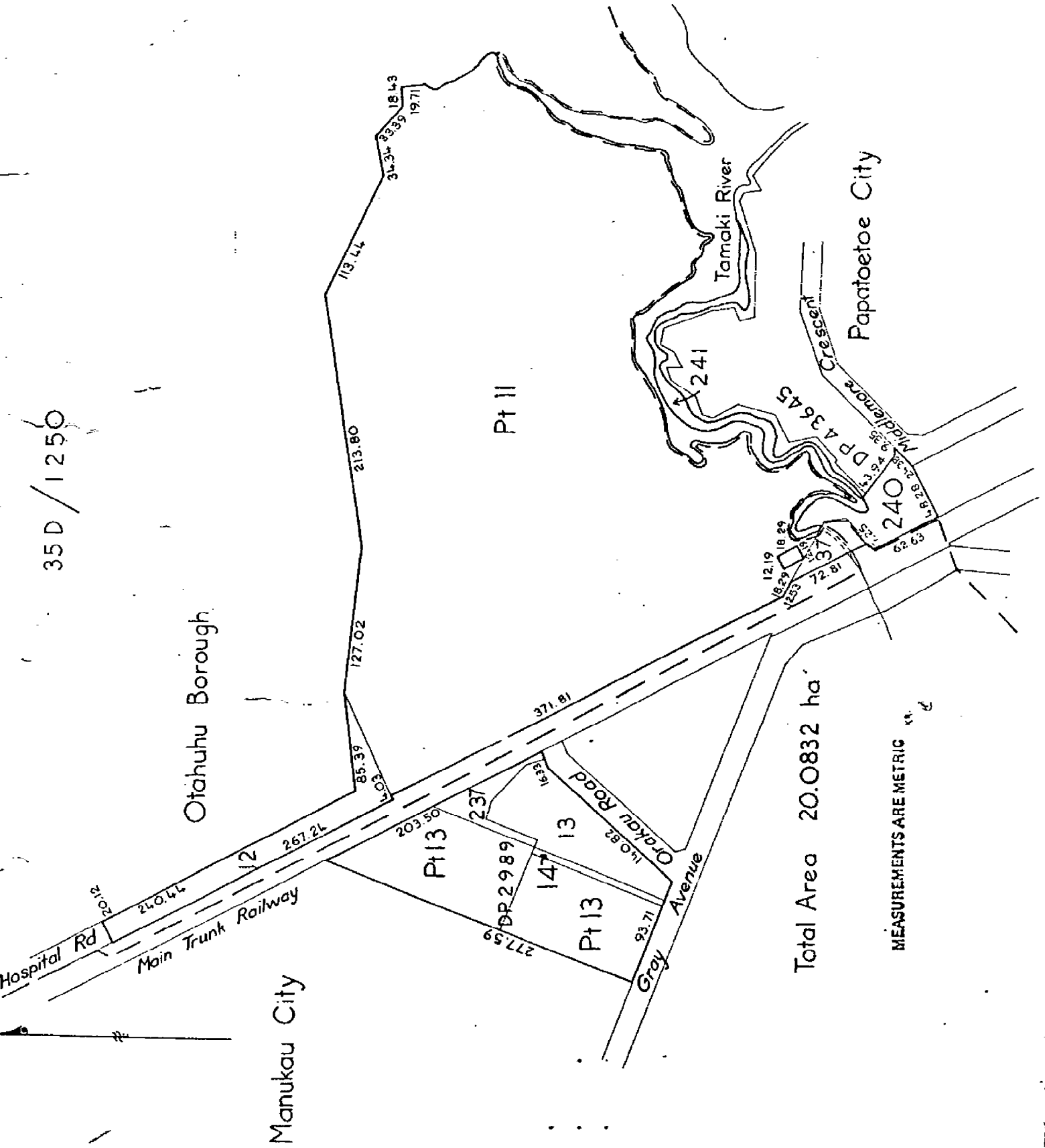
Subject to a electricity right (in gross) over part marked A in favour of the Auckland Electric Power Board created by Transfer 555296.1 - 15.3.1978 at 2.09 pm

C688327.1 CAVEAT BY MANUKAU HEALTH LIMITED - 1.12.1994 AT 2.24 PM

Subject to a right (in gross) to convey electricity over parts marked A, D and F over part Section II Block VI Otahuhu SD, parts marked B and E Section 12 Block VI Otahuhu SD, part marked C Section 37 Block VI Otahuhu SD DP 471945 in favour of Vector Limited created by Easement Instrument 9719690.1 - 26.5.2014 at 11:36 am

9918192.1 Certificate under section 148 of the Nga Mana Whenua o Tamaki Makaurau Collective Redress Act 2014 that the within land is RFR land as defined in section 118 and is subject to Subpart 1 of Part 4 of the Act (which restricts disposal, including leasing of the land) - 5.12.2014 at 7:00 am

35D / 1250



Total Area 20.0832 ha

MEASUREMENTS ARE METRIC



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA82C/132
Land Registration District North Auckland
Date Issued 02 August 1990

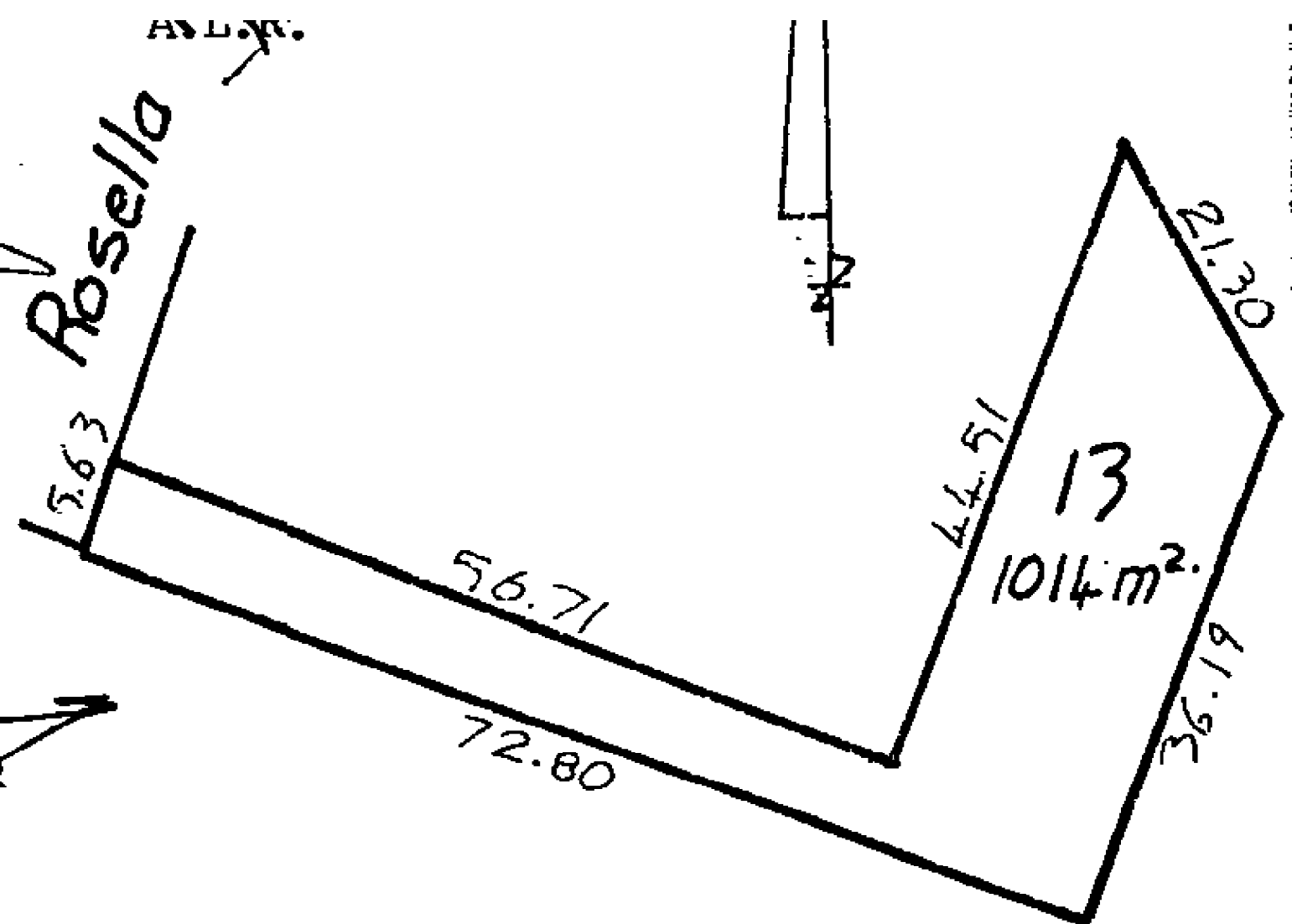
Prior References
PROC 14916

Estate Fee Simple
Area 1014 square metres more or less
Legal Description Lot 13 Deposited Plan 19404

Registered Owners
Hayanek Properties Limited

Interests

10459781.3 Mortgage to ASB Bank Limited - 16.6.2016 at 5:35 pm





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA90C/848
Land Registration District North Auckland
Date Issued 27 April 1993

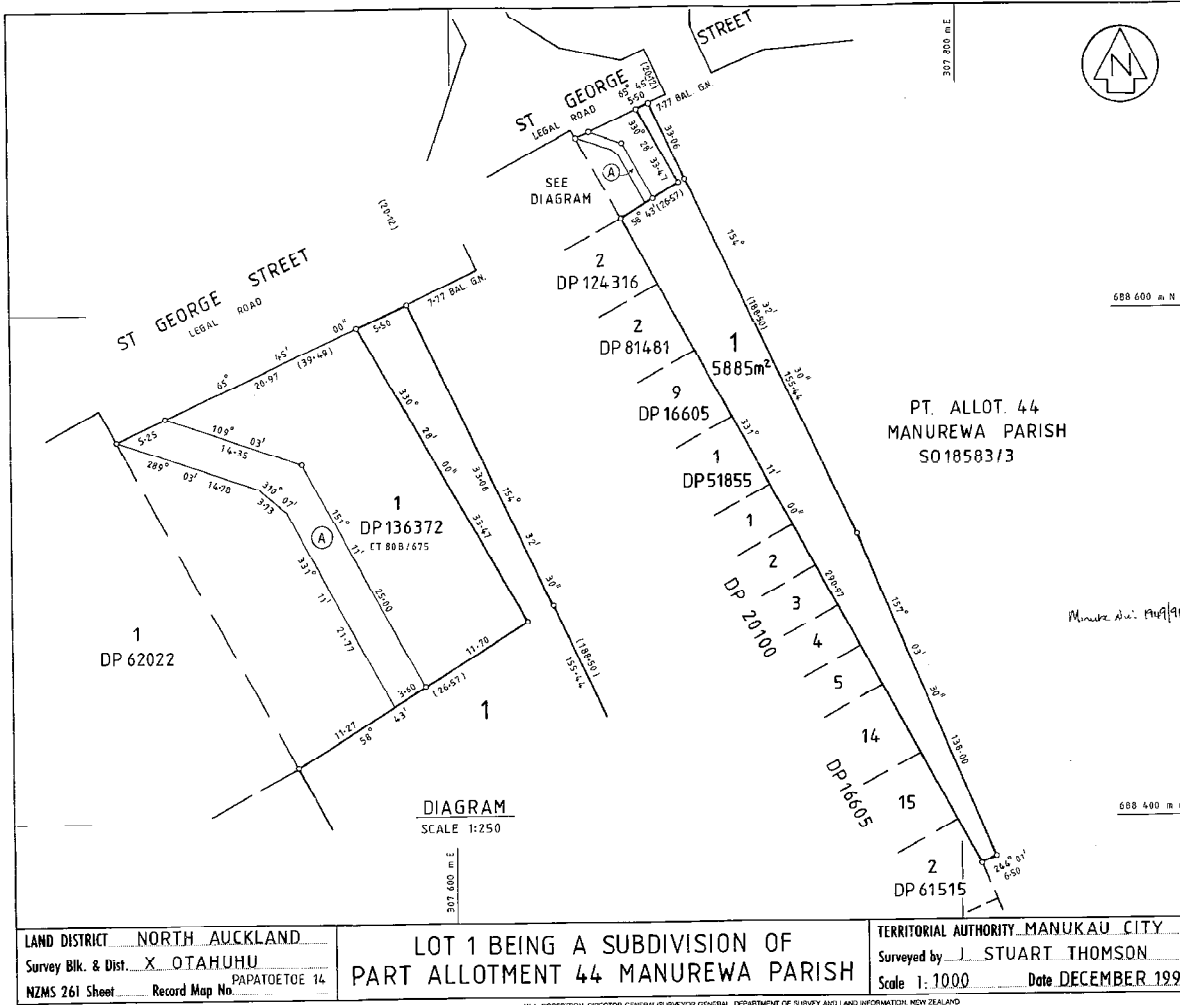
Prior References
GN B474007.1

Estate Fee Simple
Area 5885 square metres more or less
Legal Description Lot 1 Deposited Plan 152288

Registered Owners
Brujen Holdings Limited

Interests

Appurtenant hereto is a right of way created by Transfer C474454.3 - 27.4.1993



Approvals
 APPROVED FOR AND ON BEHALF OF H.M. THE QUEEN PURSUANT TO SECTION 10(3) RAILWAYS CORPORATION ACT 1981.

[Signature]
 MANAGER TECHNICAL SERVICES
 N.Z. RAILWAYS CORPORATION

[Signature]
 for and on behalf of

THE PRESBYTERIAN CHURCH PROPERTY TRUSTEES
 THE MANUKAU CITY COUNCIL APPROVES THIS COPY DATED 27th JANUARY 1992 THIS SURVEY PLAN PURSUANT TO SECTION 305 OF THE LOCAL GOVERNMENT ACT 1974 HEREBY CERTIFIES THAT THE SURVEY PLAN IS IN ACCORDANCE WITH THE REQUIREMENTS AND PROVISIONS OF THE OPERATIVE DISTRICT SCHEME AND PROPOSED NEW DISTRICT SCHEME FOR THE AREA TO WHICH THE SURVEY PLAN RELATES AND ACCORDINGLY THE COMMON SEAL OF THE MANUKAU CITY COUNCIL WAS HERETO AFFIXED IN THE PRESENCE OF:

[Signature]
 H. S. ROBERTS

SIGNATURES UNDER DELEGATED AUTHORITY
[Signature]
 R. W. GOW

SCHEDULE OF PROPOSED EASEMENT			
PURPOSE	SHOWN	SERVIENT TENEMENT	DOMINANT TENEMENT
RIGHT OF WAY	(A)	LOT 1 DP136372	LOT 1 HEREDON

NEW C.T. ALLOCATED:
 LOT 1 - 90C/848

Total Area 5885m²

Comprised in PART GN B474-002/1 AND C.T. 805/675 EASEMENT ONLY.

L. JAMES STUART THOMPSON, SURVEYOR, AUCKLAND.
 Registered Surveyor and holder of an annual practicing certificate for who may act as a registered surveyor pursuant to section 25 of the Survey Act 1985 hereby certifies that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1972 or any regulations made in accordance therewith.

Dated at AUCKLAND, this 17th day of DECEMBER 1991. *[Signature]*

Field Book p. Traverse Book p.
 Reference Plans

Examined Correct *[Signature]*

Approved as to Survey
 24.1.1992 *[Signature]*
 Chief Surveyor

Deposited this 27th day of April 1993
[Signature]
 District Land Registrar

File No. 152288
 Received 17.12.92
 District

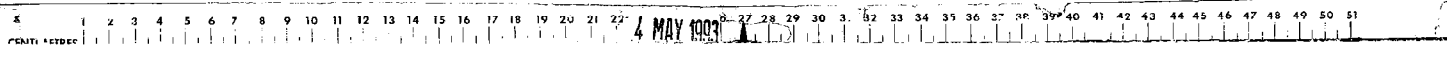
LAND DISTRICT NORTH AUCKLAND
 Survey Blk. & Dist. X OTAHUHU
 NZMS 261 Sheet Record Map No. PAPATOETOE 14

LOT 1 BEING A SUBDIVISION OF
 PART ALLOTMENT 44 MANUREWA PARISH

TERRITORIAL AUTHORITY MANUKAU CITY
 Surveyed by J. STUART THOMPSON
 Scale 1:1000 Date DECEMBER 1991

DP 152288

W.A. HOBBS/SON DIRECTOR GENERAL/SURVEYORS GENERAL, DEPARTMENT OF SURVEY AND LAND INFORMATION, NEW ZEALAND





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/698**
Land Registration District **North Auckland**
Date Issued 23 October 1986

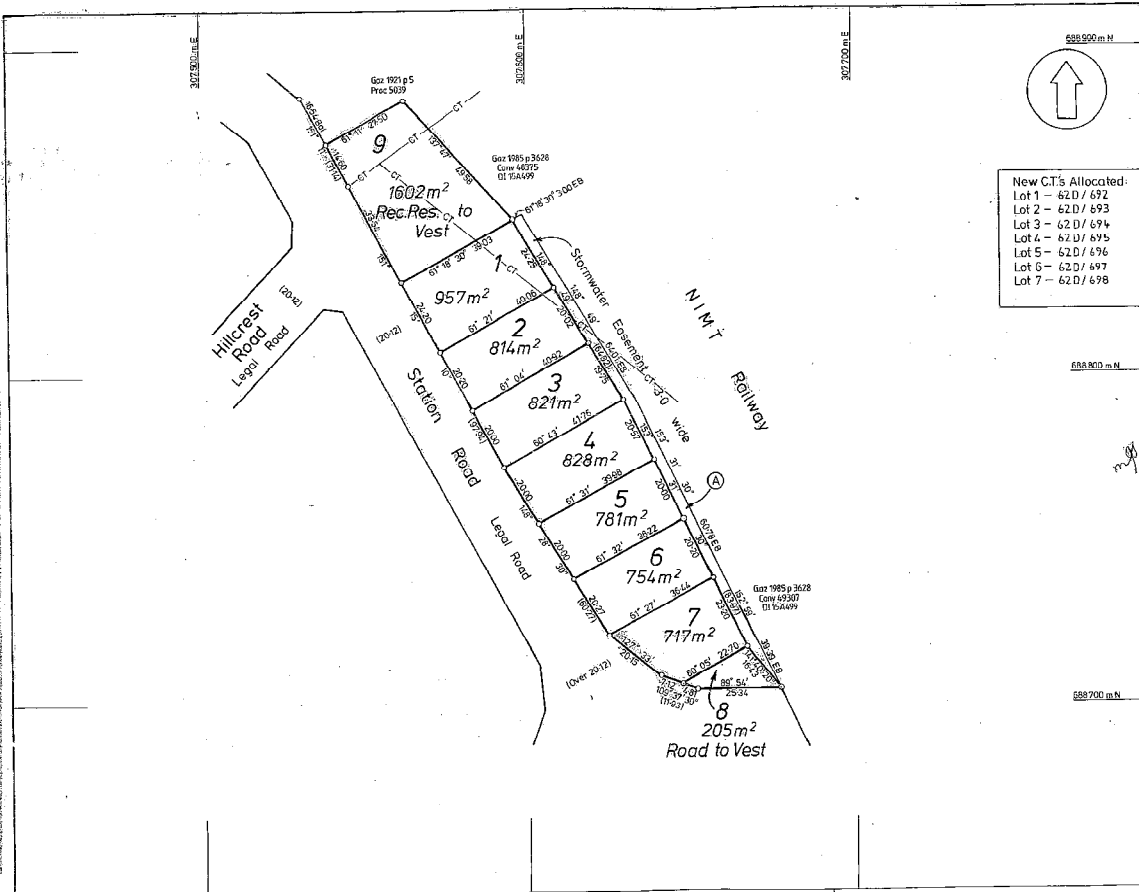
Prior References
GN B474007.1

Estate Fee Simple
Area 717 square metres more or less
Legal Description Lot 7 Deposited Plan 111628

Registered Owners
Teresa Lyndsay Marene Davis

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11.32 am
11569799.3 Mortgage to ASB Bank Limited - 4.10.2019 at 5:18 pm



New CT's Allocated:

- Lot 1 - 62D/692
- Lot 2 - 62D/693
- Lot 3 - 62D/694
- Lot 4 - 62D/695
- Lot 5 - 62D/696
- Lot 6 - 62D/697
- Lot 7 - 62D/698

For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross

Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7.

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. Ward
Mayor

[Signature]
Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of February, 1986. Signature *[Signature]*

Field Book p. Traverse B66 p. p.

Reference Plans DP 38080, DP 80536, SO 18583, SO 21091, SO 50470, SO 55794, SO 55795.

Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*

2.7.86 *[Signature]* Surveyor

Deposited this 23 day of July 1986

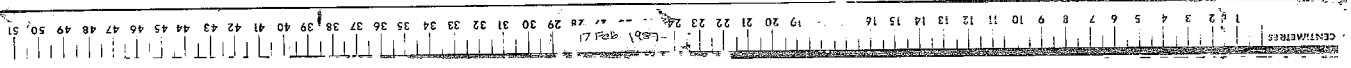
File Received 24 MAR 1986
 1986

File DP-111628

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET NO. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/697**
Land Registration District **North Auckland**
Date Issued 23 October 1986

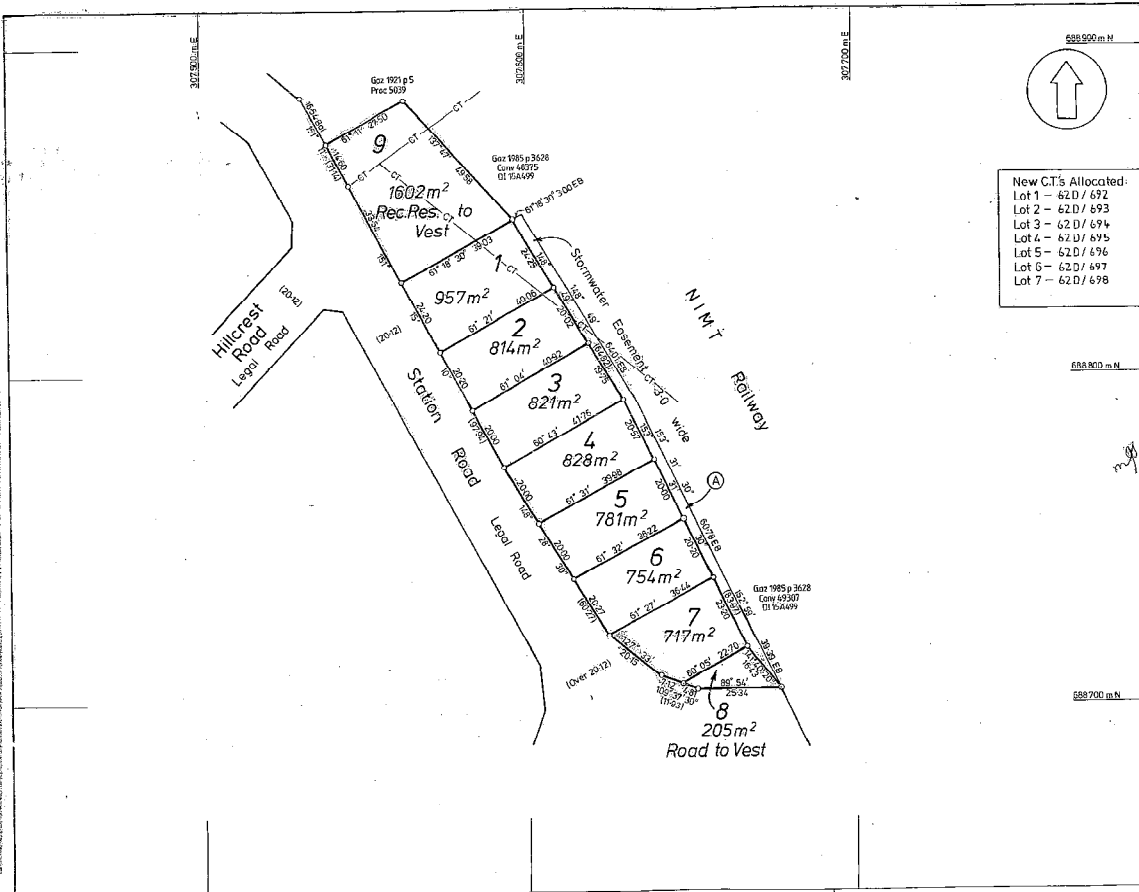
Prior References
GN B474007.1

Estate Fee Simple
Area 754 square metres more or less
Legal Description Lot 6 Deposited Plan 111628

Registered Owners
Sialele Tafeaga and Violeta Tafeaga

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11:32 am
8499872.2 Mortgage to Bank of New Zealand - 21.5.2010 at 2:43 pm



New CT's Allocated:

- Lot 1 - 62D/692
- Lot 2 - 62D/693
- Lot 3 - 62D/694
- Lot 4 - 62D/695
- Lot 5 - 62D/696
- Lot 6 - 62D/697
- Lot 7 - 62D/698

For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross

Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. Hume Logan
Mayor

[Signature]
Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of December, 1986. Signature *B.H. Logan*

Field Book p. Traverse B66 p. p.

Reference Plans DP 28080, DP 80536, SO 18583, SO 21001, SO 50470, SO 55794, SO 55795.

Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*

2.7.86 Surveyor

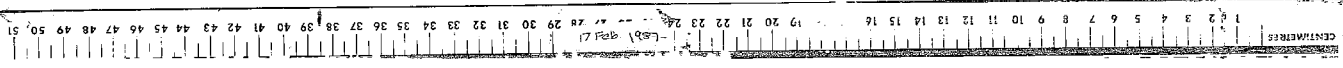
Deposited this 23 day of July 1986

File Received 24 MAR 1986
 D.P. 111628

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/696**
Land Registration District **North Auckland**
Date Issued 23 October 1986

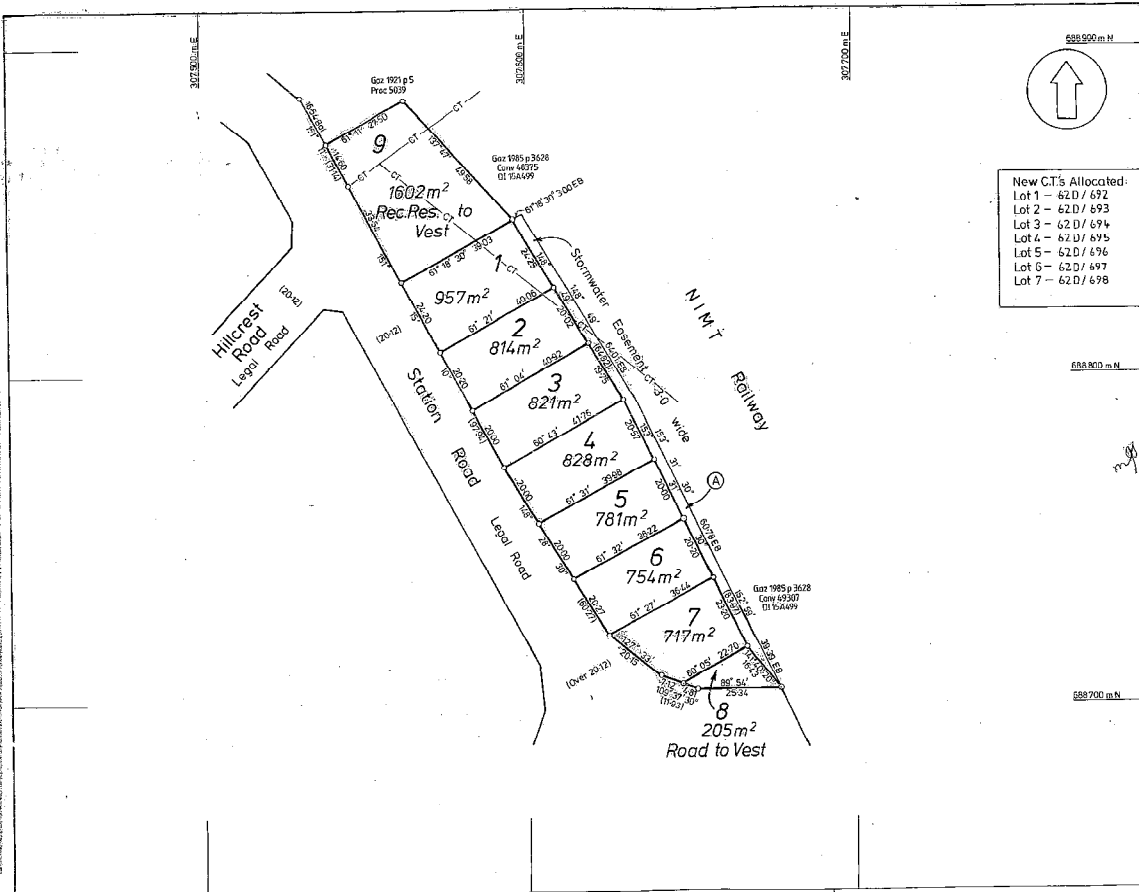
Prior References
GN B474007.1

Estate Fee Simple
Area 781 square metres more or less
Legal Description Lot 5 Deposited Plan 111628

Registered Owners
A A Chandra Investments Limited

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11:32 am
9486503.3 Mortgage to Bank of New Zealand - 23.8.2013 at 2:04 pm



New CT's Allocated:

- Lot 1 - 62D/692
- Lot 2 - 62D/693
- Lot 3 - 62D/694
- Lot 4 - 62D/695
- Lot 5 - 62D/696
- Lot 6 - 62D/697
- Lot 7 - 62D/698

For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross

Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. H. Logan
Mayor

[Signature]
Town Clerk

Total Area 7479m²
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of February, 1986. Signature *[Signature]*

Field Book p. Traverse B66 p. p.
 Reference Plans DP 38080, DP 80536, SO 18583, SO 21001, SO 50470, SO 55794, SO 55795.

Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*

2.7.86 *[Signature]* Surveyor

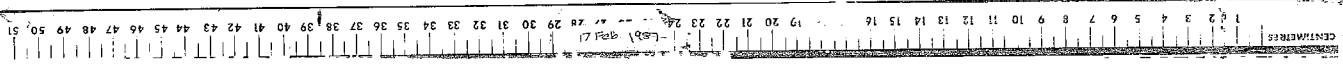
Deposited this 23 day of February 1986

File Received 24 MAR 1986
 D.P. 111628

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/695**
Land Registration District **North Auckland**
Date Issued 23 October 1986

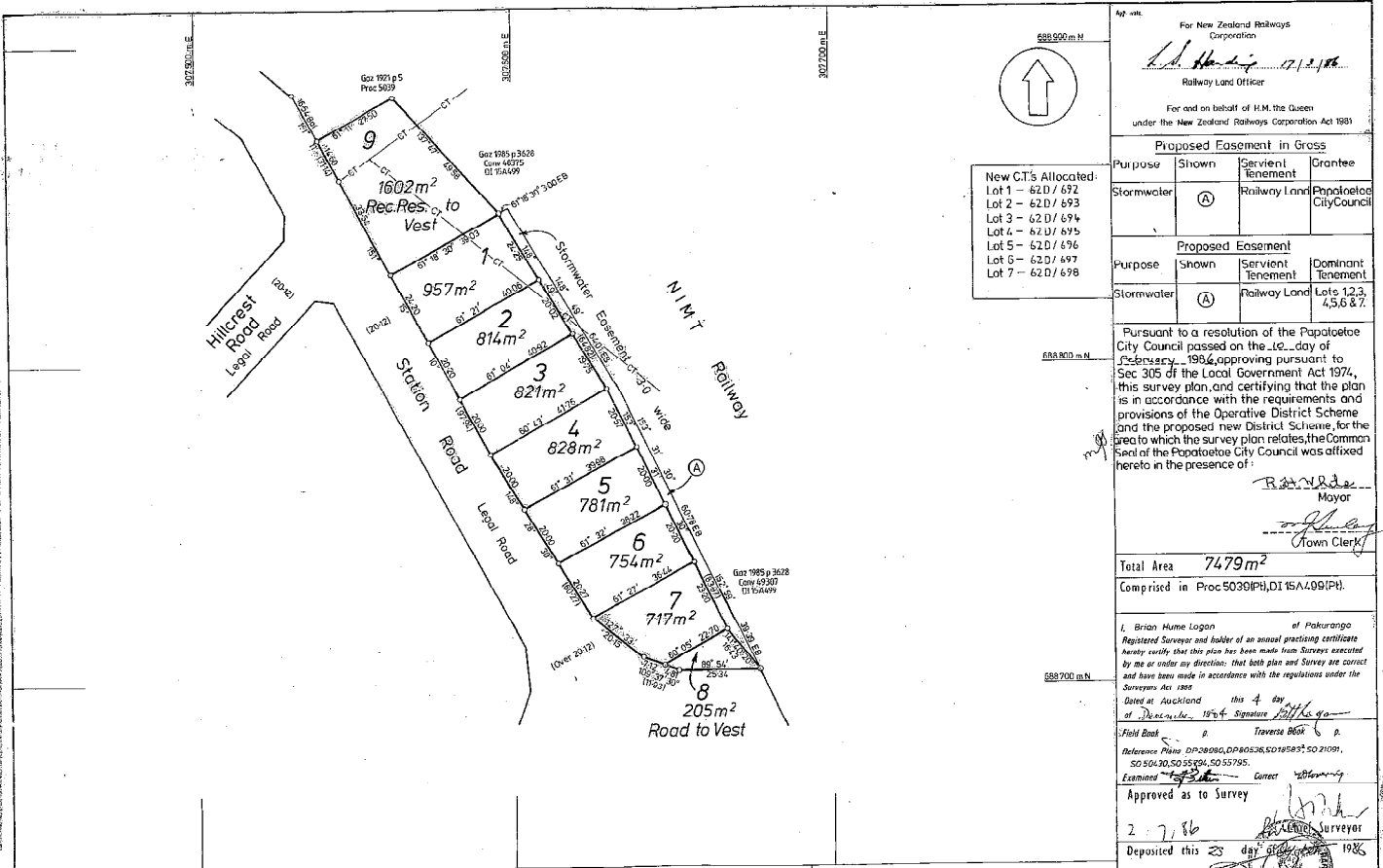
Prior References
GN B474007.1

Estate Fee Simple
Area 828 square metres more or less
Legal Description Lot 4 Deposited Plan 111628

Registered Owners
Kiriheke Ruke

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11.32 am
B941283.2 Mortgage to Post Office Bank Limited - 17.1.1989 at 11.40 am



For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross

Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. W. R. de
Mayor

[Signature]
Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of February, 1986. Signature *[Signature]*

Field Book p. Traverse B66 p. p.

Reference Plans DP 38080, DP 80536, SO 18583, SO 21001, SO 50470, SO 55794, SO 55795.

Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*

2.7.86 *[Signature]* Surveyor

Deposited this 23 day of February 1986

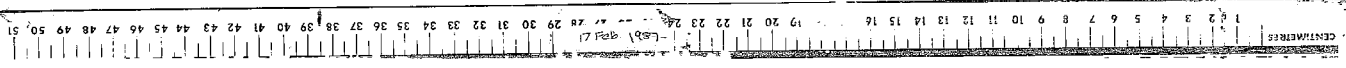
File Received 24 MAR 1986
 District Registrar

File No. DP-111628

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/694**
Land Registration District **North Auckland**
Date Issued 23 October 1986

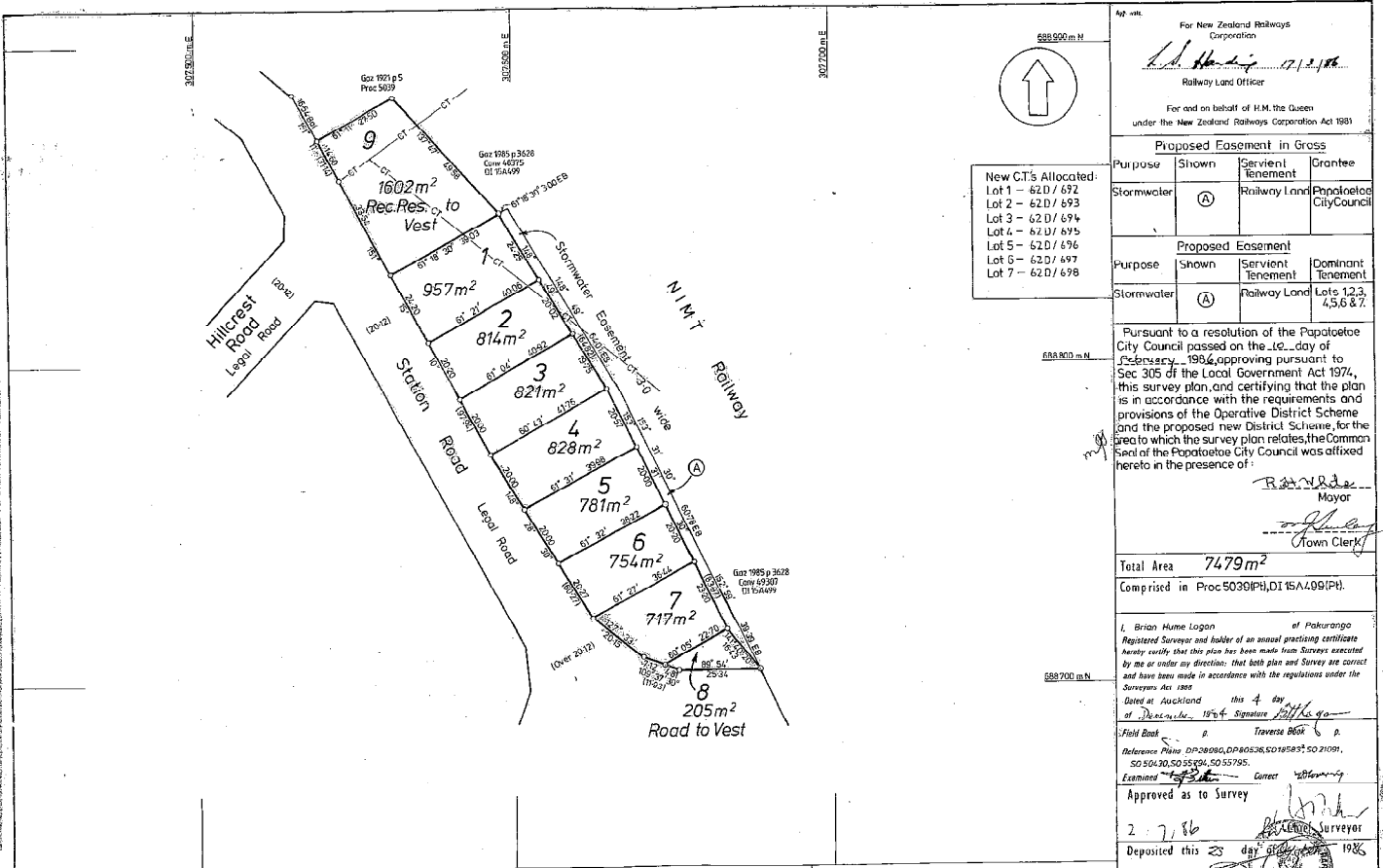
Prior References
GN B474007.1

Estate Fee Simple
Area 821 square metres more or less
Legal Description Lot 3 Deposited Plan 111628

Registered Owners
Phillip Keith Taylor and SWL Trustee Company Limited

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11:32 am
11120025.2 Mortgage to Westpac New Zealand Limited - 15.6.2018 at 3:27 pm



New CT's Allocated:
 Lot 1 - 62D/692
 Lot 2 - 62D/693
 Lot 3 - 62D/694
 Lot 4 - 62D/695
 Lot 5 - 62D/696
 Lot 6 - 62D/697
 Lot 7 - 62D/698

For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross			
Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement			
Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1984, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. Ward
 Mayor
[Signature]
 Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

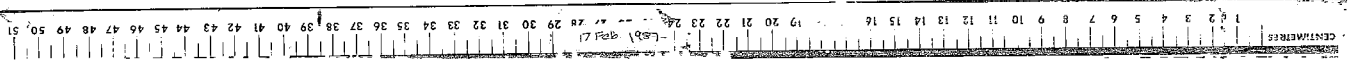
I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985
 Dated at Auckland this 4 day of December, 1984. Signature *[Signature]*
 Field Book p. Traverse B66 p. p.
 Reference Plans DP 28080, DP 80536, SO 18583, SO 21091, SO 50470, SO 55794, SO 55795.
 Examined *[Signature]* Correct *[Signature]*
 Approved as to Survey *[Signature]*
 2. 7. 86 Surveyor
 Deposited this 23 day of July 1986
 Registrar

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985

File No. 24 HAR 1986
 D.P. 111628





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/693**
Land Registration District **North Auckland**
Date Issued 23 October 1986

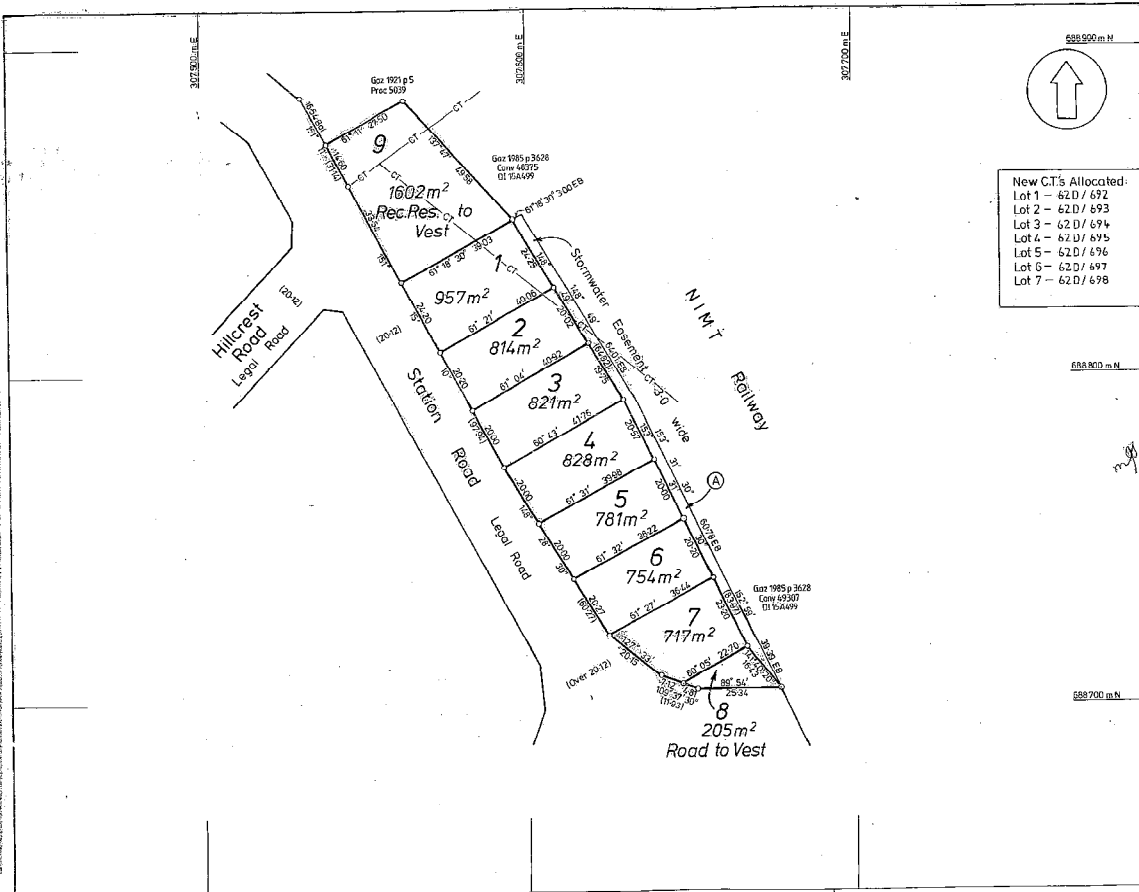
Prior References
GN B474007.1

Estate Fee Simple
Area 814 square metres more or less
Legal Description Lot 2 Deposited Plan 111628

Registered Owners
Phillip Keith Taylor and SWL Trustee Company Limited

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11:32 am
10577513.3 Mortgage to Westpac New Zealand Limited - 3.2.2017 at 9:59 am



New CT's Allocated:
 Lot 1 - 62D/692
 Lot 2 - 62D/693
 Lot 3 - 62D/694
 Lot 4 - 62D/695
 Lot 5 - 62D/696
 Lot 6 - 62D/697
 Lot 7 - 62D/698

For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross			
Purpose	Shown	Servient Tenement	Grantee
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement			
Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. W. R. de
Mayor

[Signature]
Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of February, 1986. Signature *[Signature]*

Field Book p. Traverse B66 p. p.
 Reference Plans DP 28080, DP 80536, SO 18583, SO 21001, SO 50470, SO 55794, SO 55795.
 Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*
 2. 7. 86 Surveyor

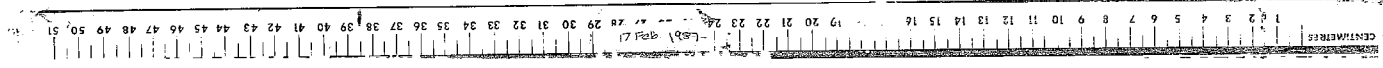
Deposited this 23 day of February 1986

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985

File No. 24 MAR 1986
 DP-111628





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA62D/692**
Land Registration District **North Auckland**
Date Issued 23 October 1986

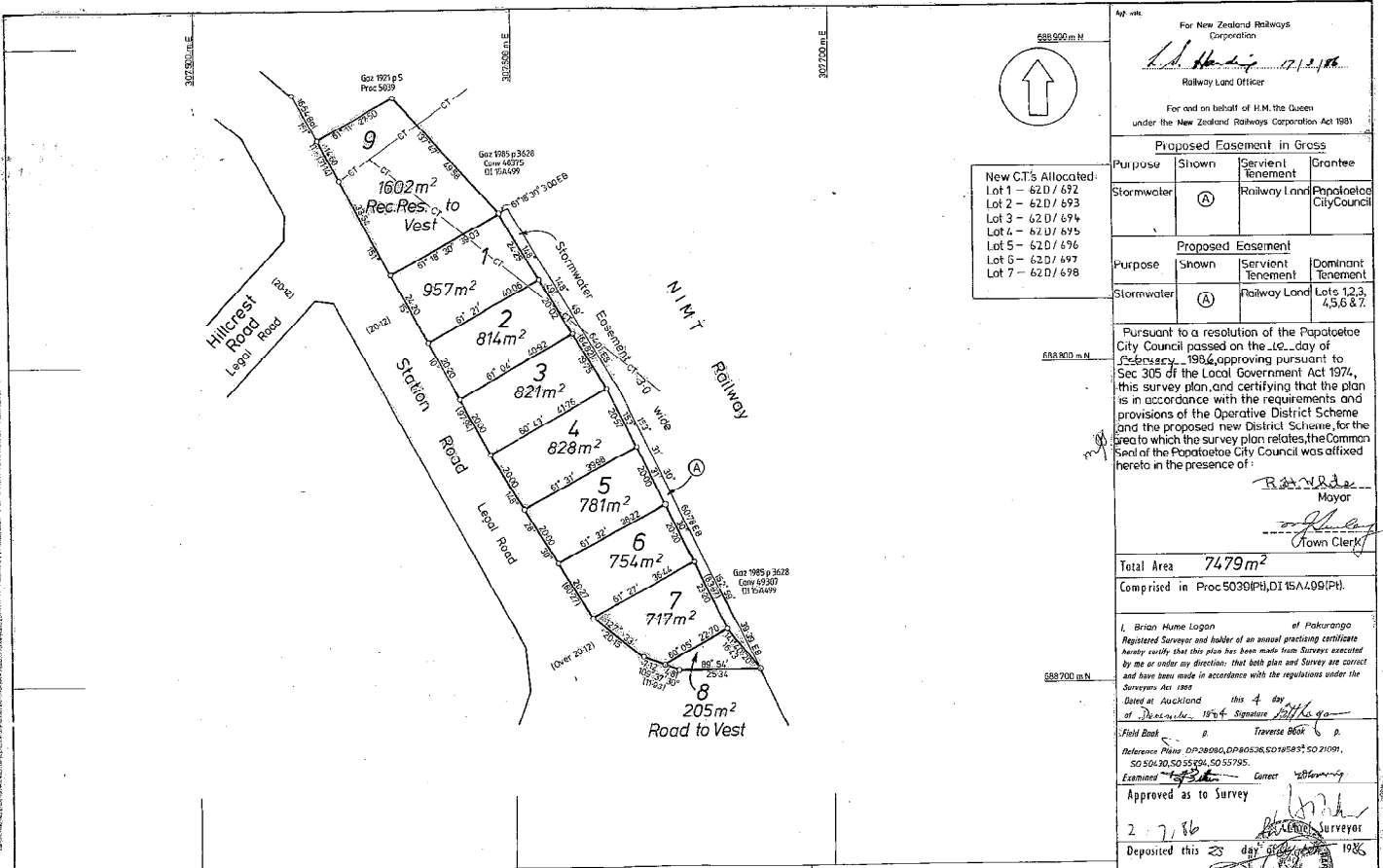
Prior References
GN B474007.1

Estate Fee Simple
Area 957 square metres more or less
Legal Description Lot 1 Deposited Plan 111628

Registered Owners
Elizabeth Vaitini Donnelly and Stephen Jason Crean

Interests

Appurtenant hereto is a right to drain water specified in Easement Certificate B596462.3 - 23.10.1986 at 11.32 am
10785495.2 Mortgage to ANZ Bank New Zealand Limited - 24.5.2017 at 10:53 am



For New Zealand Railways Corporation
 Railway Land Officer
 For and on behalf of H.M. the Queen
 under the New Zealand Railways Corporation Act 1981

Proposed Easement in Gross

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Papatoetoe City Council

Proposed Easement

Purpose	Shown	Servient Tenement	Dominant Tenement
Stormwater	(A)	Railway Land	Lots 1, 2, 3, 4, 5, 6 & 7

Pursuant to a resolution of the Papatoetoe City Council passed on the 10th day of February, 1986, approving pursuant to Sec 305 of the Local Government Act 1974, this survey plan and certifying that the plan is in accordance with the requirements and provisions of the Operative District Scheme and the proposed new District Scheme, for the area to which the survey plan relates, the Common Seal of the Papatoetoe City Council was affixed hereto in the presence of:

R. Ward
Mayor
[Signature]
Town Clerk

Total Area **7479m²**
 Comprised in Proc 5030(PH), DI 15A/499(PH)

I, Brian Hume Logan of Pakuranga Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985

Dated at Auckland this 4 day of February, 1986. Signature *[Signature]*

Field Book p. Traverse B66 p. p.
 Reference Plans DP 28080, DP 80536, SO 18583, SO 21091, SO 50470, SO 55794, SO 55795.
 Examined *[Signature]* Correct *[Signature]*

Approved as to Survey *[Signature]*
 2. 7. 86 Surveyor

Deposited this 23 day of February 1986

File Received 24 MAR 1986
 Registrars

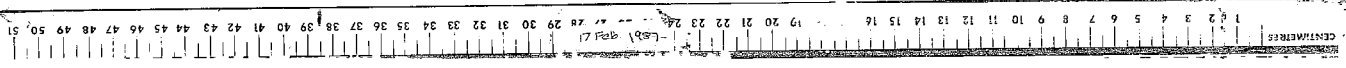
New CT's Allocated:
 Lot 1 - 62D/692
 Lot 2 - 62D/693
 Lot 3 - 62D/694
 Lot 4 - 62D/695
 Lot 5 - 62D/696
 Lot 6 - 62D/697
 Lot 7 - 62D/698

LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X Otahuhu S.D.
 NZMS SHEET No. Papatoetoe 14

Plan of Lots 1-9 Being
 Subdivision of Railway Land

LOCAL AUTHORITY Papatoetoe City
 Surveyed by B.H. Logan
 Scale 1:750 Date Mar 1982 & Nov 1985

File DP-11628





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **112664**
Land Registration District **North Auckland**
Date Issued 17 May 2004

Prior References

NA102D/775

Estate Fee Simple - 1/4 share
Area 173 square metres more or less
Legal Description Lot 6 Deposited Plan 327717

Registered Owners

Housing New Zealand Limited

Estate Fee Simple
Area 462 square metres more or less
Legal Description Lot 5 Deposited Plan 327717

Registered Owners

Housing New Zealand Limited

Interests

Subject to Part IV A Conservation Act 1987
Subject to Section 11 Crown Minerals Act 1991
Subject to Section 241(2) Resource Management Act 1991 (affects DP 327717)
Land Covenant in Easement Instrument 6006939.4 - 17.5.2004 at 9:00 am

LT 327717 (Title Plan)



588 056m

I, James David Sydney Falloon, being a person entitled to practise as a licensed cadastral surveyor, certify that—
 (a) The survey to which this dataset relates is accurate and was undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/1
 (b) This dataset is accurate and has been created in accordance with that Act and those Rules.

[Signature]
 signed 7/8/03.
 date

↑

New Certificates of Title Allocated	
Lot 1	1126600
Lot 2	1126601
Lot 3	1126602
Lot 4	1126603
Lot 5	1126604

PROPOSED EASEMENTS			
Purpose	Shown	Servient Tenement	Dominant Tenement
Party Wall	(A)	Lot 2 Hereon	Lot 3 Hereon
Drainage	(B)	Lot 3 Hereon	Lot 2 Hereon

SCHEDULE OF EXISTING EASEMENT 1467001			
Purpose	Shown	Servient Tenement	Grantee
Drainage	(C)	Lot 2 Hereon	Manukau City Council

Approvals
 Registered Proprietors
 Signed for and on behalf of Housing New Zealand Ltd by its attorney
[Signature] Signature
 Registration Number D. 698477.1
 In the presence of
[Signature] Signature
[Signature] Name
 Contracts Manager
 Housing New Zealand Limited
 Wellington
 on this 13th day of November 2003.

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 21st day of October 2003 subject to the Amalgamation Condition shown hereon.

[Signature]
 Principal Administrative Officer

AMALGAMATION CONDITION
 That Lot 6 hereon (legal access) be held as to four undivided one quarter shares by the owners of Lots 2, 3, 4 and 5 hereon, as tenants in common in the said shares and that individual certificates of title be issued in accordance therewith.
 See D.L.R. reference A 634857

Total Area 2627 m²
 Comprised in Cs7 102D/775 (nil) and 1650/84 (all)

I, James David Sydney Falloon of Auckland, Registered Surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to section 25 of the Survey Act 1986) hereby certify that this plan has been made from surveys conducted by me or under my directions, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1972 or any regulations made in substitution thereof.
 Dated at Auckland this 13th day of November 1993
[Signature]

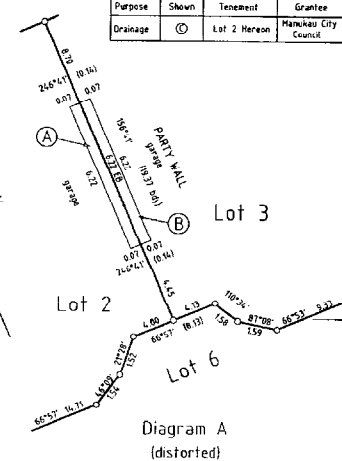
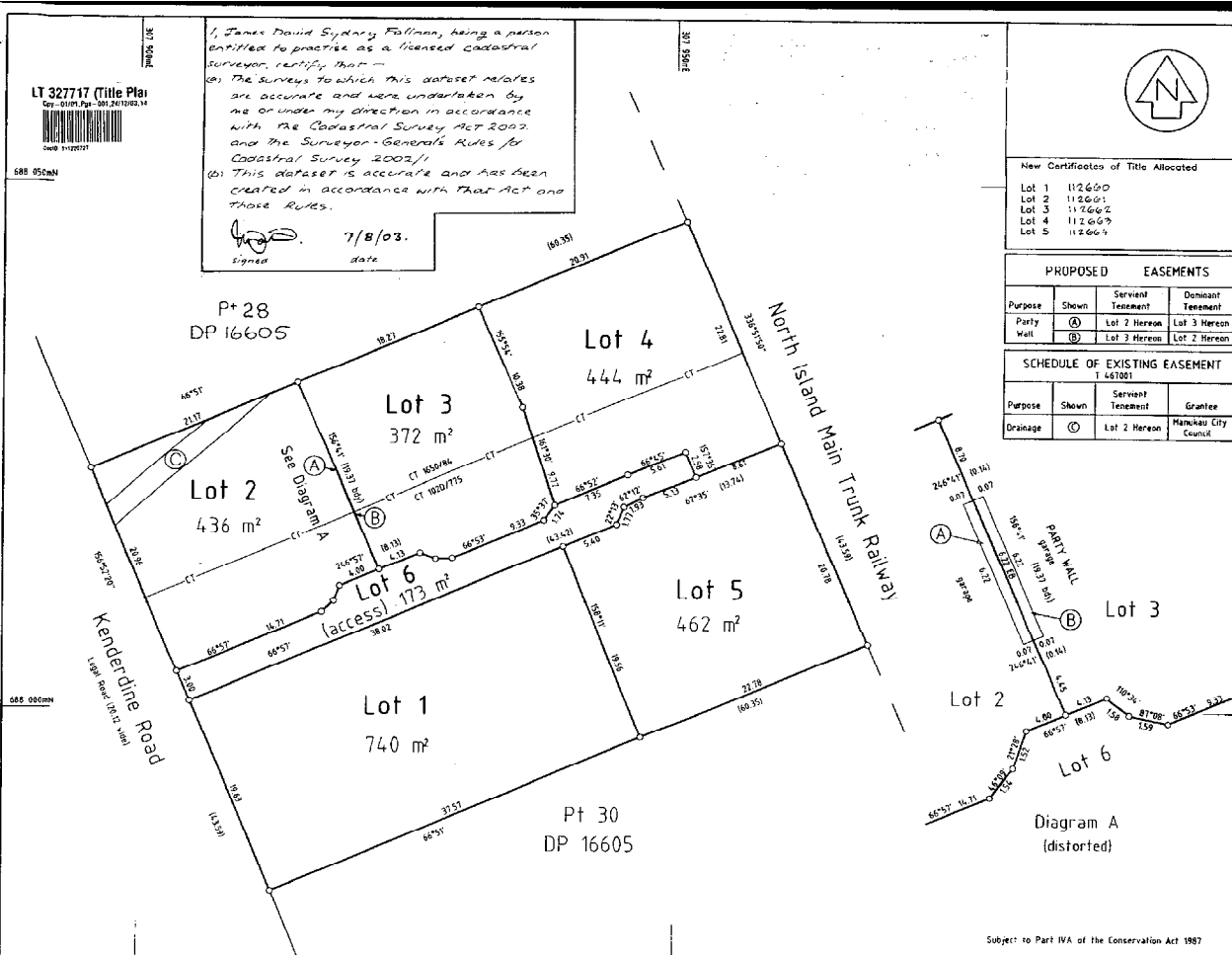
Field Book p. Traverse Book p.
 Reference Plans
 Examined Correct

Approved as to Survey by Land Information NZ on 16/2/2004

Deposited by Land Information NZ on 17/5/2004

Fee \$6000.00 \$14.73
 Received 24 DEC 2003
 Instructions DP 327717

SP 6235 - 74 Kenderine P100
 15068 Approved ARM 9/15



LAND DISTRICT North Auckland
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS 261 SHT RECORD MAP No.....

Lots 1 – 6 being Subdivision of
 Pt Lot 28 and Lot 29 DP 16605

TERRITORIAL AUTHORITY Manukau City
 Surveyed by Manukau Consultants
 Scale 1:250 Date August 1999



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA37C/896**
Land Registration District **North Auckland**
Date Issued 19 April 1977

Prior References

NA1029/82

Estate Fee Simple - 1/4 share
Area 1214 square metres more or less
Legal Description Part Lot 30 Deposited Plan 16605

Registered Owners

Aditya Bhatia

Estate	Leasehold	Instrument	L 537453.2
		Term	999 years as from and including 1.10.1976
Legal Description	Flat 1 Deposited Plan 80955 and Garage 1 Deposited Plan 80955		

Registered Owners

Aditya Bhatia

Interests

- Land Covenant in Lease 537453.2 - 19.4.1977 (Affects Fee Simple)
- 537453.2 Lease of Flat 1 and Garage 1 DP 80955 Term 999 years as from and including 1.10.1976 Composite CT NA37C/896 issued - 19.4.1977 (Affects Fee Simple)
- 537453.3 Lease of Flat 2 Composite CT NA37C/897 issued - 19.4.1977 (Affects Fee Simple)
- Land Covenant in Lease 537453.3 - 19.4.1977 (Affects Fee Simple)
- 537453.4 Lease of Flat 3 Composite CT NA37C/898 issued - 19.4.1977 (Affects Fee Simple)
- Land Covenant in Lease 537453.4 - 19.4.1977 (Affects Fee Simple)
- 537453.5 Lease of Flat 4 Composite CT NA37C/899 issued - 19.4.1977 (Affects Fee Simple)
- Land Covenant in Lease 537453.5 - 19.4.1977 (Affects Fee Simple)
- Land Covenant in Deed 8752438.1 - 28.4.2011 at 1:43 pm
- 9948162.3 Mortgage to ANZ Bank New Zealand Limited - 20.1.2015 at 4:49 pm



- 1) Streets are legal.
- 2) Boundaries of areas to be leased are centres of internal walls or external faces of external walls and appendages.
- 3) Areas A,B,C,D,E & F subject to right of user.

Area A with Flat 1	
- B4C	2
- D4E	3
- F	4

New CST allocated:

Flat 1	37C-896
Flat 2	37C-897
Flat 3	37C-898
Flat 4	37C-899

Approved

S. S. S. S.

Registered Proprietors

Total Area 1214772

Comprised in CT 1079/82

(Brian Stuart-Trotter) at MARDREWD
 Registering Surveyor and holder of an annual practicing certificate
 hereby certifies that this plan has been made from surveys conducted
 by me or under my direction, that such plan and survey are correct
 and have been made in accordance with the regulations under the
 Surveyors Act 1968

Dated at Auckland this 15th day of May 1975
 at May 1975 Signature *B. S. T.*
 Francis Bolt

Field Book A
 Reference Plans DP 53313 DP 16605

Examined *R. S. S.*
 Approved as to Survey and as to the purpose of the plan and as to the right of user

15/8/75
 Chief Surveyor

Deposited this 20th day of August 1975
 at the Office of the Chief Land Registrar
R. S. S.
 Chief Land Registrar

File No. 29-018

LOCAL AUTHORITY Papatoetoe City

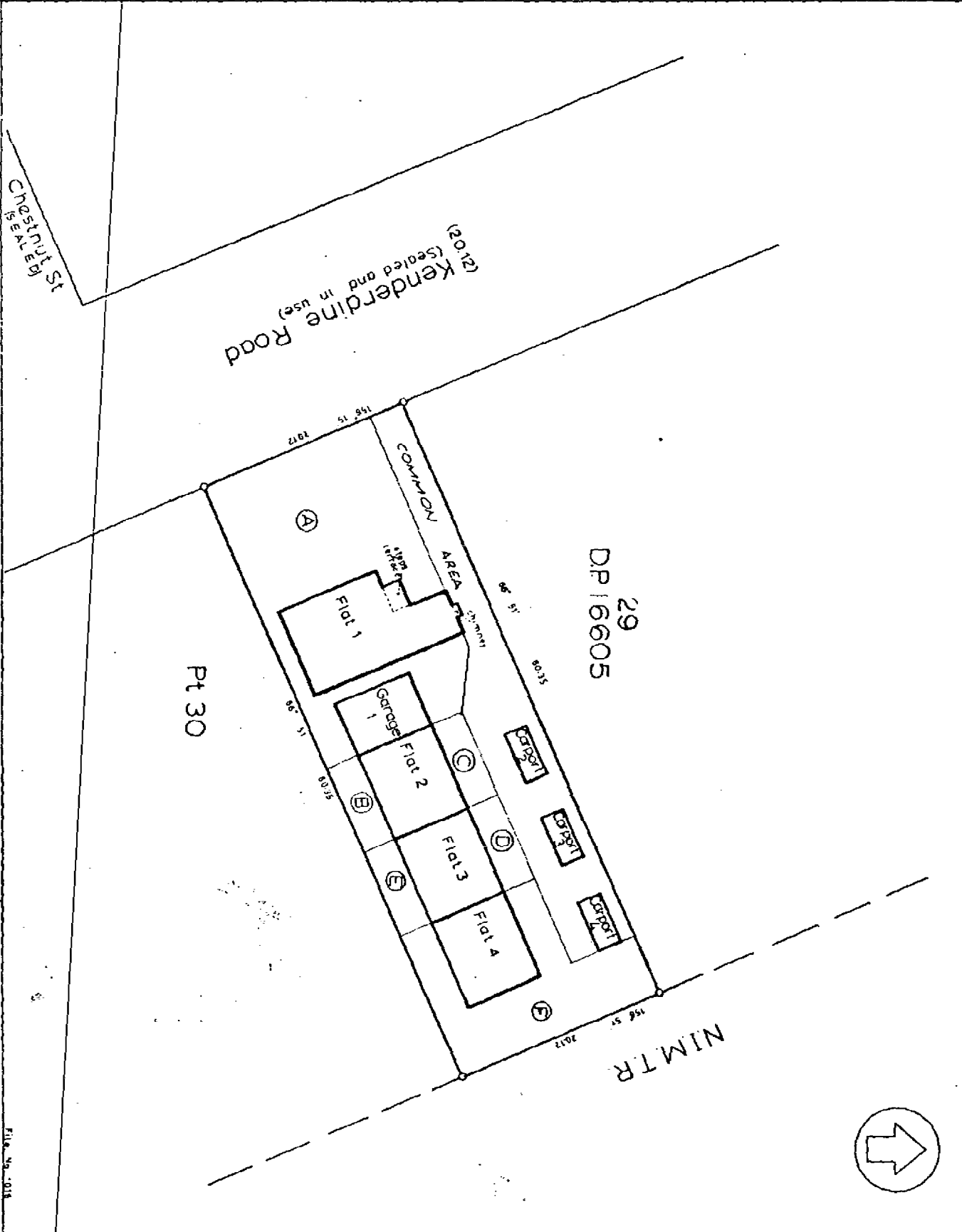
Surveyed by HARRISON & GRIERSON & PARTNERS

Scale 1:250

Date April 1975

LAND DISTRICT North Auckland

SURVEY, BULKY DIST. X Otahuhu



Plan of Flats on Pt Lot 30



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA37C/897**
Land Registration District **North Auckland**
Date Issued 19 April 1977

Prior References

NA1029/82

Estate Fee Simple - 1/4 share
Area 1214 square metres more or less
Legal Description Part Lot 30 Deposited Plan 6605

Registered Owners

Naveen Sharma and Sunita Sudhakar Whaval

Estate	Leasehold	Instrument	L 537453.3
		Term	999 years as from and including 1.10.1976

Legal Description Flat 2 Deposited Plan 80955 and Carport 2
 Deposited Plan 80955

Registered Owners

Naveen Sharma and Sunita Sudhakar Whaval

Interests

- 537453.2 Lease of Flat 1 Composite CT NA37C/896 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.2 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.3 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.3 Lease of Flat 2 and Carport 2 DP 80955 Term 999 years as from and including 1.10.1976 Composite CT NA37C/897 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.4 Lease of Flat 3 Composite CT NA37C/898 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.4 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.5 Lease of Flat 4 Composite CT NA37C/899 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.5 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 9991397.3 Mortgage to ANZ Bank New Zealand Limited - 13.3.2015 at 3:31 pm



DP 16605
29

Pt 30

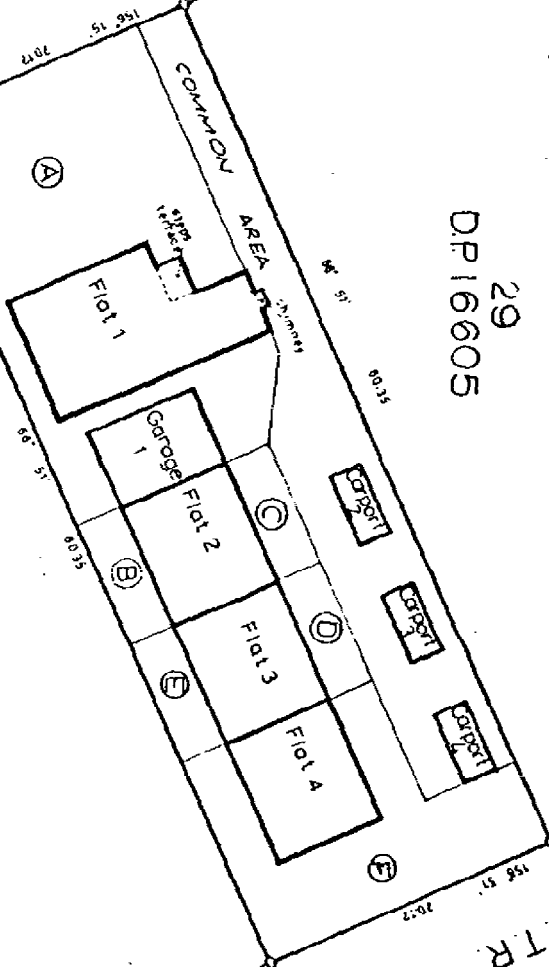
Kenderdine Road
(sealed and in use)

15' 6" CHATELAIN
5' 6" CHATELAIN

LAND DISTRICT North Auckland
SURVEY BLK & DIST. X Otahuhu

Plan of Flats on Pt Lot 30
D.P. 16605

NIMTR



- 1) Streets are legal.
- 2) Boundaries of areas to be leased are centres of internal walls or external faces of external walls and appendages.
- 3) Areas A, B, C, D, E & F subject to rights of user

Area A with Flat 1

A	2
B	3
C	4
D	3
E	4
F	4

New CST allocated:

Flat 1	37C-896
Flat 2	37C-897
Flat 3	37C-898
Flat 4	37C-899

Approved

S. Sumner (Signature)

Registered Proprietors

Total Area 12,147.72
Comprised in CT 1079/82

Brian Stuart Trellord of Mangurewa
Appropriation Surveyor and holder of an actual practicing certificate
hereby certify that this plan has been made from surveys executed
by me or under my direction; that this plan and survey are correct
and have been made in accordance with the regulations under the
Surveyors Act 1951

Walter Mangurewa, Ins. 157th
1975, License No. 258
11 May 1975 (Signature)

Reference Plans DP 53313 DP 16605

Examined by Richard (Signature)
Approved as to Survey for the purposes of the Act

1/8/75
Approved this 8th day of August 1975
of the Auckland District Land Registrar
(Signature)

LOCAL AUTHORITY Paopao to the City
Surveyed by HARRISON & BRIENSON & PARTNERS
Scale 1:250
Date April 1975

File No. 1038
1:5000



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA37C/898**
Land Registration District **North Auckland**
Date Issued 19 April 1977

Prior References
NA1029/82

Estate Fee Simple - 1/4 share
Area 214 square metres more or less
Legal Description Part Lot 30 Deposited Plan 6605

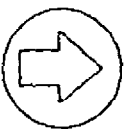
Registered Owners
Michael Kevin Sherry and Irene Margaret Sherry

Estate	Leasehold	Instrument	L 537453.4
		Term	999 years as from and including 1.10.1976
Legal Description	Flat 3 Deposited Plan 80955 and Carport 3 Deposited Plan 80955		

Registered Owners
Michael Kevin Sherry and Irene Margaret Sherry

Interests

- 537453.2 Lease of Flat 1 Composite CT NA37C/896 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.2 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.3 Lease of Flat 2 Composite CT NA37C/897 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.3 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.4 Lease of Flat 3 and Carport 3 DP 80955 Term 999 years as from and including 1.10.1976 Composite CT NA37C/898 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.4 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- 537453.5 Lease of Flat 4 Composite CT NA37C/899 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
- Land Covenant in Lease 537453.5 - 19.4.1977 at 2.46 pm (Affects Fee Simple)



- 1) Streets are legal.
- 2) Boundaries of areas to be leased are centres of internal walls or external faces of external walls and appendages.
- 3) Areas A,B,C,D,E & F subject to right of user

Area A with Flat 1
 - B4C - 2
 - D4E - 3
 - F - 4

New CSI allocated:

Flat 1	37C-896
Flat 2	37C-897
Flat 3	37C-898
Flat 4	37C-899

Approved
 Registered Proprietors
 Total Area 1214m²
 Comprised in CT 1079/82

Brian Stuart Tailford
 Registered Surveyor and holder of an aerial photogrammetric licence
 hereby certify that this plan has been made from surveys executed by me or under my direction. That both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1985.

Dated at Manurewa this 15th day of May 1975
 Signed at Manurewa this 15th day of May 1975
 Registrar of Land

Approved as to form and content
 Approved as to survey and content
 Approved as to the purposes of the Survey Act 1975

Deposited this 20th day of August 1975
 Registrar of Land

Kenderdine Road (2102) (Sealed and in use)

15.1611
 CHRISTINE SEALE

LAND DISTRICT North Auckland
 SURVEY BLK & DIST. X Otahuhu

29
 DP16605

Pt 30

NIMTR

Plan of Flats on Pt Lot 30

D.P.16605

LOCAL AUTHORITY Papatoetoe City
 Surveyed by HARRISON & BRIENSON & PARTNERS
 Scale 1:250
 Date April 1975

File No. 103



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA37C/899**
Land Registration District **North Auckland**
Date Issued 19 April 1977

Prior References

NA1029/82

Estate Fee Simple - 1/4 share
Area 1214 square metres more or less
Legal Description Part Lot 30 Deposited Plan 16605

Registered Owners

Jatinder Kumar and Anu Sunita

Estate	Leasehold	Instrument	L 537453.5
		Term	999 years as from and including 1.10.1976

Legal Description Flat 4 Deposited Plan 80955 and Carport 4
Deposited Plan 80955

Registered Owners

Jatinder Kumar and Anu Sunita

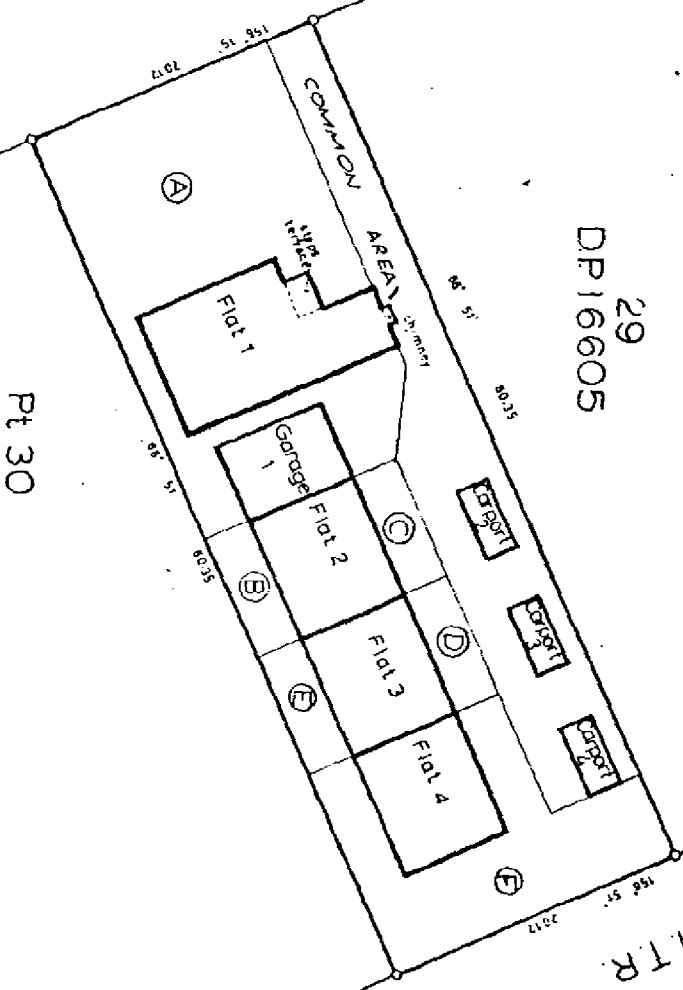
Interests

- 537453.2 Lease of Flat 1 Composite CT NA37C/896 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
Land Covenant in Lease 537453.2 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
537453.3 Lease of Flat 2 Composite CT NA37C/897 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
Land Covenant in Lease 537453.3 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
537453.4 Lease of Flat 3 Composite CT NA37C/898 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
Land Covenant in Lease 537453.4 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
Land Covenant in Lease 537453.5 - 19.4.1977 at 2.46 pm (Affects Fee Simple)
537453.5 Lease of Flat 4 and Carport 4 DP 80955 Term 999 years as from and including 1.10.1976 Composite CT
NA37C/899 issued - 19.4.1977 at 2.46 pm (Affects Fee Simple)
11088558.2 Mortgage to ANZ Bank New Zealand Limited - 19.4.2018 at 3:32 pm



Kenderdine Road
(Scaled and in use)
(2102)

15 FRIDGE
CHURCH ST
(Scale)



29
DP16605

Pt 30

NIMTR

LAND DISTRICT North Auckland
Plans, Bk. 2 Dist. X Otahuhu

Plan of Flats on Pt Lot 30
D.P.16605

LOCAL AUTHORITY Papatoetoe City
Surveyed by HARRISON & BRINSON & PARTNERS
Scale 1:250
Date April 1975

- 1) Streets are legal.
- 2) Boundaries of areas to be leased are centres of internal walls or external faces of external walls and appendages.
- 3) Areas A,B,C,D,E & F subject to right of user

Area A with Flat 1	1
Area B	2
Area C	3
Area D	4

New GST allocated:

Flat 1	37C-896
Flat 2	37C-897
Flat 3	37C-898
Flat 4	37C-899

Approved

Registered Proprietors
Total Area 1214.77²
Comprised in CT 1079/82

I, Brian Stuart Trafford of Manurewa Registered Surveyor and holder of a general practicing certificate hereby certify that this plan has been made from survey executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1958
Dated at Manurewa this 15th day of May 1975
Signature *Brian Trafford*
Full Name B. Trafford
Reference Plans DP/53313 DP16605

Approved as to Survey on the Purpose of Leasing and Easement
15/5/75
Chief Surveyor

Prepared this 30th day of August 1975
Approved as to Plan
Signature *Charles Palmer*
Title Officer Land Registrar
File No. 1009



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA1328/42
Land Registration District North Auckland
Date Issued 23 August 1956

Prior References

NA1029/83

Estate Fee Simple
Area 1214 square metres more or less
Legal Description Part Lot 30-31 Deposited Plan 16605

Registered Owners

Anil Kumar Narayan, Reshmi Lata Narayan and PNL Trustee Services Limited

Interests

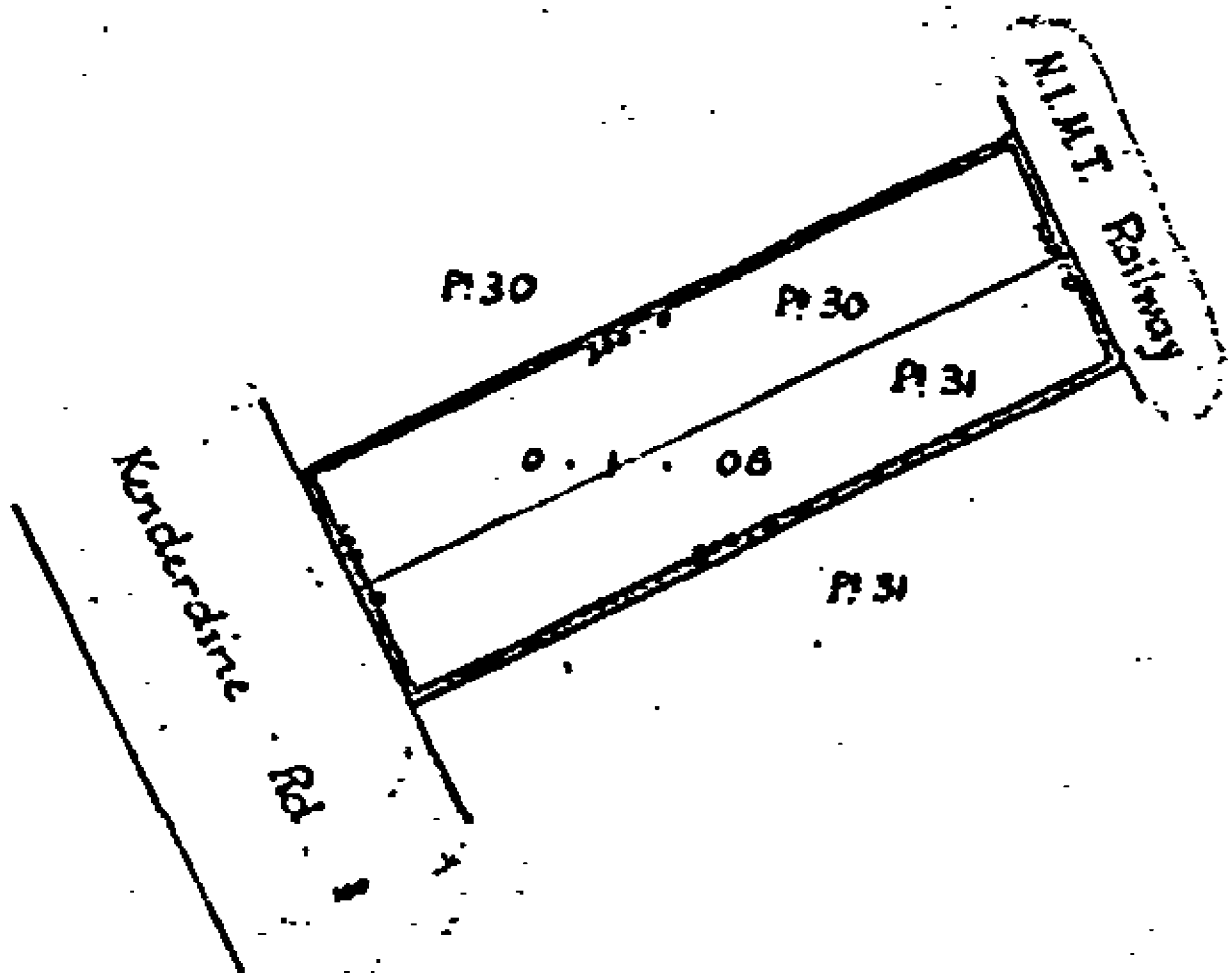
Fencing Agreement in Transfer 168974
10087111.6 Mortgage to ANZ Bank New Zealand Limited - 16.6.2015 at 6:09 pm

EQUIVALENT METRIC

AREA IS 1214m²

1214m²

Papatoetoe Borough





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **NA80A/741**
Land Registration District **North Auckland**
Date Issued 22 March 1990

Prior References

NA1328/43

Estate Fee Simple - 1/3 share
Area 1214 square metres more or less
Legal Description Part Lot 31 Deposited Plan 16605

Registered Owners

Rajeshwari Balachandran

Estate	Leasehold	Instrument	L C119572.3
		Term	999 years commencing on the 1.2.1990

Legal Description Flat 1 Deposited Plan 135948 and Carport
1 Deposited Plan 135948

Registered Owners

Rajeshwari Balachandran

Interests

Fencing Agreement in Transfer 168974 (Affects Fee Simple)
C119572.3 Lease of Flat 1 and Carport 1 DP 135948 Term 999 years commencing on the 1.2.1990 Composite CT NA80A/741 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.3 - 22.3.1990 (Affects Fee Simple)
C119572.4 Lease of Flat 2 Composite CT NA80A/742 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.4 - 22.3.1990 (Affects Fee Simple)
C119572.5 Lease of Flat 3 Composite CT NA80A/743 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.5 - 22.3.1990 (Affects Fee Simple)
10464432.3 Mortgage to ANZ Bank New Zealand Limited - 1.7.2016 at 12:40 pm



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA80A/742**
Land Registration District **North Auckland**
Date Issued 22 March 1990

Prior References

NA1328/43

Estate Fee Simple - 1/3 share
Area 1214 square metres more or less
Legal Description Part Lot 31 Deposited Plan 16605

Registered Owners

Patricia Alison Singh

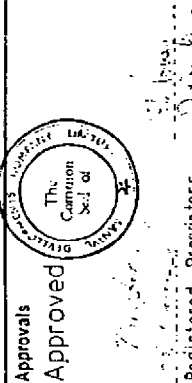
Estate	Leasehold	Instrument	L C119572.4
		Term	999 years commencing on the 1.2.1990
Legal Description	Flat 2 Deposited Plan 135948 and Carport 2 Deposited Plan 135948		

Registered Owners

Patricia Alison Singh

Interests

Fencing Agreement in Transfer 168974 (Affects Fee Simple)
C119572.3 Lease of Flat 1 Composite CT NA80A/741 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.3 - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.4 - 22.3.1990 (Affects Fee Simple)
C119572.4 Lease of Flat 2 and Carport 2 DP 135948 Term 999 years commencing on the 1.2.1990 Composite CT NA80A/742 issued - 22.3.1990 (Affects Fee Simple)
C119572.5 Lease of Flat 3 Composite CT NA80A/743 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.5 - 22.3.1990 (Affects Fee Simple)
C133272.4 Mortgage to The National Bank of New Zealand Limited - 2.5.1990 at 11.33 am



Approved
Registered Proprietors

Boundaries of areas to be leased are the external face of exterior walls unless otherwise stated.

Areas shown as (A), (B) & (C) to be subject to restrictive covenants.

Unless otherwise shown restrictive covenant boundaries are not visibly defined.

Pursuant to Section 214 of the Local Government Act 1974 I hereby certify that construction of the building depicted on this plan commenced on the 1st of April 1979 and means of escape in case of fire as were required by the By-laws of the Manukau City Council applying as at the date of this certificate.

I further certify that construction of the buildings depicted hereon as Flats 2 & 3 and Carports 1-3 commenced after 1st of April 1979 and a building permit for the construction of the buildings depicted as Flats 2 & 3 and Carports 1-3 hereon has been issued by the Manukau City Council pursuant to its By-laws. Dated this 27th day of NOVEMBER 1980.

L.A. AUTHORITY
A. B. [Signature]

AUTHORISED OFFICER DOC No.

I, Rodney Malcolm McFarland of Auckland, Registrar Survey and Meter of an annual licensing certificate hereby certify that the buildings shown hereon are erected within the boundaries and are situated within the boundaries of CT 1328/43 and that the plan is correct. Dated the 20th of October 1980.

Rodney Malcolm McFarland

New CTs Allocated
Flat 1 - 80A/141 Flat 2 - 80A/142
Flat 3 - 80A/143

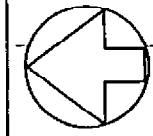
Total Area 1214 m²
Comprised in CT 1328/43 (All)

Registered Surveyor and Meter of an annual licensing certificate of the Survey Act 1980 hereby certify that this plan has been made from surveys conducted by me or under my direction, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1979 in force at Auckland on the 10th day of October 1980.

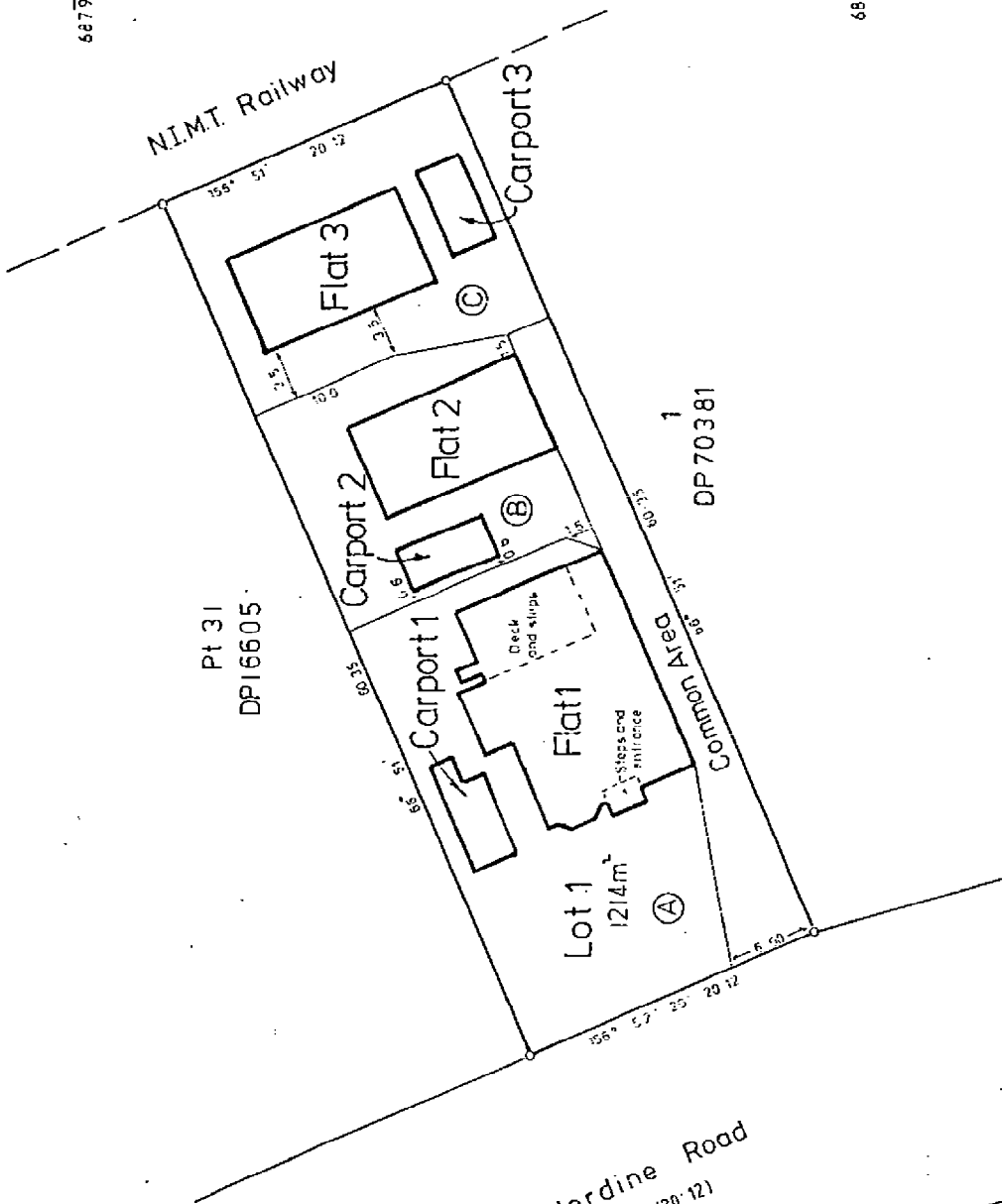
Field Book P Traverse Book P
Reference Plans
Examined *N. DeLorenzo* Council Clerk

Approved as to Survey
26 11 80
Deposited this 23rd day of NOVEMBER 1980

Chief Surveyor
File Received Instructions
DP 13594E



687975 m Nth



687925 m Nth



TERRITORIAL AUTHORITY Manukau City
Surveyed by R. M. McFarland
Scale 1:250 Date October 1980

Plan of Lot 1 and Flats 1-3 thereon
being Pt. Lot. 31 DP 16605

LAND DISTRICT North Auckland
SURVEY BLK. & DIST. X Otahuhu
NZMS 261 SHT
RECORD MAP No 14

307900 m E

307950 m E



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA80A/743**
Land Registration District **North Auckland**
Date Issued 22 March 1990

Prior References

NA1328/43

Estate Fee Simple - 1/3 share
Area 1214 square metres more or less
Legal Description Part Lot 31 Deposited Plan 16605

Registered Owners

Suman Das and Anamika Das

Estate	Leasehold	Instrument	L C119572.5
		Term	999 years commencing on the 1.2.1990

Legal Description Flat 3 Deposited Plan 135948 and Carport
3 Deposited Plan 135948

Registered Owners

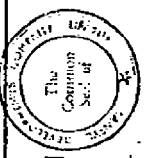
Suman Das and Anamika Das

Interests

Fencing Agreement in Transfer 168974 (Affects Fee Simple)
C119572.3 Lease of Flat 1 Composite CT NA80A/741 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.3 - 22.3.1990 (Affects Fee Simple)
C119572.4 Lease of Flat 2 Composite CT NA80A/742 issued - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.4 - 22.3.1990 (Affects Fee Simple)
Land Covenant in Lease C119572.5 - 22.3.1990 (Affects Fee Simple)
C119572.5 Lease of Flat 3 and Carport 3 DP 135948 Term 999 years commencing on the 1.2.1990 Composite CT
NA80A/743 issued - 22.3.1990 (Affects Fee Simple)
10430050.3 Mortgage to ANZ Bank New Zealand Limited - 16.5.2016 at 3:45 pm

Approvals

Approved



Registered Proprietors

Boundaries of areas to be leased are the external face of exterior walls unless otherwise stated

Areas shown as (A), (B) & (C) to be subject to restrictive covenants

Unless otherwise shown, restrictive covenant boundaries are not visibly defined. Pursuant to Section 314 of the Local Government Act 1974, I hereby certify that construction of the building depicted as Flat 1, however, commenced prior to 1st of April 1979, and would be provided with such appliances, apparatus, fun and means of escape as are of the nature as were required by the By Laws of the Manukau City Council applying as at the date of this certificate

I further certify that construction of the buildings depicted herein as Flats 2 & 3 and Carports 1, 2 & 3 commenced prior to 1st of April 1979 and a building plan for the construction of the buildings depicted as Flats 2 & 3 and Carports 1, 2 & 3 herewith has been submitted to the Manukau City Council. Plans submitted by LA AUTUMN dated this 27th day of NOVEMBER 1989.

AUTHORISED OFFICER 300790

Rodney Malcolm McFarland of Auckland Registered Surveyor and holder of an annual practicing certificate hereby certify that the boundaries shown and are situated within the boundaries of CT 1328/43 and the plan is correct. Dated the 10th of October 1989.

New CTs Allocated
Flat 1 - 805/141
Flat 2 - 805/142
Flat 3 - 805/143

Total Area 1214 m²

Comprised in CT 1328/43 (All)

Rodney Malcolm McFarland of Auckland Registered Surveyor and holder of an annual practicing certificate hereby certify that the plan has been made from surveys made by me or under my directions that both plans and survey regulations have been made in accordance with the Survey Regulations 1977 as amended at Auckland this 10th day of October 1989.

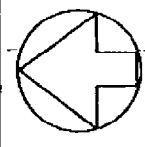
Field Book Traverse Book
Reference Plans
Examined N. DeLoraine Corner

Approved as to Survey

26 11 90

Deposited this 22nd day of March 1990

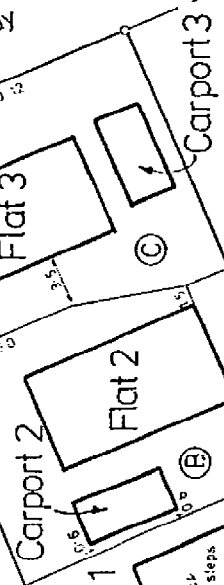
File Received 14/10/89
Insurances
DP 13594



687975 m Nth

N.I.M.T. Railway

Pt 31
DP 16605



Kenderdine Road
Legal Road (20' 12")

Chestnut Road

687975 m Nth

308000 m E



307950 m E

TERRITORIAL AUTHORITY Manukau City
Surveyed by R.M. McFarland
Scale 1:250
Date October 1989

Plan of Lot 1 and Flats 1-3 thereon
being Pt. Lot. 31 DP.16605

LAND DISTRICT North Auckland
SURVEY BLK. & DIST. X Otahuhu
NZMS 261 SHT
RECORD MAP No 14
Papers to be deposited



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/177**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.4
		Term	999 years commencing on 1.6.1984

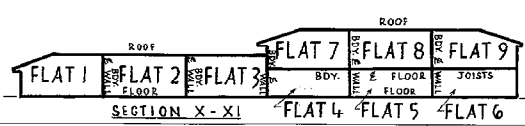
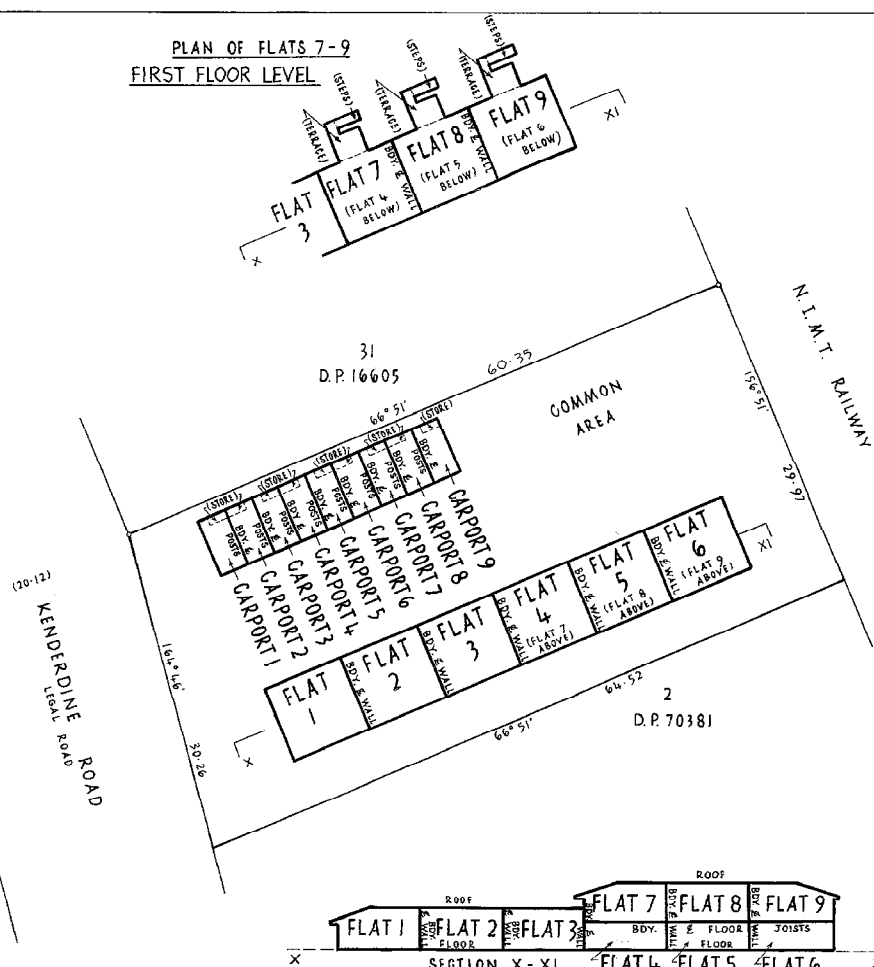
Legal Description Flat 1 Deposited Plan 102387 and Carport
1 Deposited Plan 102387

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated: *30* this day of *March* 1984
[Signature] Signature

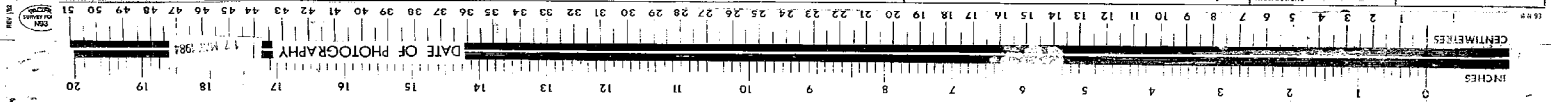
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 215 1984
 Deposited this 21st day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

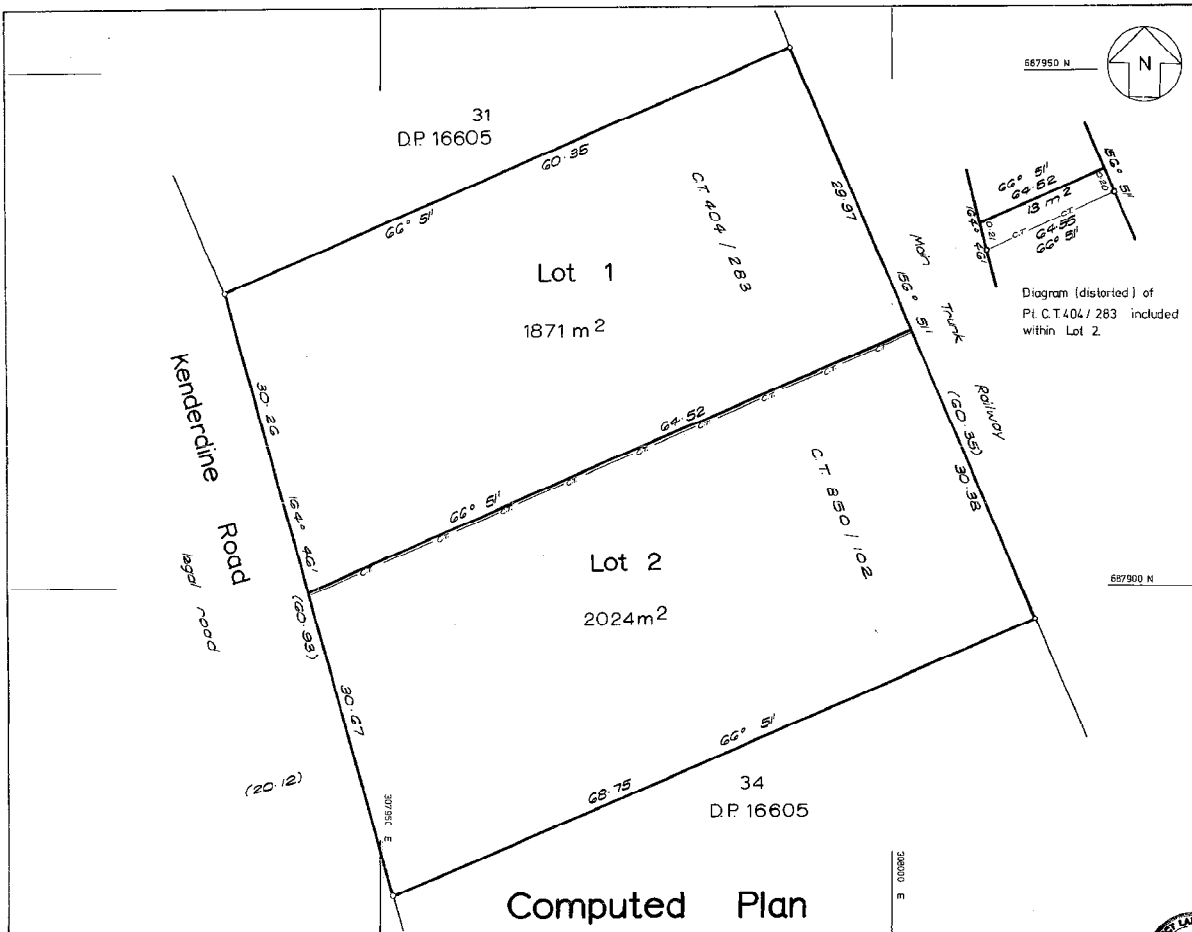
Instructions
 15 APR 84
 DPIO2387

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984





Registered Owner

NEW C.Ts ALLOCATED
 Lot 1 C.T. 27A/755
 Lot 2 C.T. 27A/756

Total Area 3895 m²
 Comprised in C.T.'s 404/283
 850/102

I, Richard E. Eason Registrar of Deeds
 Registrar Surveyor and holder of an annual practicing certificate
 hereby certify that this plan has been made from surveys executed
 by me or under my direction, that both plan and survey are correct
 and have been made in accordance with the regulations under the
 Surveyors Act 1966

Dated at Auckland this 15th day
 of September 1973 Signature [Signature]

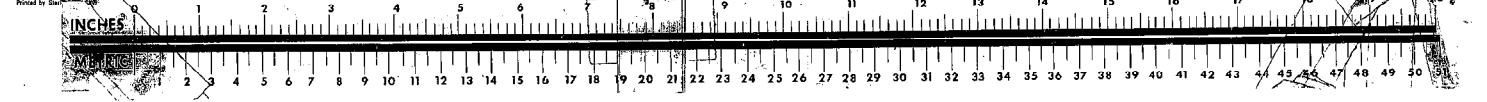
Field Book p. Traverse Book p.
 Reference Plans D.P. 16605
 Examined K.W. Eason Correct
 Approved as to Survey [Signature]
 15/9/73 Assistant Chief Surveyor
 Deposited this 22nd day of October 1973
[Signature] District Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X.
 NZMS SHEET No.

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/178**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References

NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners

Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.5
		Term	999 years commencing on 1.6.1984

Legal Description Flat 2 Deposited Plan 102387 and Carport
2 Deposited Plan 102387

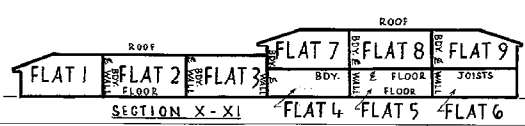
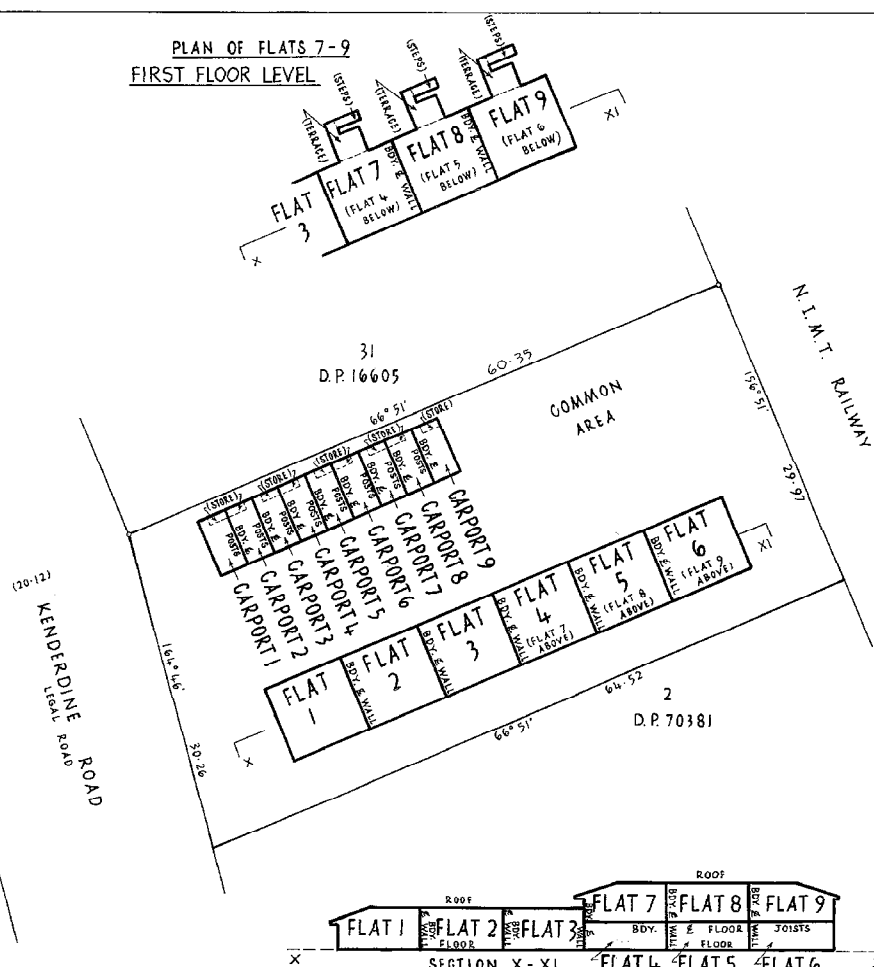
Registered Owners

Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I, DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERRECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated this day of *[Signature]*

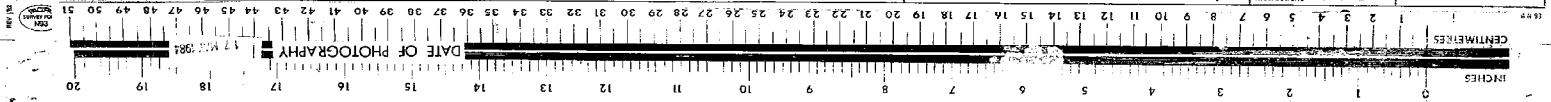
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of LEASING FLATS ONLY
 7.5.1984
 Deposited this 5th day of May 1984
 for the purpose of LEASING FLATS ONLY
 M. M. 2858
 15 APR 84
 Instructions

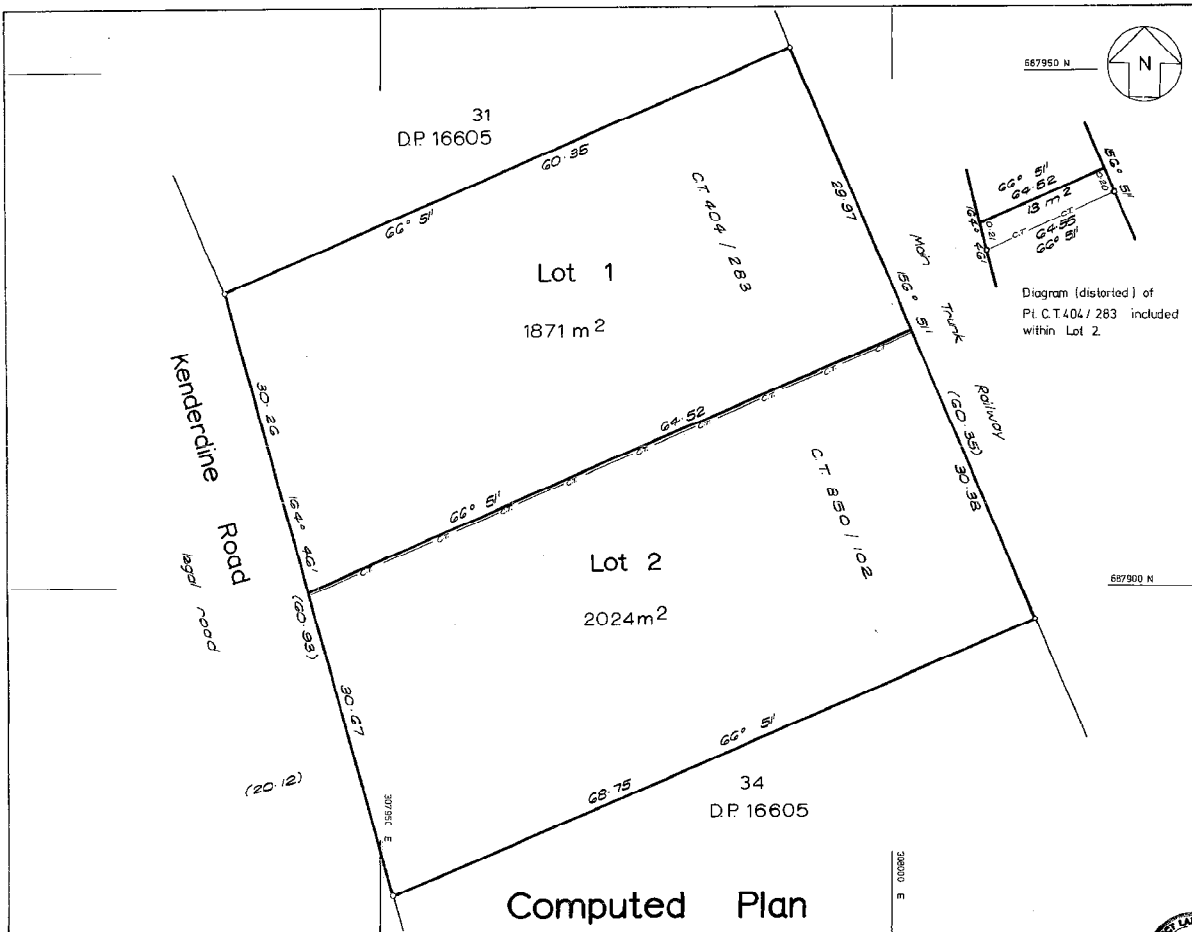
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984

DPIO2387





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

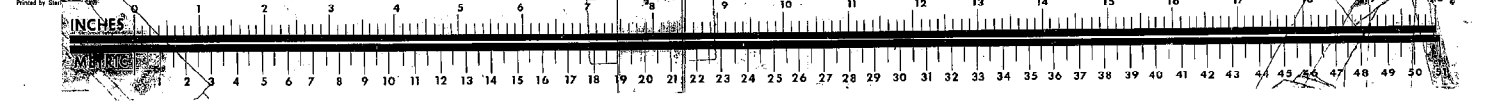
Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Land, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Plan	18/8/73
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	15/10/73 Assistant Chief Surveyor
Deposited this	22 nd day of October 1973
By	Assistant Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No.

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
 Assistant Land Registrar
DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/179**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.6
		Term	999 years commencing on 1.6.1984

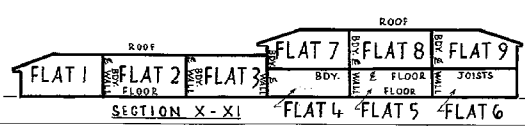
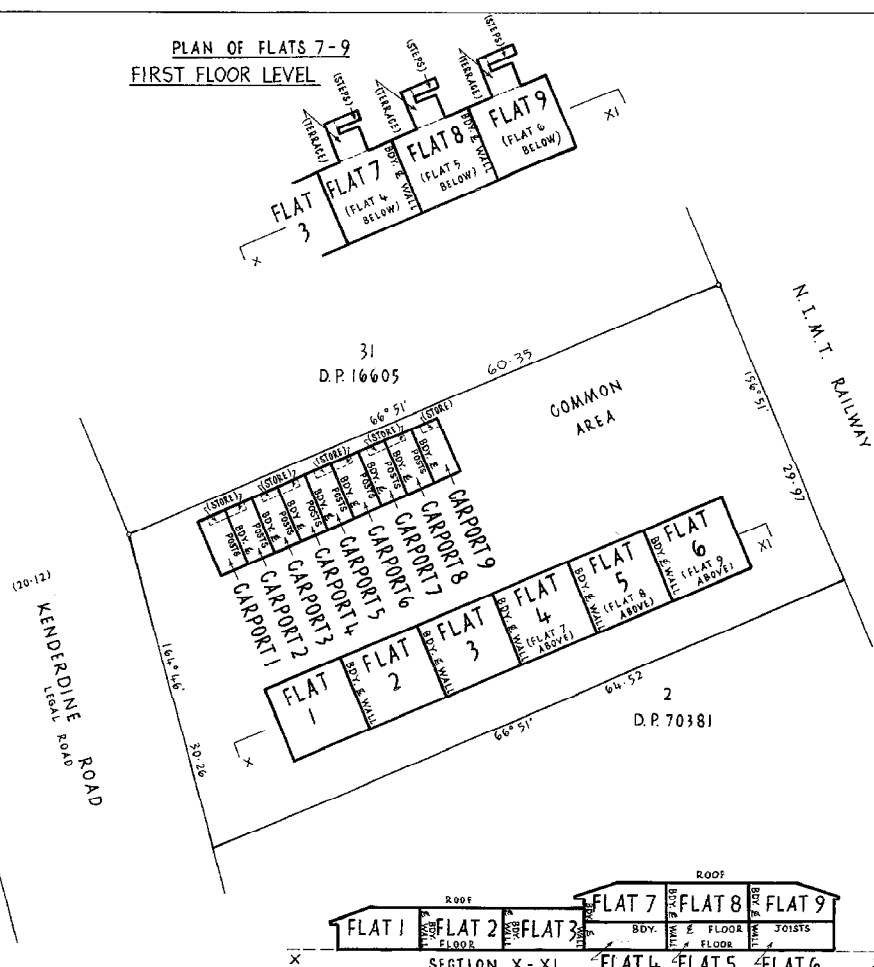
Legal Description Flat 3 Deposited Plan 102387 and Carport
3 Deposited Plan 102387

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERRECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984
[Signature] Signature

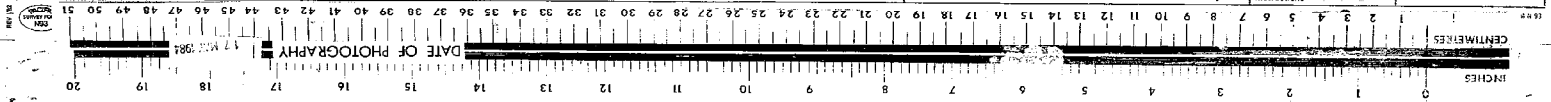
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 7.5.1984
 Deposited this 5th day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

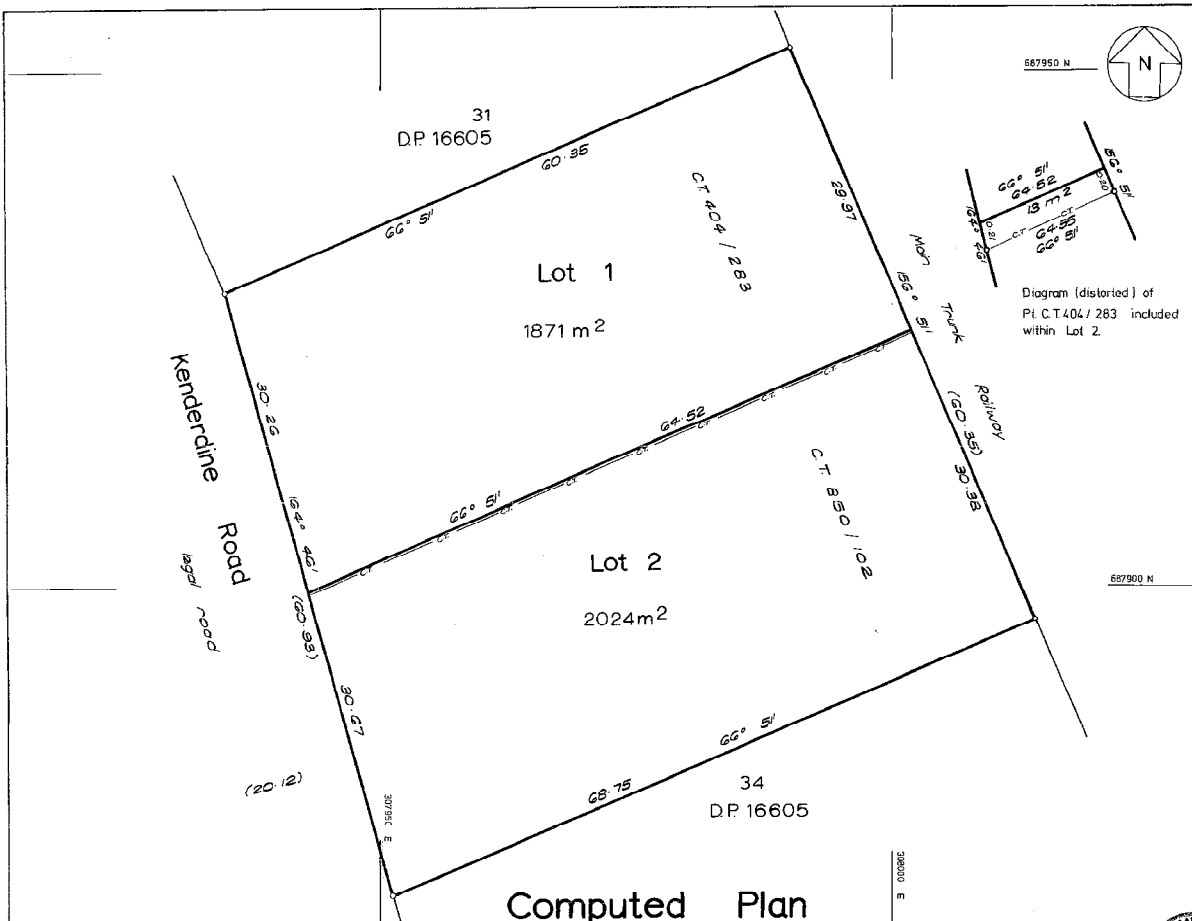
Instructions
 DPIO2387

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Deeds, Registrar General and holder of an annual practicing certificate, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Execution	this 15 th day of September 1973
Signature	<i>[Signature]</i>
Field Book	p. Traverser Book p.
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	<i>[Signature]</i>
Date	15/10/73
Position	Assistant Chief Surveyor
Signature	<i>[Signature]</i>
Position	Deputy Land Registrar

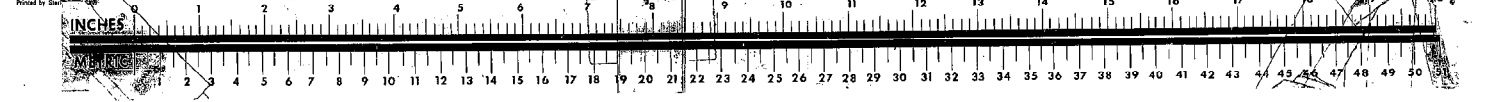
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No.

Subdiv of
Plan of Lots 1&2 being ^ Lots 32 & 33 D.P.16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
[Signature]
 District Land Registrar

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/180**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References

NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners

Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.7
		Term	999 years commencing on 1.6.1984

Legal Description Flat 4 Deposited Plan 102387 and Carport
4 Deposited Plan 102387

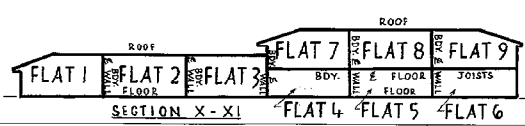
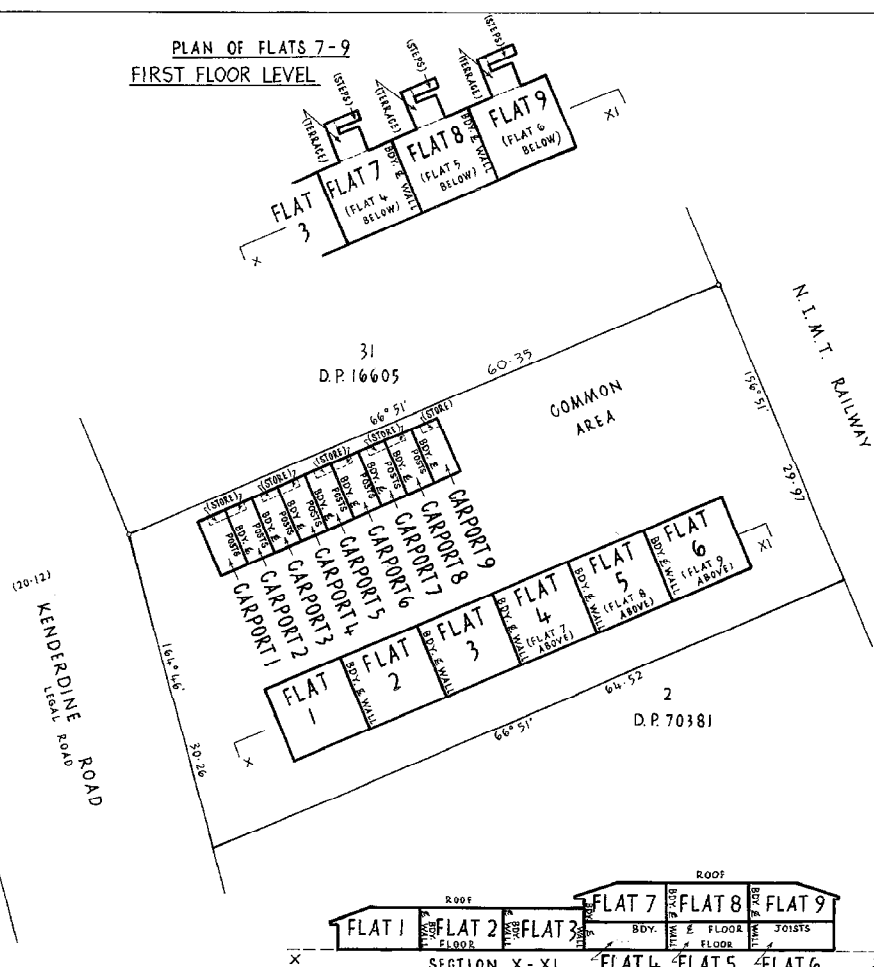
Registered Owners

Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERRECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practicing certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Surveyors Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984
[Signature] Signature

Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 7.5.1984
 Deposited this 5th day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

Scale 1:250 Date JANUARY 1984

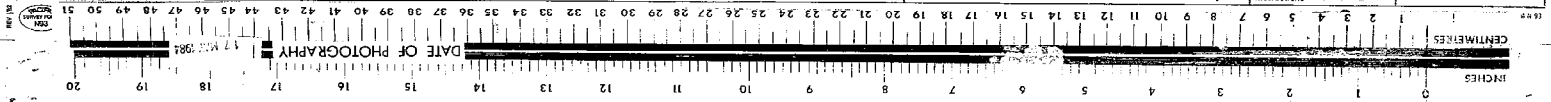
INSTRUCTIONS

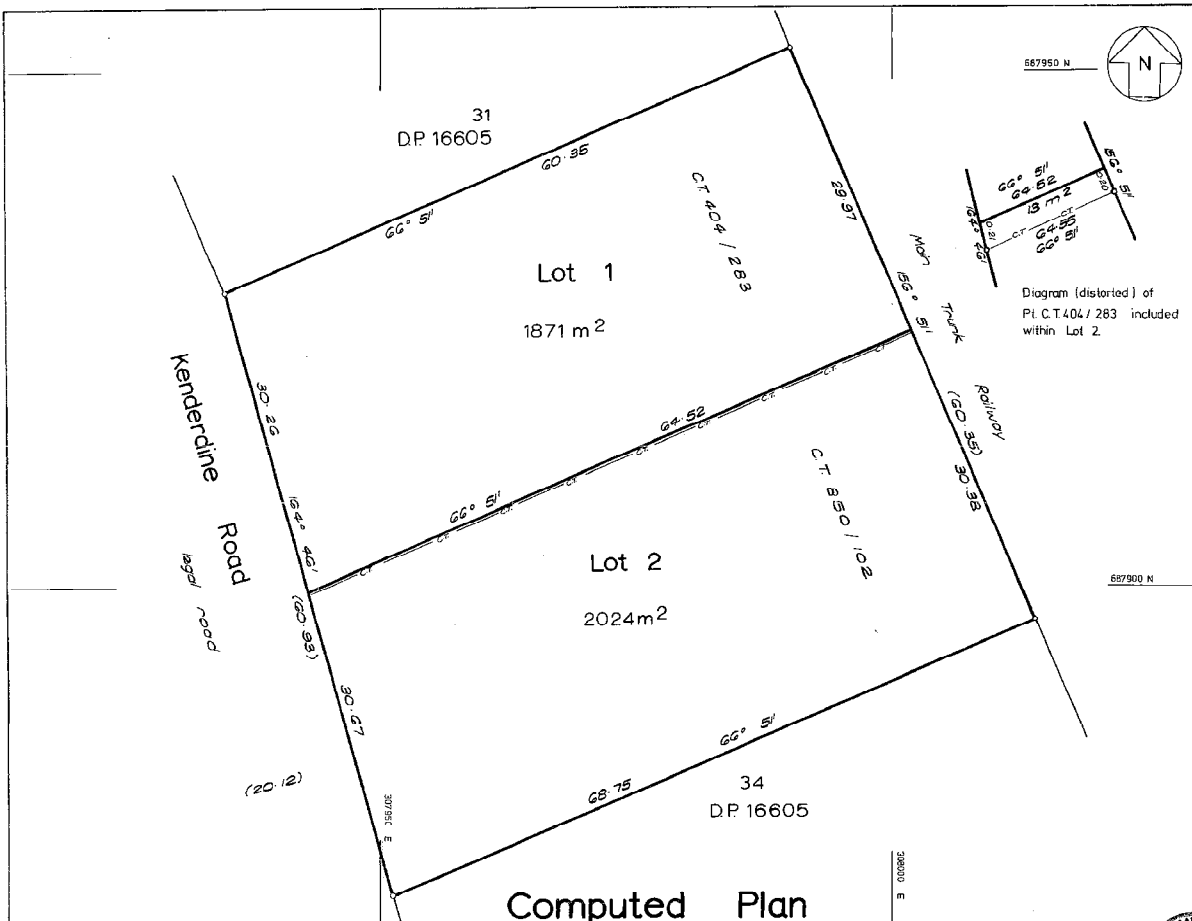
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984

DPIO2387





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Land, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Plan	18/8/73
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	15/10/73
Deposited this	22 nd day of October 1973

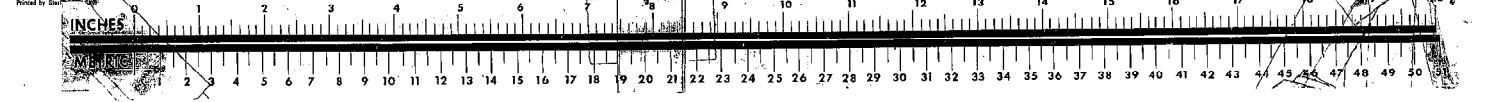
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No.

Subdiv of
Plan of Lots 1&2 being ^ Lots 32 & 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
 Bruce Harrison Registrar of Land

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/181**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

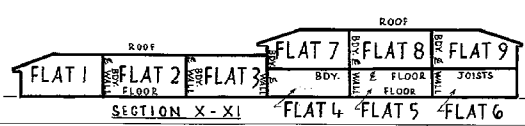
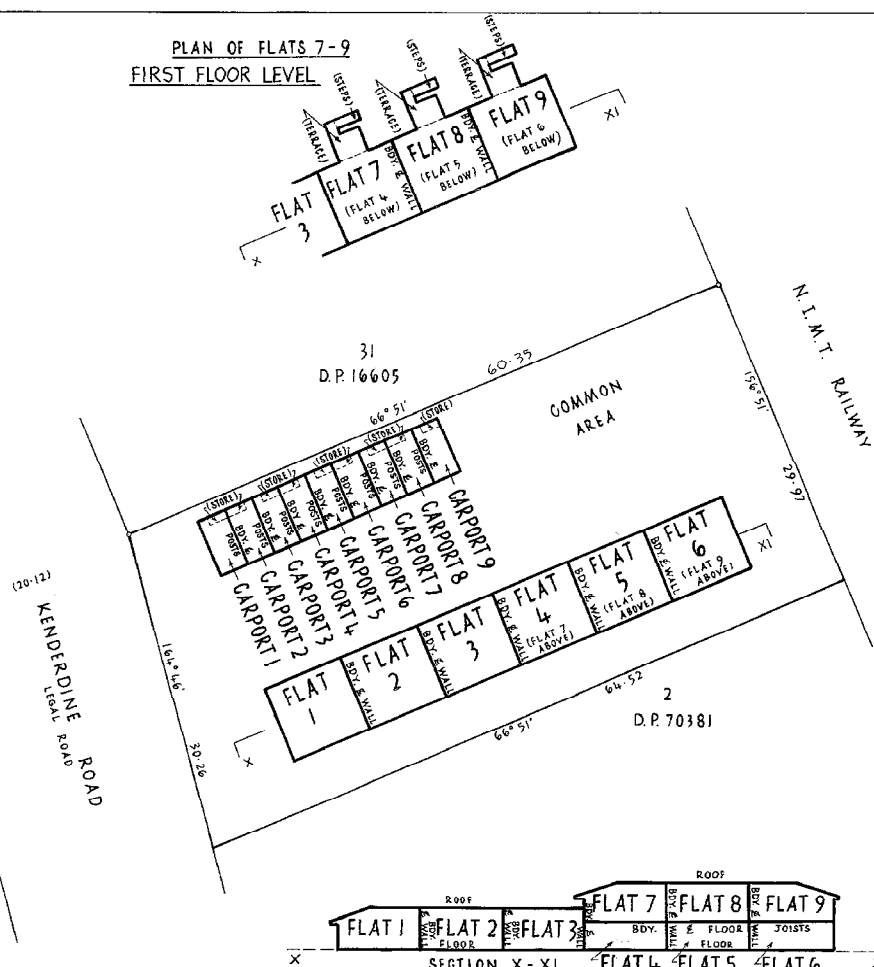
Estate	Leasehold	Instrument	L B316652.8
		Term	999 years commencing on 1.6.1984
Legal Description	Flat 5 Deposited Plan 102387 and Carport 5 Deposited Plan 102387		

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I, DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984

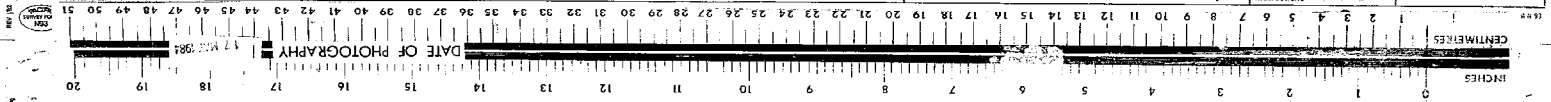
Field Book *p.* Traverse Book *p.*
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey *[Signature]*
 FOR THE PURPOSE OF LEASING FLATS ONLY
 Deposited this 30th day of *March* 1984
 Chief Surveyor
 District Land Registrar
 Instructions

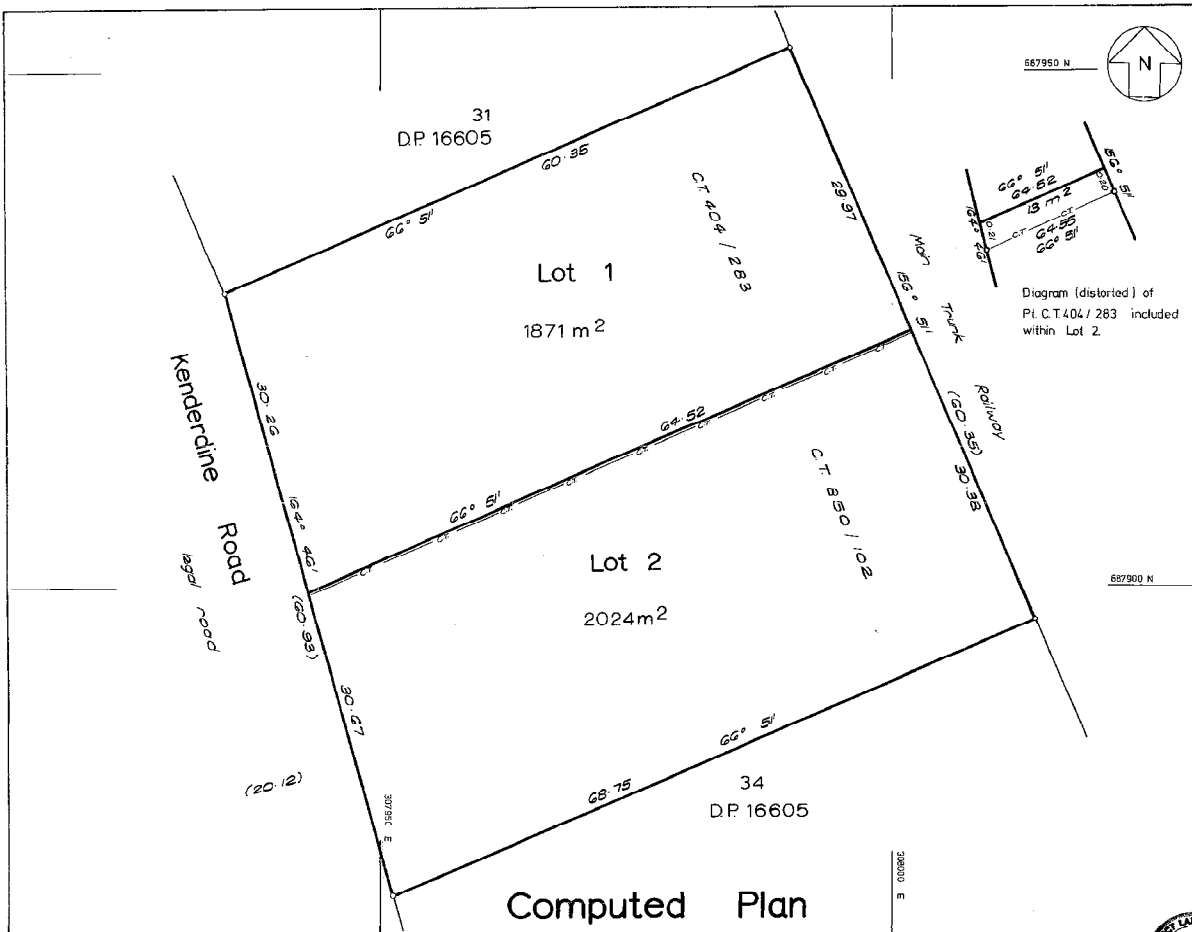
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984

DPIO2387





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

Total Area 3895 m²
 Comprised in C.T.'s 404 / 283
 850 / 102

I, Richard E. Eason Registrar of Deeds
 Registrar Surveyor and holder of an annual practicing certificate
 hereby certify that this plan has been made from surveys executed
 by me or under my direction, that both plan and survey are correct
 and have been made in accordance with the regulations under the
 Surveyors Act 1966

Dated at Auckland this 15th day
 of September 1973 Signature [Signature]

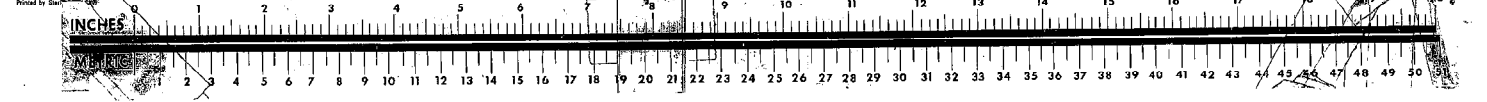
Field Book p. Traverse Book p.
 Reference Plans D.P. 16605
 Examined K.W. Eason Correct
 Approved as to Survey [Signature]
 15/09/73 Assistant Chief Surveyor
 Deposited this 22nd day of October 1973
[Signature] District Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X.
 NZMS SHEET No.

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/182**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.9
		Term	999 years commencing on 1.6.1984

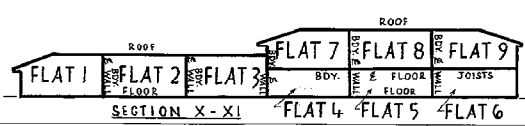
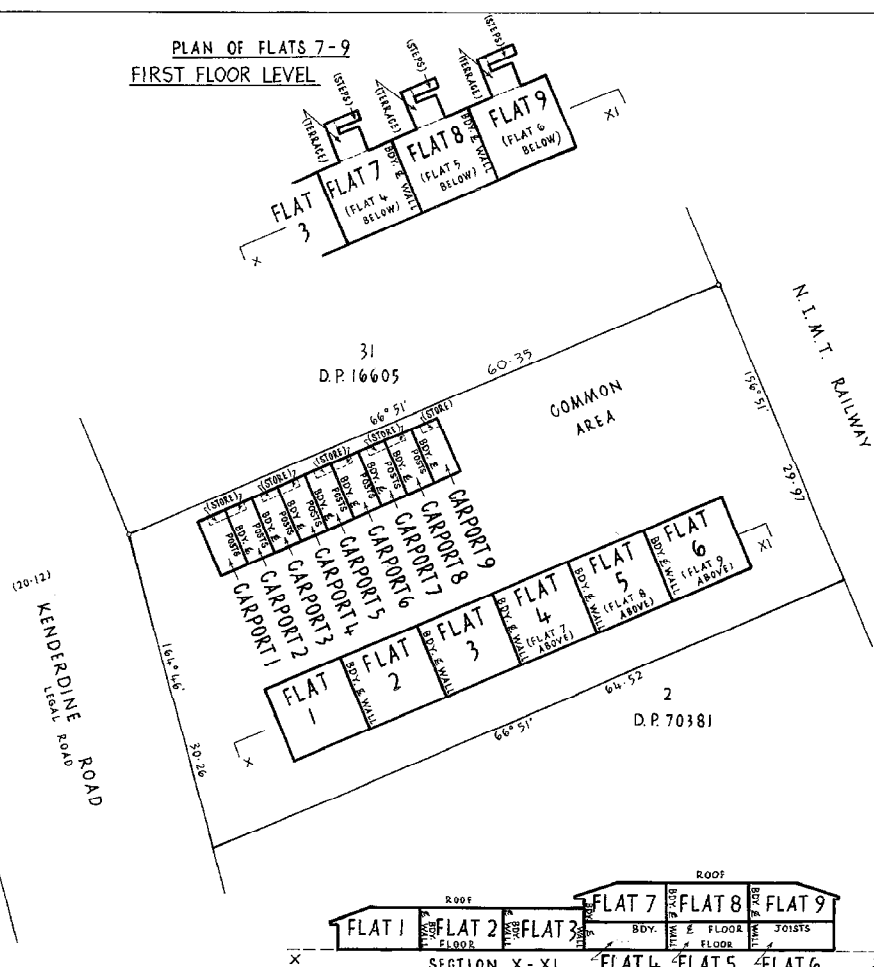
Legal Description Flat 6 Deposited Plan 102387 and Carport
6 Deposited Plan 102387

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I, DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated: *30* this day of *March* 1984
[Signature]

Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 215 1984
 Deposited this 28th day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

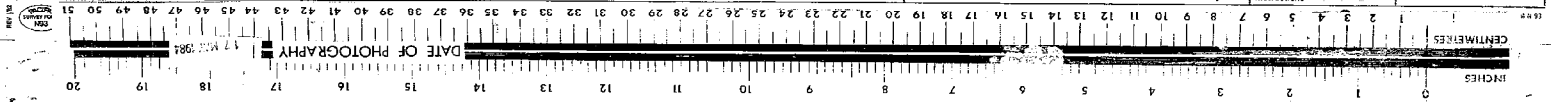
Scale 1:250 Date JANUARY 1984

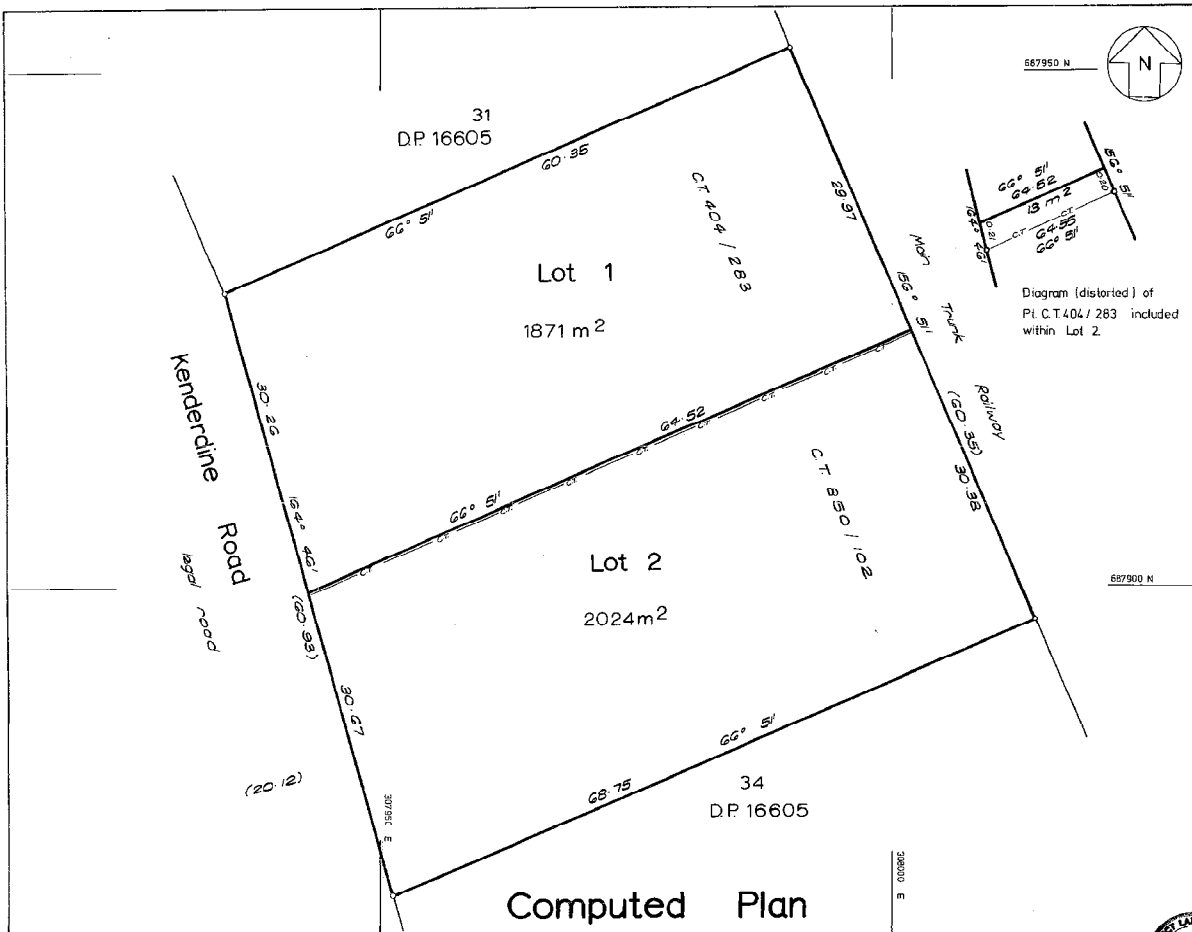
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984

DPI02387





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

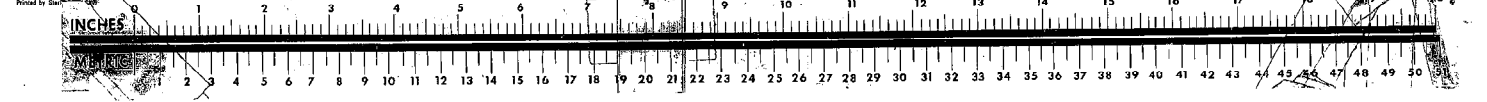
Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Land, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Plan	13 July 1973
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	13 July 73 Assistant Chief Surveyor
Deposited this	22 day of October 1973
Instructions	1/8/73 District Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No.

Subdiv of
Plan of Lots 1&2 being ^ Lots 32 & 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/183**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.10
		Term	999 years commencing on 1.6.1984

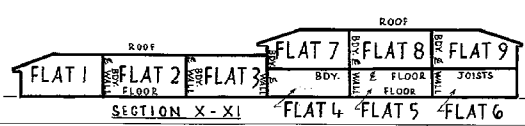
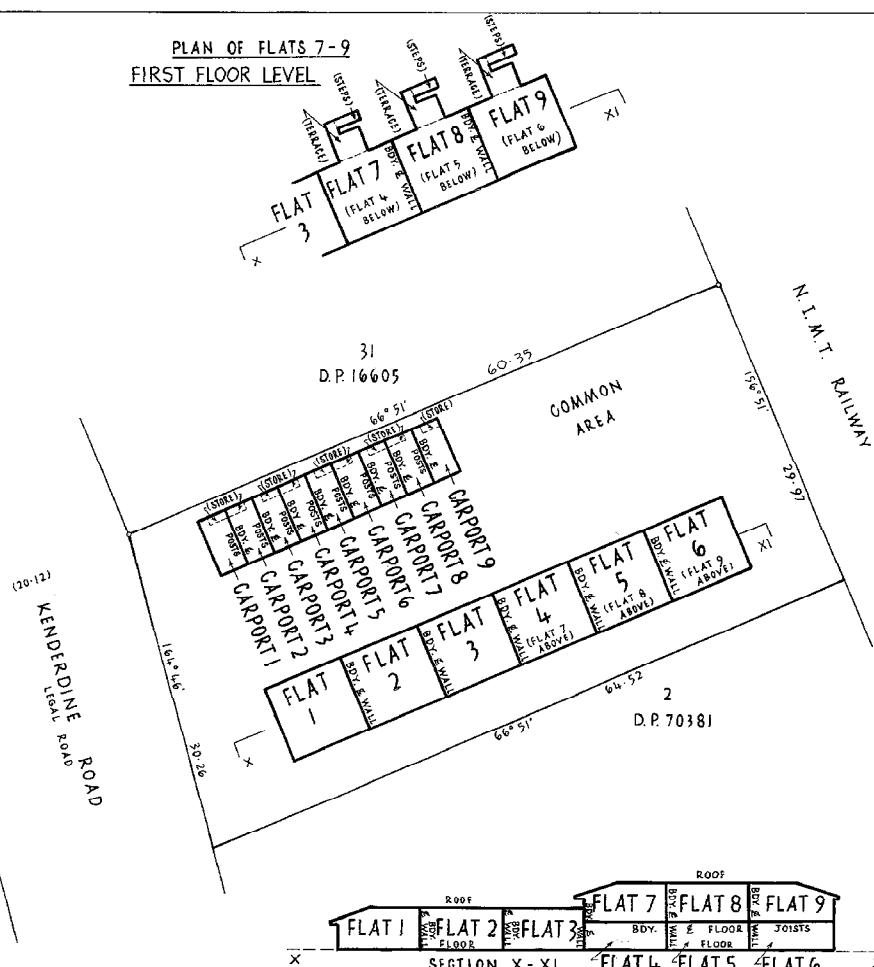
Legal Description Flat 7 Deposited Plan 102387 and Carport
7 Deposited Plan 102387

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 and Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 and Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 and Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 and Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 and Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 and Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 and Carport 7 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984
[Signature] Signature

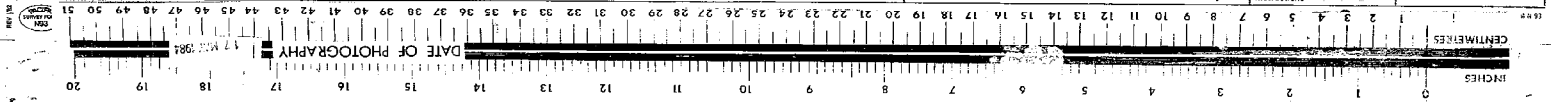
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 7.5.1984
 Deposited this 5th day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

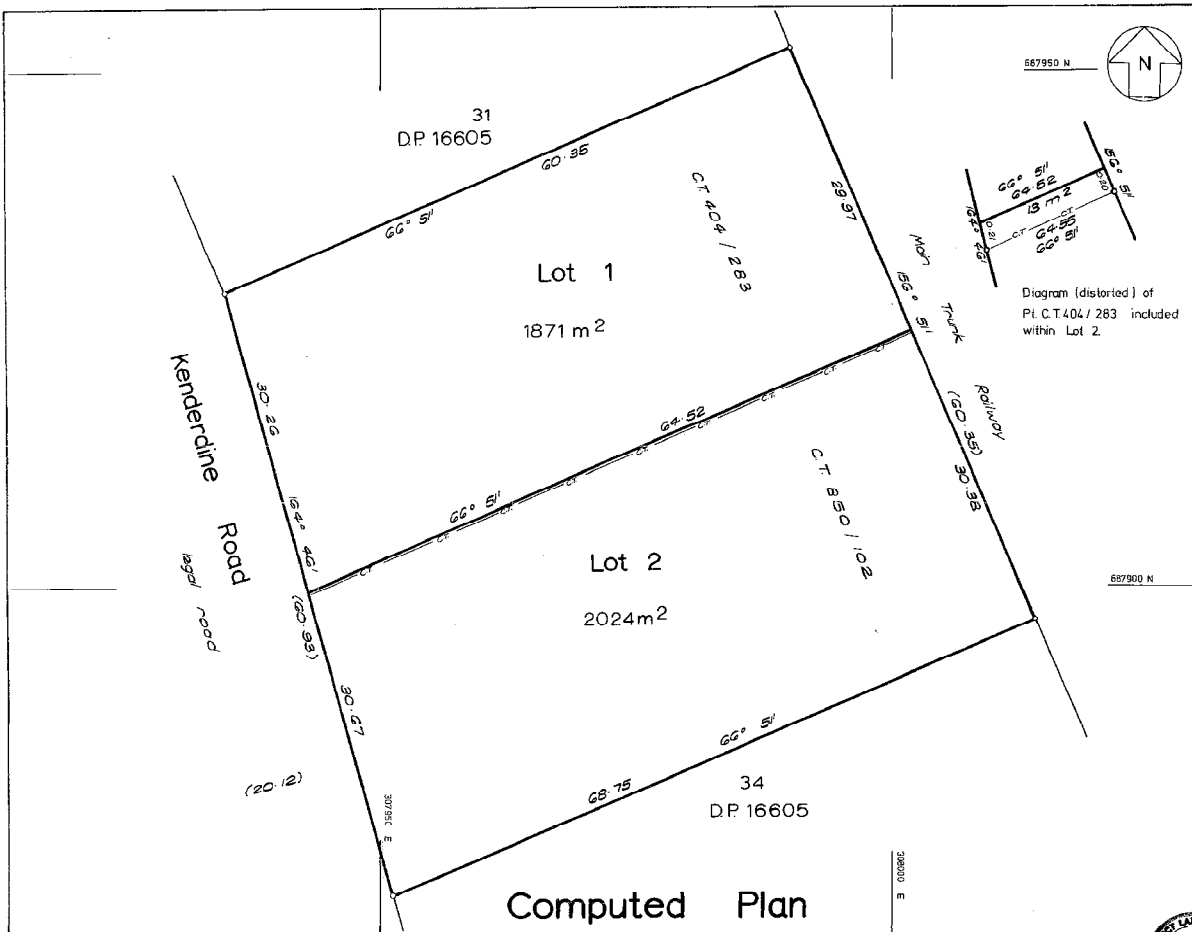
Instructions
 15 APR 84
 DPI02387

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

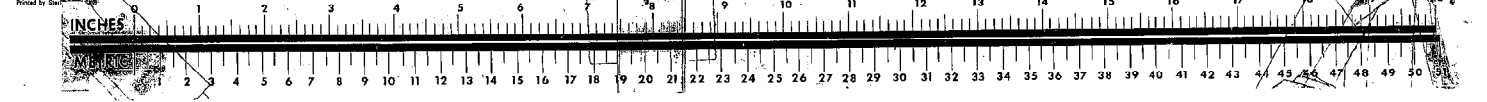
Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Deeds, Registrar General and holder of an annual practicing certificate, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Execution	this 15 th day of September 1973
Signature	<i>[Signature]</i>
Field Book	p. _____ Traverse Book p. _____
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	<i>[Signature]</i>
Date	15/10/73
Position	Assistant Chief Surveyor
Signature	<i>[Signature]</i>
Position	Deputy Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No. _____

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
 Instructions **DP70381**





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/184**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References
NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners
Brian Scott Bailey

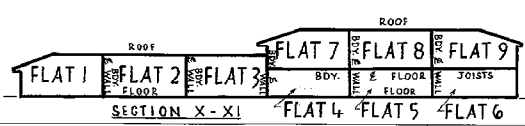
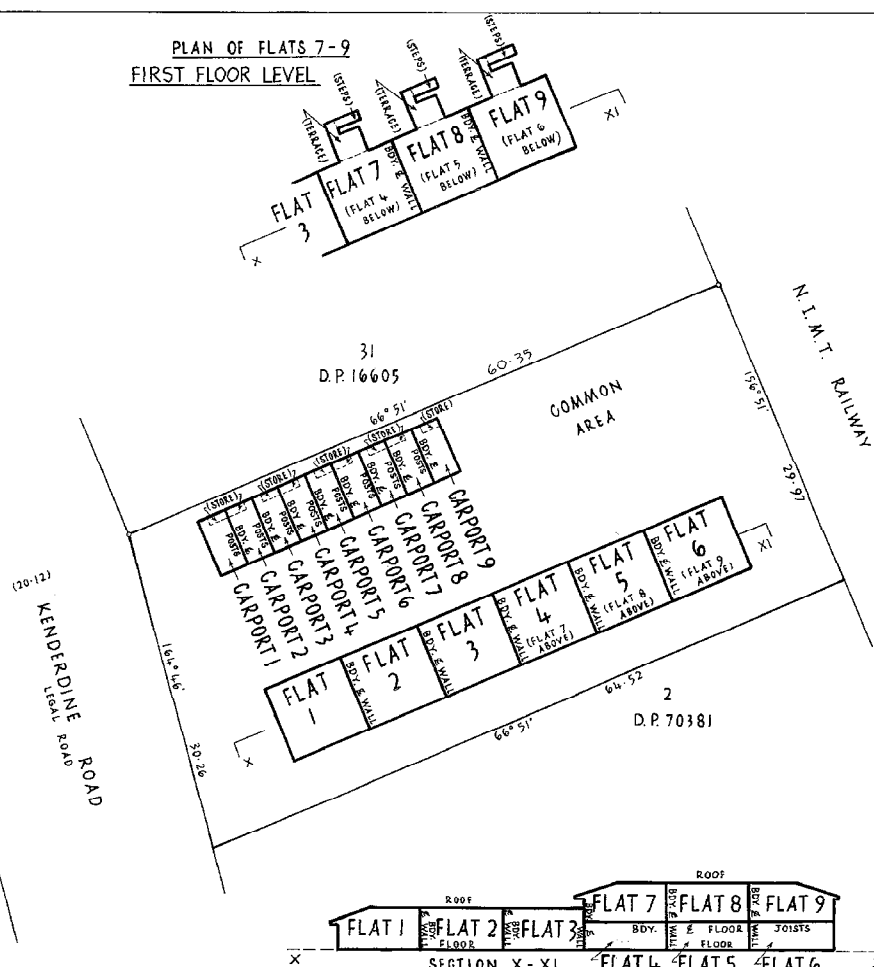
Estate	Leasehold	Instrument	L B316652.11
		Term	999 years commencing on 1.6.1984
Legal Description	Flat 8 Deposited Plan 102387 and Carport 8 Deposited Plan 102387		

Registered Owners
Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 & Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 & Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 & Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 & Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 & Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 & Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 & Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 and Carport 8 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 & Carport 9 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I, DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERRECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practicing certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Surveyors Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984

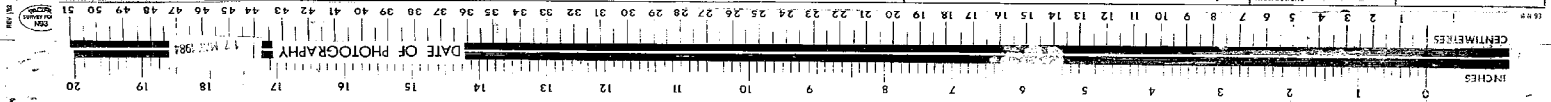
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey *[Signature]*
 FOR THE PURPOSE OF LEASING FLATS ONLY
 7.5.1984
 Deposited this 5th day of May 1984
 Chief Surveyor
 District Land Registrar
 Instructions

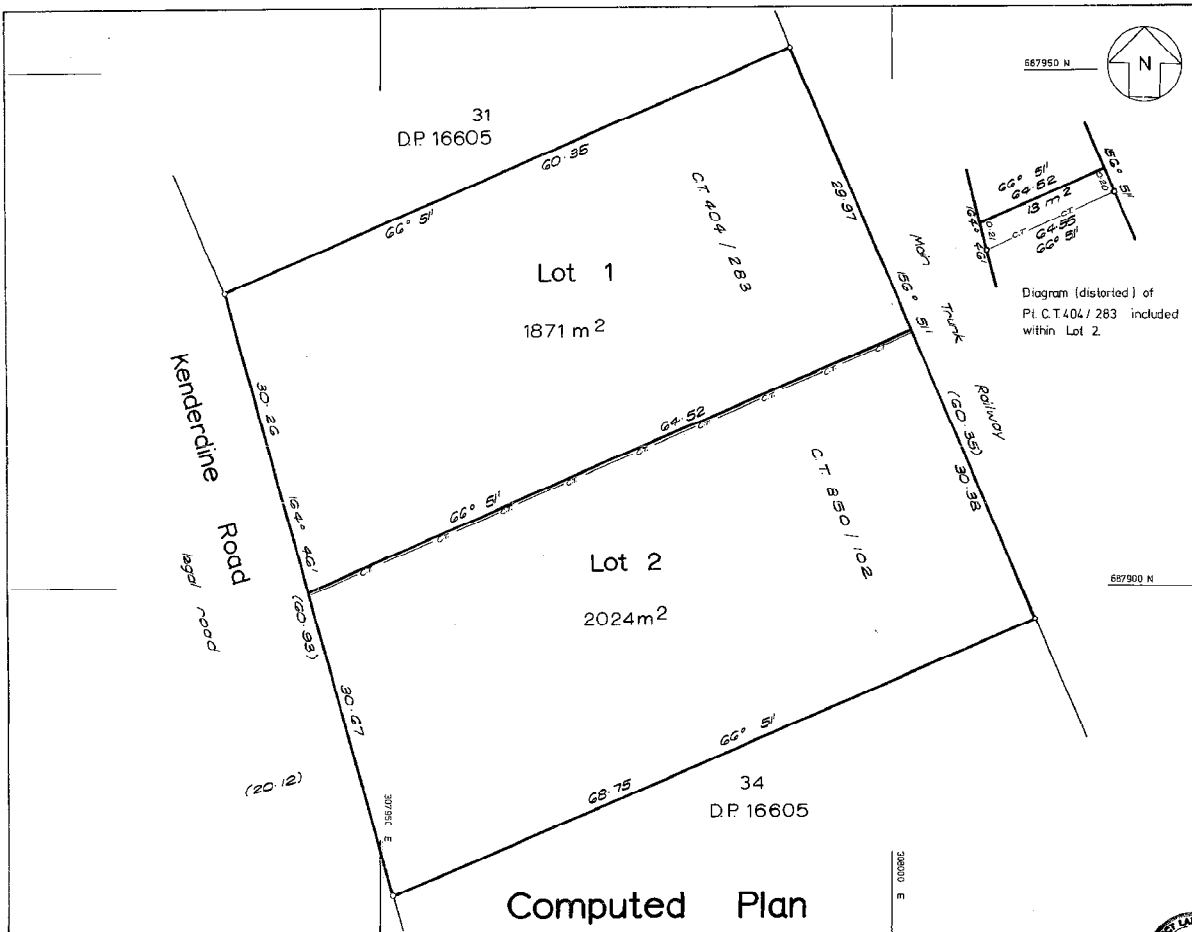
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984

DPI02387





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A/755
 Lot 2 C.T. 27A/756

Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Deeds, Registrar General and holder of an annual practicing certificate, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Execution	this 15 th day of September 1973
Signature	<i>[Signature]</i>
Field Book	p. _____ Traverse Book p. _____
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	<i>[Signature]</i>
Date	15/10/73
Position	Assistant Chief Surveyor
Signature	<i>[Signature]</i>
Position	District Land Registrar

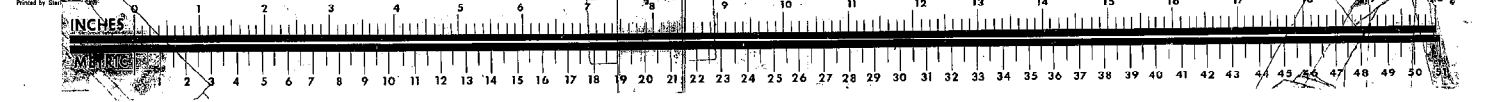
LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No. _____

Subdiv of
Plan of Lots 1&2 being ^ Lots 32 & 33 D.P.16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
[Signature]
 District Land Registrar

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/185**
Land Registration District **North Auckland**
Date Issued 06 August 1984

Prior References

NA27A/755

Estate Fee Simple - 1/9 share
Area 1871 square metres more or less
Legal Description Lot 1 Deposited Plan 70381

Registered Owners

Brian Scott Bailey

Estate	Leasehold	Instrument	L B316652.12
		Term	999 years commencing on 1.6.1984

Legal Description Flat 9 Deposited Plan 102387 and Carport
9 Deposited Plan 102387

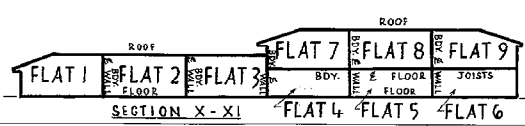
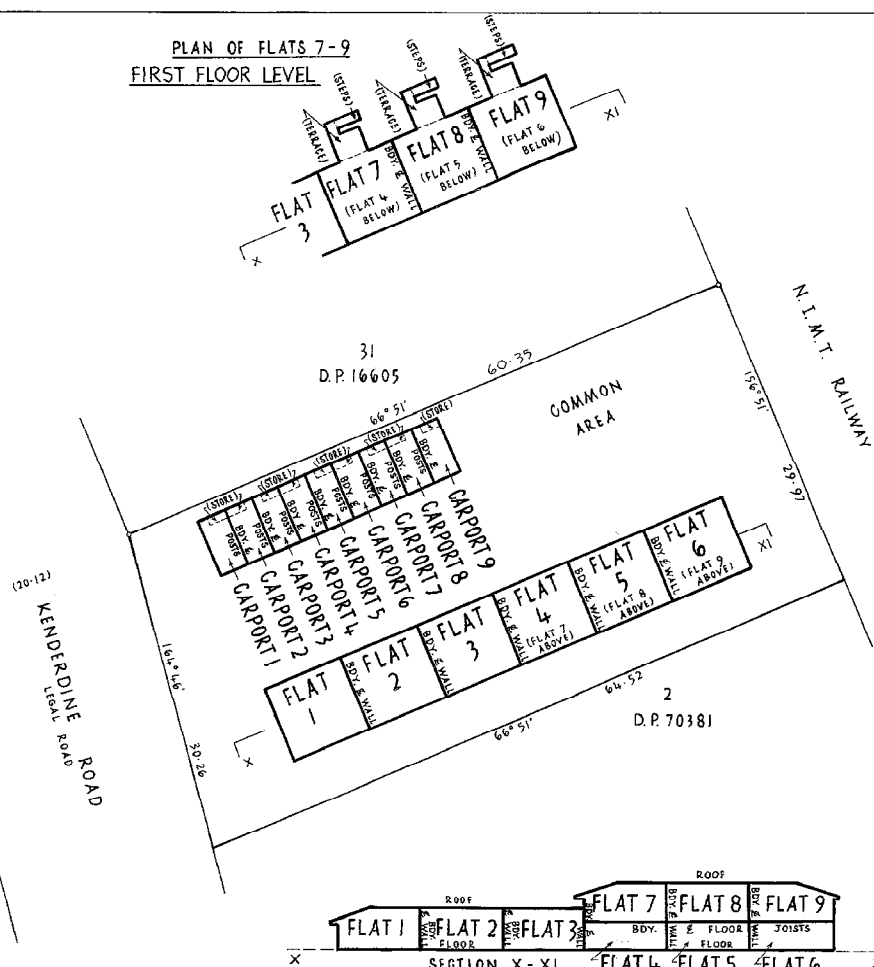
Registered Owners

Brian Scott Bailey

Interests

- Fencing Agreement in Transfer 185332 (Affects Fee Simple)
- B316652.4 Lease of Flat 1 & Carport 1 Composite CT NA56C/177 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.5 Lease of Flat 2 & Carport 2 Composite CT NA56C/178 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.6 Lease of Flat 3 & Carport 3 Composite CT NA56C/179 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.7 Lease of Flat 4 & Carport 4 Composite CT NA56C/180 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.8 Lease of Flat 5 & Carport 5 Composite CT NA56C/181 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.9 Lease of Flat 6 & Carport 6 Composite CT NA56C/182 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.10 Lease of Flat 7 & Carport 7 Composite CT NA56C/183 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.11 Lease of Flat 8 & Carport 8 Composite CT NA56C/184 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- B316652.12 Lease of Flat 9 and Carport 9 DP 102387 Term 999 years commencing on 1.6.1984 Composite CT NA56C/185 issued - 6.8.1984 at 2.46 pm (Affects Fee Simple)
- 5671672.6 Mortgage to The National Bank of New Zealand Limited - 25.7.2003 at 9:00 am

PLAN OF FLATS 7-9
FIRST FLOOR LEVEL



BOUNDARIES OF AREAS TO BE LEASED ARE THE EXTERNAL FACES OF EXTERIOR WALLS (STRUCTURES ROOFS) UNLESS OTHERWISE SHOWN.

PURSUANT TO SECTION 514 OF THE LOCAL GOVERNMENT ACT 1974 I HEREBY CERTIFY THAT THE BUILDINGS DEPICTED HEREON WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN CASE OF FIRE AS WERE REQUIRED BY THE BYLAWS OF THE PAPATOETOE CITY COUNCIL APPLYING AS AT THE DATE OF THIS CERTIFICATE. DATED THIS 30TH DAY OF MARCH 1984.

TOWN CLERK *[Signature]*

I DONALD FLEMING MCKAY OF TAKAPUNA REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE ERRECTED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF C.T. 27A/755 AND THAT THE PLAN IS CORRECT. DATED 30/3/84

[Signature]

NEW GST ALLOCATED
 FLAT 1 - 5CC/177
 FLAT 2 - 5CC/178
 FLAT 3 - 5CC/179
 FLAT 4 - 5CC/180
 FLAT 5 - 5CC/181
 FLAT 6 - 5CC/182
 FLAT 7 - 5CC/183
 FLAT 8 - 5CC/184
 FLAT 9 - 5CC/185

Total Area 1871 m²
 Comprised in C.T. 27A/755 (ALL)

I, *[Signature]* registered surveyor and holder of an annual practicing certificate (or who may act as a registered surveyor pursuant to the proviso to section 22 (2) of the Survey Act 1968) hereby certify that this plan has been made from surveys executed by me or under my direction, and that both plan and survey are correct and have been certified in accordance with the Survey Regulations 1972.

Dated *30* this day of *March* 1984

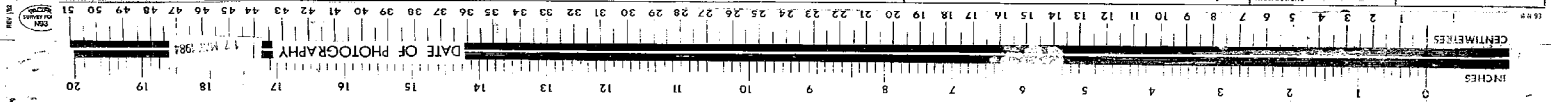
Field Book p. Traverse Book p.
 Reference Plans D.P.s 16605, 70381
 Examined R.G. Blomfield Correct *[Signature]*
 Approved as to Survey for the purpose of leasing flats only
 215 1984
 Deposited this 28th day of May 1984
 for the purpose of leasing flats only
[Signature] Chief Surveyor
[Signature] District Land Registrar

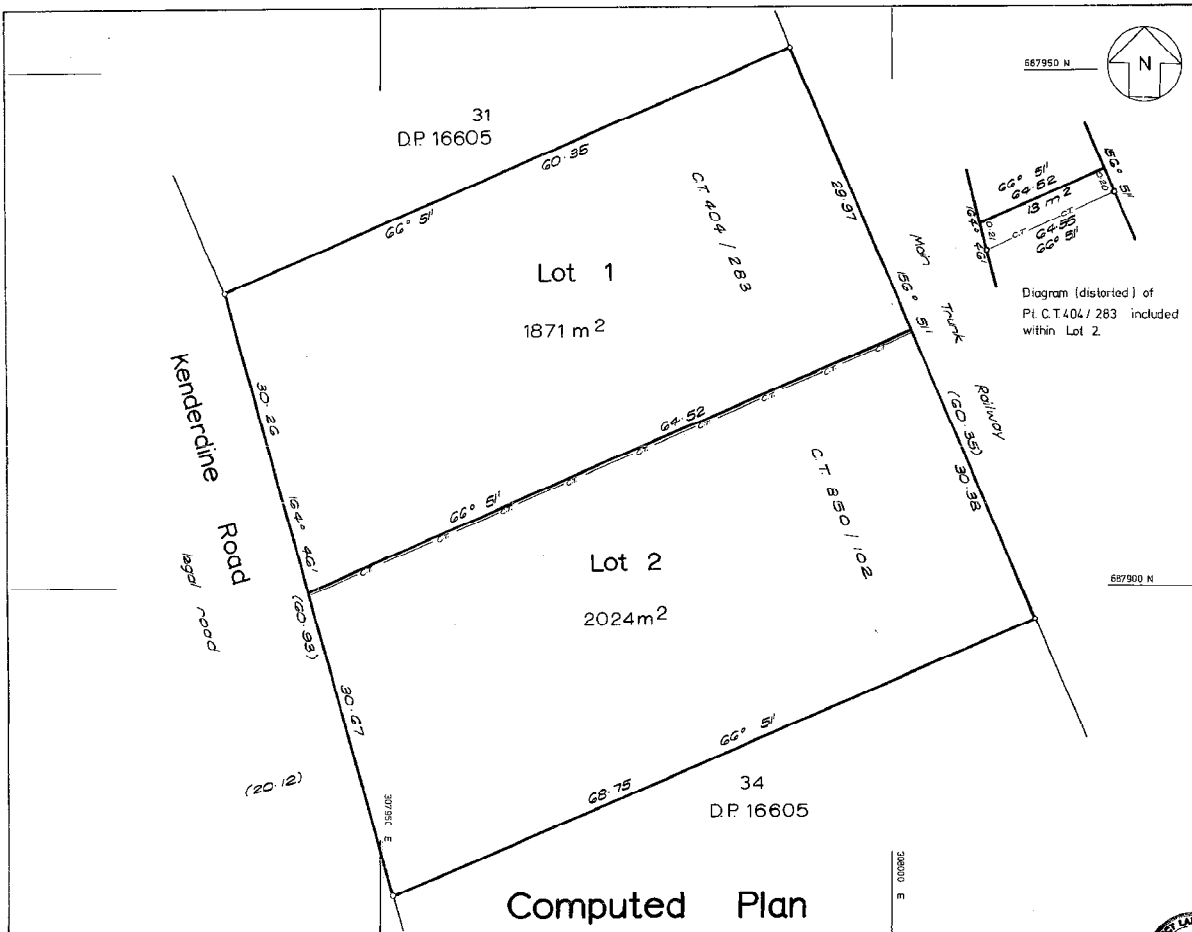
Instructions
 DPIO2387

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET No. Papatoetoe 14

PLAN OF FLATS 1-9 ON LOT 1 D.P. 70381

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. MCKAY & ASSOCIATES
 Scale 1:250 Date JANUARY 1984





Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

Total Area 3895 m²
 Comprised in C.T.'s 404 / 283
 850 / 102

I, Richard E. Eason Registrar of Deeds
 Registrar Surveyor and holder of an annual practicing certificate
 hereby certify that this plan has been made from surveys executed
 by me or under my direction, that both plan and survey are correct
 and have been made in accordance with the regulations under the
 Surveyors Act 1966

Dated at Auckland this 15th day
 of September 1973 Signature [Signature]

Field Book p. Traverse Book p.
 Reference Plans D.P. 16605

Examined K.W. Eason Correct

Approved as to Survey [Signature]
 15/09/73 Assistant Chief Surveyor

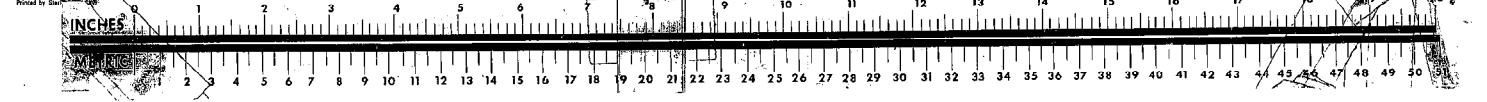
Deposited this 22nd day of October 1973
[Signature] District Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X.
 NZMS SHEET No.

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA27A/756**
Land Registration District **North Auckland**
Date Issued 04 March 1974

Prior References

NA404/283 NA850/102

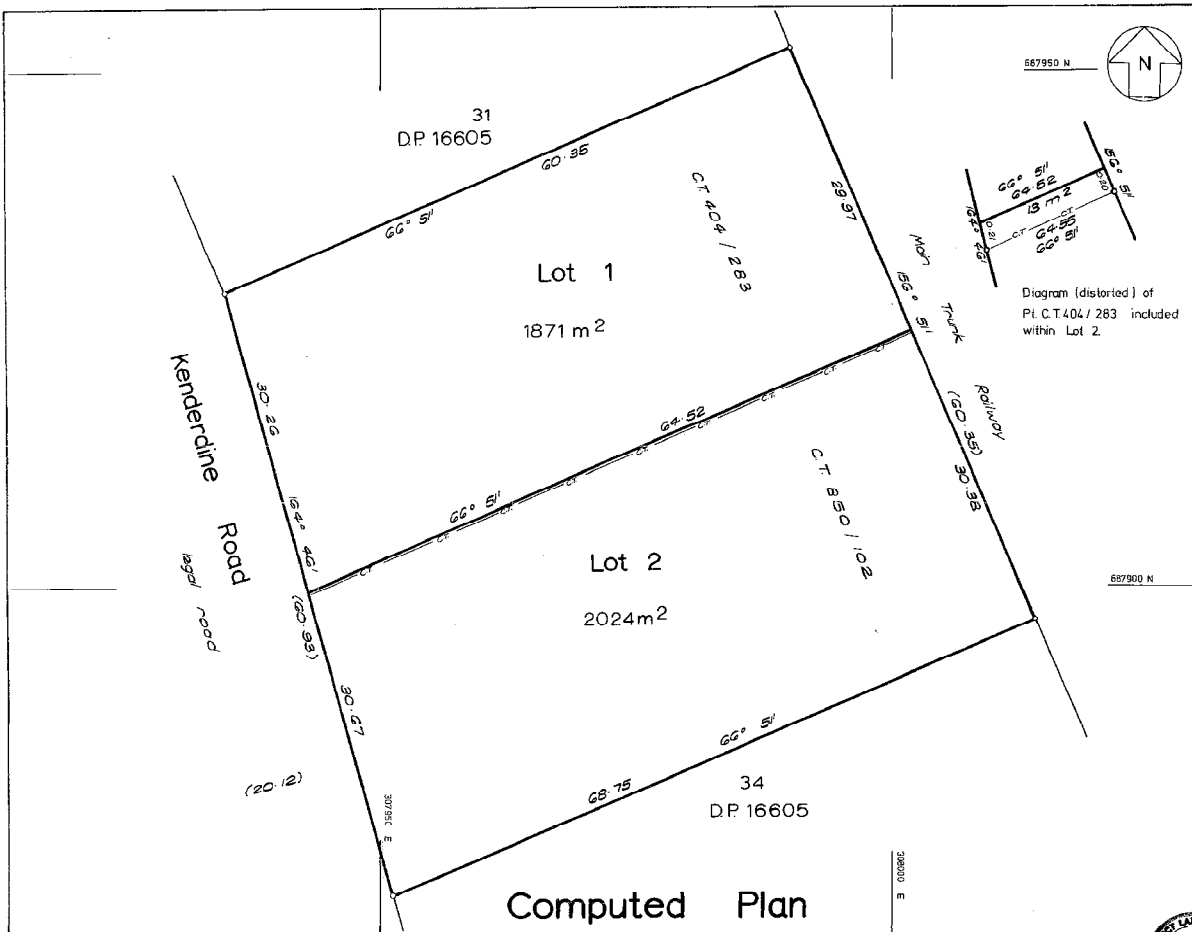
Estate Fee Simple
Area 2024 square metres more or less
Legal Description Lot 2 Deposited Plan 70381

Registered Owners

CLASSIC DESIGNER HOMES LIMITED

Interests

Subject to an electricity transmission right (in gross) over part coloured yellow on Plan 70351 in favour of The Auckland Electric Power Board created by Transfer 070860.2 - 30.7.1974 at 9:01 am
10765734.2 Mortgage to ANZ Bank New Zealand Limited - 27.4.2017 at 6:15 pm



Registered Owner

NEW C.T.s ALLOCATED
 Lot 1 C.T. 27A / 755
 Lot 2 C.T. 27A / 756

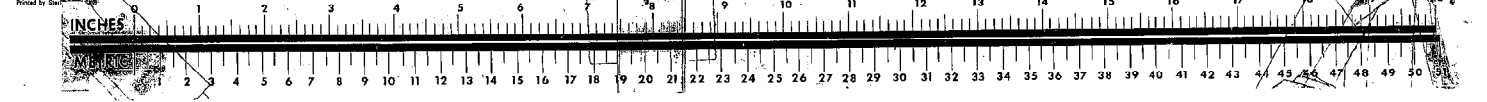
Total Area	3895 m ²
Comprised in	C.T.'s 404 / 283 850 / 102
I, Bruce Harrison, Registrar of Deeds, Registrar General and holder of an annual practicing certificate, hereby certify that this plan has been made from surveys executed by me or under my direction, that both plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1966.	
Date of Execution	this 15 th day of September 1973
Signature	<i>[Signature]</i>
Field Book	p. _____ Traverse Book p. _____
Reference Plans	D.P. 16605
Examined	K.W. Emmons Correct
Approved as to Survey	<i>[Signature]</i>
Date	15/10/73
Position	Assistant Chief Surveyor
Signature	<i>[Signature]</i>
Position	Deputy Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. Otahuhu X
 NZMS SHEET No.

Subdiv of
 Plan of Lots 1&2 being ^ Lots 32 &
 33 D.P. 16605

LOCAL AUTHORITY Papatoetoe City Council
 Surveyed by TRIPP, ANDREWS & PARTNERS
 Scale 1:250 Date July 1973

Deposited this 22nd day of October 1973
[Signature]
 District Land Registrar
DP70381





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/186**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.2
		Term	999 years commencing on 1.6.1984

Legal Description Flat 1 Deposited Plan 102388 and Carport
1 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
B317831.2 Lease of Flat 1 and Carport 1 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
10249353.3 Mortgage to Westpac New Zealand Limited - 18.11.2015 at 3:55 pm



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/187**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.3
		Term	999 years commencing on 1.6.1984

Legal Description Flat 2 Deposited Plan 102388 and Carport
2 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.3 Lease of Flat 2 and Carport 2 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
9718884.4 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/188**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.4
		Term	999 years commencing on 1.6.1984

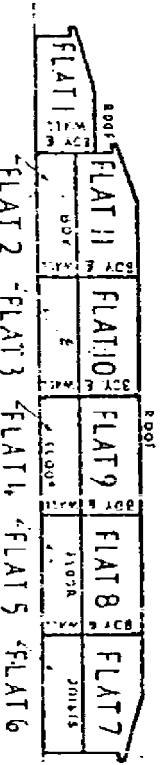
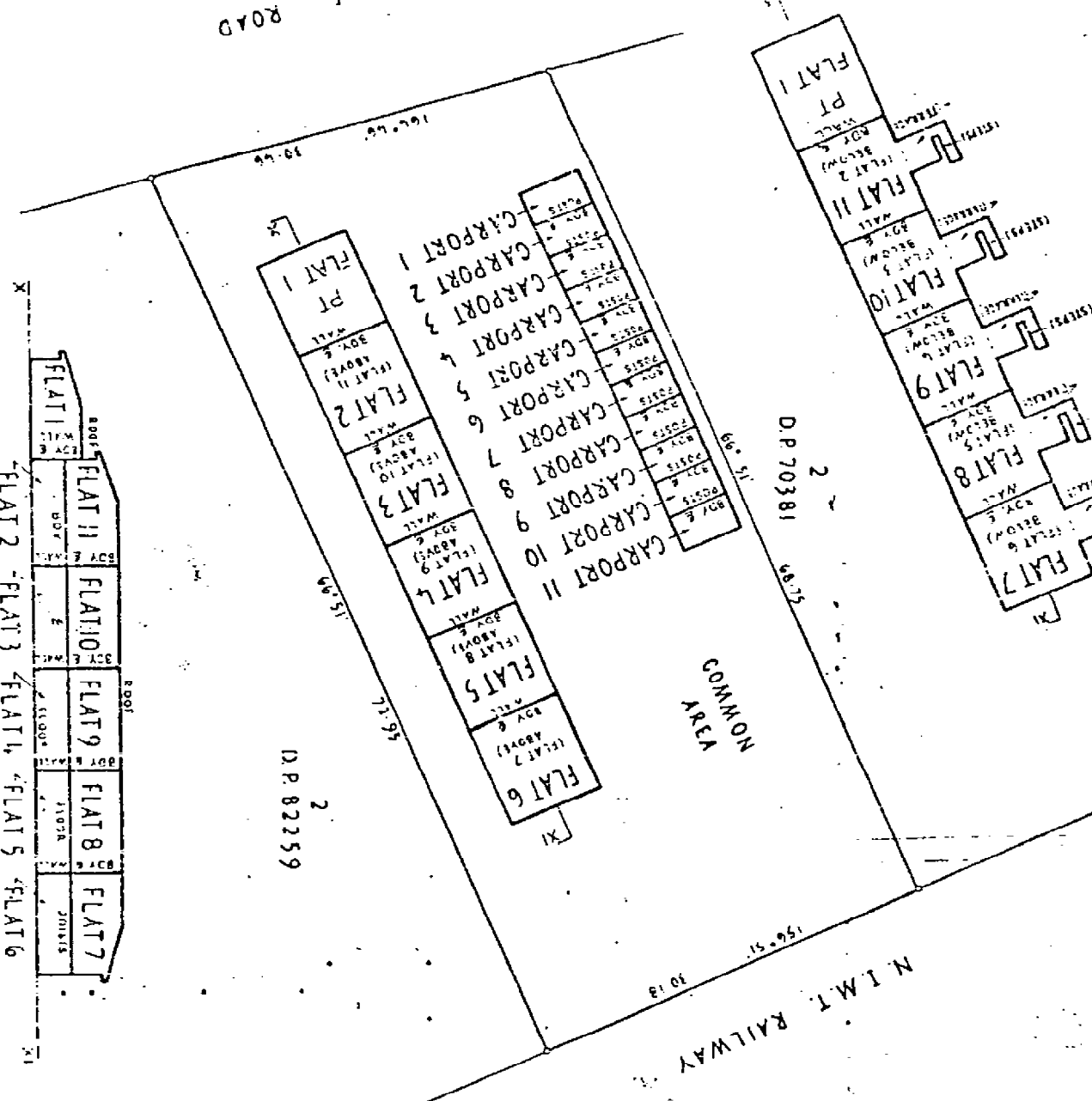
Legal Description Flat 3 Deposited Plan 102388 and Carport
3 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
 B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.4 Lease of Flat 3 and Carport 3 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 9718884.5 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

FIRST FLOOR PLAN



PLAN OF FLATS I-II ON LOT 34, D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY
 Drawn by D.F. MCKAY & ASSOCIATES
 Date JANUARY 1984



YOU OBTAIN THIS PLAN BY THE PAYMENT OF THE FEE OF \$10.00 AND THE FURNISHING OF A COPY OF THE PLAN TO THE LOCAL AUTHORITY. THE LOCAL AUTHORITY WILL BE RESPONSIBLE FOR THE PROVISION OF A COPY OF THE PLAN TO THE LOCAL AUTHORITY. THE LOCAL AUTHORITY WILL BE RESPONSIBLE FOR THE PROVISION OF A COPY OF THE PLAN TO THE LOCAL AUTHORITY.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HAND AND SEAL OF OFFICE ON THIS 15th DAY OF JANUARY 1984.

DAVID J. MCKAY
 D.F. MCKAY & ASSOCIATES

NEW LOT ALLOCATED

FLAT 1	50.0/10.0
FLAT 2	50.0/10.0
FLAT 3	50.0/10.0
FLAT 4	50.0/10.0
FLAT 5	50.0/10.0
FLAT 6	50.0/10.0
FLAT 7	50.0/10.0
FLAT 8	50.0/10.0
FLAT 9	50.0/10.0
FLAT 10	50.0/10.0
FLAT 11	50.0/10.0
FLAT 12	50.0/10.0
FLAT 13	50.0/10.0
FLAT 14	50.0/10.0
FLAT 15	50.0/10.0
FLAT 16	50.0/10.0
FLAT 17	50.0/10.0
FLAT 18	50.0/10.0
FLAT 19	50.0/10.0
FLAT 20	50.0/10.0
FLAT 21	50.0/10.0
FLAT 22	50.0/10.0

Total Area 2137m²
 Comprised in C/T 404/16(1414)

APPROVED AS SHOWN

DAVID J. MCKAY
 D.F. MCKAY & ASSOCIATES

DP 16605

DP 102288



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/189**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.5
		Term	999 years commencing on 1.6.1984

Legal Description Flat 4 Deposited Plan 102388 and Carport
4 Deposited Plan 102388

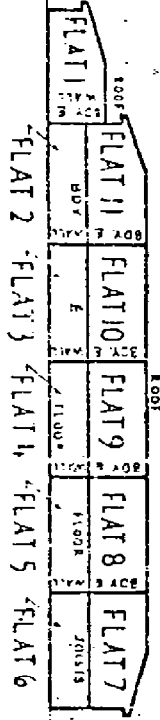
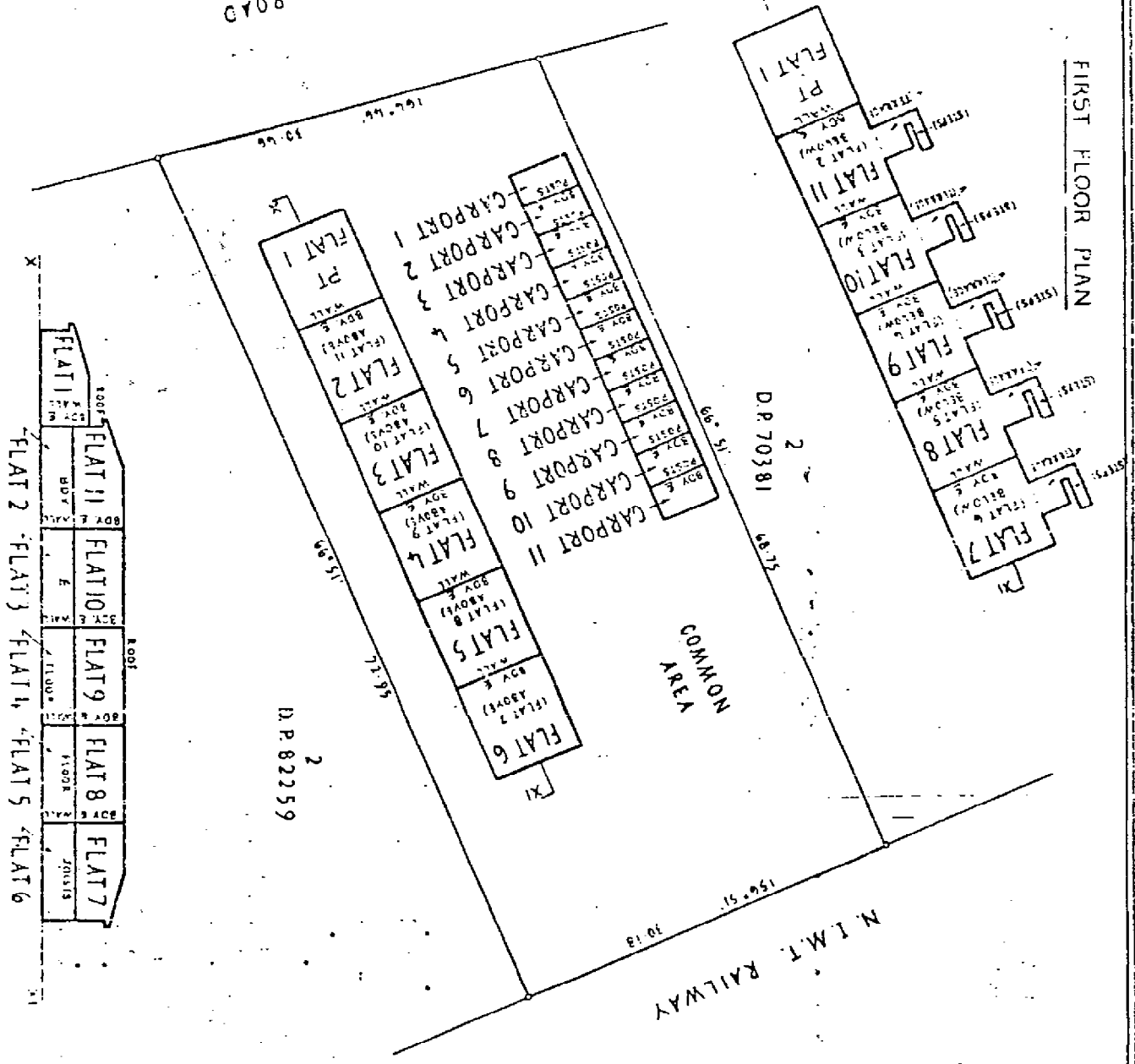
Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
 B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.5 Lease of Flat 4 and Carport 4 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 9718884.6 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

(100 M) KENDERDINE ROAD
155-2040

FIRST FLOOR PLAN



PLAN OF FLATS I-11 ON LOT 34, D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY
Designed by D.E. MCKAY & ASSOCIATES



HOW DATES OF AREAS TO BE USED FOR THE
EXTENT OF AREAS TO BE USED FOR THE
LOCAL AUTHORITY OTHERWISE SHOWN
PURSUANT TO SECTION 116 OF THE LOCAL
GOVERNMENT ACT 1974 (EMERGENCY CLAUSE)
THAT THE BUILDINGS DEPICTED HEREON
WERE CONSTRUCTED BEFORE 1 APRIL 1973
AND WERE PROVIDED WITH SUGGESTED
AGAINST FIRE AND MEANS OF ESCAPE IN
OF THE AS WHEN REQUIRED BY THE BY-LAWS
OF THE PAPATOETOE CITY COUNCIL APPROVED
AS AT THE DATE OF THIS CERTIFICATE
DATED THIS ... DAY OF ... 1964

TOWN CLERK ...

I DONALD HERING MCKAY OF TAKAPUNA
REGISTERED SURVEYOR AND HOLDER OF AN
ANNUAL RECOGNITION CERTIFICATE HEREBY
CERTIFY THAT THE BUILDINGS SHOWN ARE
SITUATED WITHIN THE BOUNDARIES OF
CT 400/1045 AND THAT THE PLANS CORRECT
DATED ...

NEW C/I ASSOCIATED

FLAT 1	200/1045
FLAT 2	200/1045
FLAT 3	200/1045
FLAT 4	200/1045
FLAT 5	200/1045
FLAT 6	200/1045
FLAT 7	200/1045
FLAT 8	200/1045
FLAT 9	200/1045
FLAT 10	200/1045
FLAT 11	200/1045

Total Area 2137 m²
Limpitied in CT 404/164 (A1)

APPROVED BY THE LOCAL AUTHORITY
FOR THE PURPOSES OF THE LOCAL GOVERNMENT ACT 1974
ON ...

APPROVED BY THE LOCAL AUTHORITY
FOR THE PURPOSES OF THE LOCAL GOVERNMENT ACT 1974
ON ...

DP 16228E



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



Identifier **NA56C/190**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.6
		Term	999 years commencing on 1.6.1984

Legal Description Flat 5 Deposited Plan 102388 and Carport
5 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

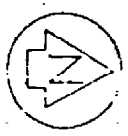
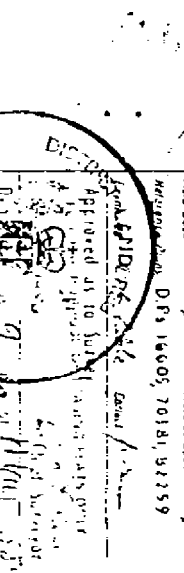
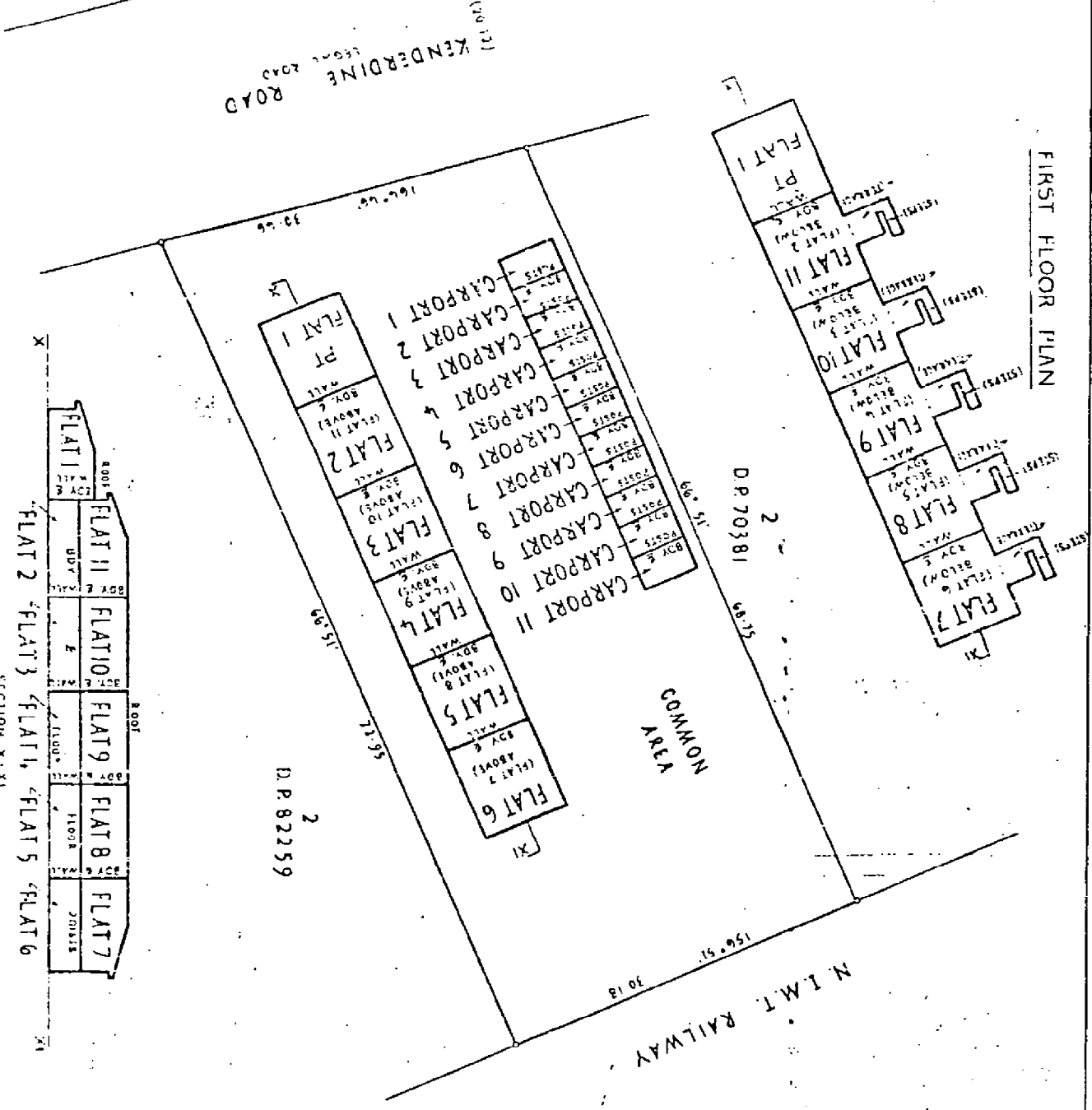
- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.6 Lease of Flat 5 and Carport 5 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
9718884.7 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

PLAN OF FLATS I-II ON LOT 34, D.P. 16605

PLAN OF FLATS I-II ON LOT 34, D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY

Surveyed by DE WICKAY & ASSOCIATES
Date JANUARY 1984



YOU HEREBY CERTIFY THAT THE BUILDINGS SHOWN ON THIS PLAN WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN ACCORDANCE WITH THE BUILDING REGULATIONS OF THE PAPATOETOE CITY COUNCIL AS AT THE DATE OF THIS CERTIFICATE.

DATED THIS 30th DAY OF JANUARY 1984

TOWN CLERK

I DONALD ILLINGWICK DE WICKAY & ASSOCIATES REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE LOCATED WITHIN THE BOUNDARIES OF LOT 34/10/10/10 AND THAT THE PLAN IS CORRECT DATED 20/1/84

NEW LOT ALLOCATED

FLAT 1	500/100
FLAT 2	500/100
FLAT 3	500/100
FLAT 4	500/100
FLAT 5	500/100
FLAT 6	500/100
FLAT 7	500/100
FLAT 8	500/100
FLAT 9	500/100
FLAT 10	500/100
FLAT 11	500/100
FLAT 12	500/100

Total Area 2137m²
Comprised in CT 404/1641411

APPROVED AS TO THE CORRECTNESS OF THE INFORMATION CONTAINED HEREIN FOR THE PURPOSES OF THE PROVISION OF A CERTIFICATE OF TITLE BY THE LAND REGISTRATION ACT 1974, I HEREBY CERTIFY THAT THE BUILDINGS SHOWN ON THIS PLAN WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN ACCORDANCE WITH THE BUILDING REGULATIONS OF THE PAPATOETOE CITY COUNCIL AS AT THE DATE OF THIS CERTIFICATE.

DATED THIS 30th DAY OF JANUARY 1984

TOWN CLERK

APPROVED AS TO THE CORRECTNESS OF THE INFORMATION CONTAINED HEREIN FOR THE PURPOSES OF THE PROVISION OF A CERTIFICATE OF TITLE BY THE LAND REGISTRATION ACT 1974, I HEREBY CERTIFY THAT THE BUILDINGS SHOWN ON THIS PLAN WERE PROVIDED WITH SUCH SAFEGUARDS AGAINST FIRE AND MEANS OF ESCAPE IN ACCORDANCE WITH THE BUILDING REGULATIONS OF THE PAPATOETOE CITY COUNCIL AS AT THE DATE OF THIS CERTIFICATE.

DATED THIS 30th DAY OF JANUARY 1984

TOWN CLERK

DP 102388



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/191**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners

John Maka

Estate	Leasehold	Instrument	L B317831.7
		Term	999 years commencing on 1.6.1984

Legal Description Flat 6 Deposited Plan 102388 and Carport
6 Deposited Plan 102388

Registered Owners

John Maka

Interests

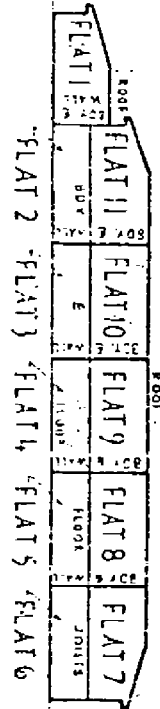
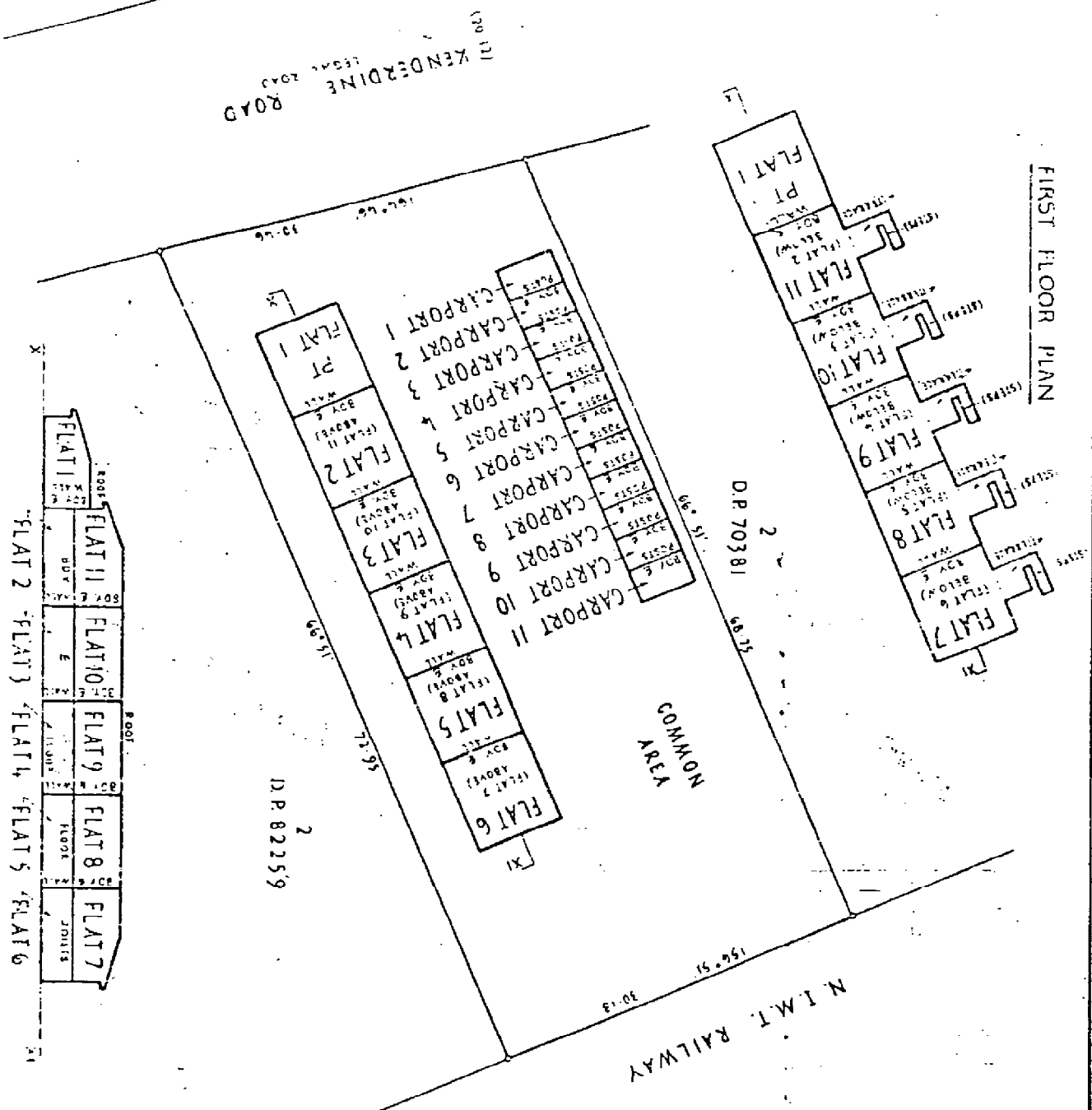
- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 and Carport 6 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - C502283.2 Mortgage to Bank of New Zealand - 28.7.1993 at 2:52 pm

CERTIFICATE OF TITLE No.

PLAN OF FLATS 1-11 ON LOT 34, D.P. 16605

LOCAL AUTHORITY PAPAROTOE CITY

Designed by D.F. MCKAY & ASSOCIATES



APPROVED BY THE LOCAL AUTHORITY
 Approved at 19 June 1984
 D.F. MCKAY & ASSOCIATES
 D.P. 16605

Section 223 of the Resource Management Act 1976
 The Local Authority hereby certifies that the information contained in this certificate is true and correct to the best of its knowledge and belief.

Total Area 2137m²
 Comprised in C.T. 404/104 (141)

NEW C.T. ALLOCATED

FLAT 1	200/100
FLAT 2	200/100
FLAT 3	200/100
FLAT 4	200/100
FLAT 5	200/100
FLAT 6	200/100
FLAT 7	200/100
FLAT 8	200/100
FLAT 9	200/100
FLAT 10	200/100
FLAT 11	200/100

TOWN CLERK
 DONALD FITZGERALD
 I, DONALD FITZGERALD, Town Clerk of the Paparotoe City Council, do hereby certify that the information contained in this certificate is true and correct to the best of my knowledge and belief.

AND WHEREAS the said information is contained in the plans and documents deposited in the office of the Registrar of Land and the said information is contained in the plans and documents deposited in the office of the Registrar of Land and the said information is contained in the plans and documents deposited in the office of the Registrar of Land.



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/192**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.8
		Term	999 years commencing on 1.6.1984

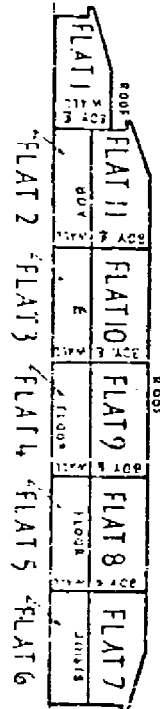
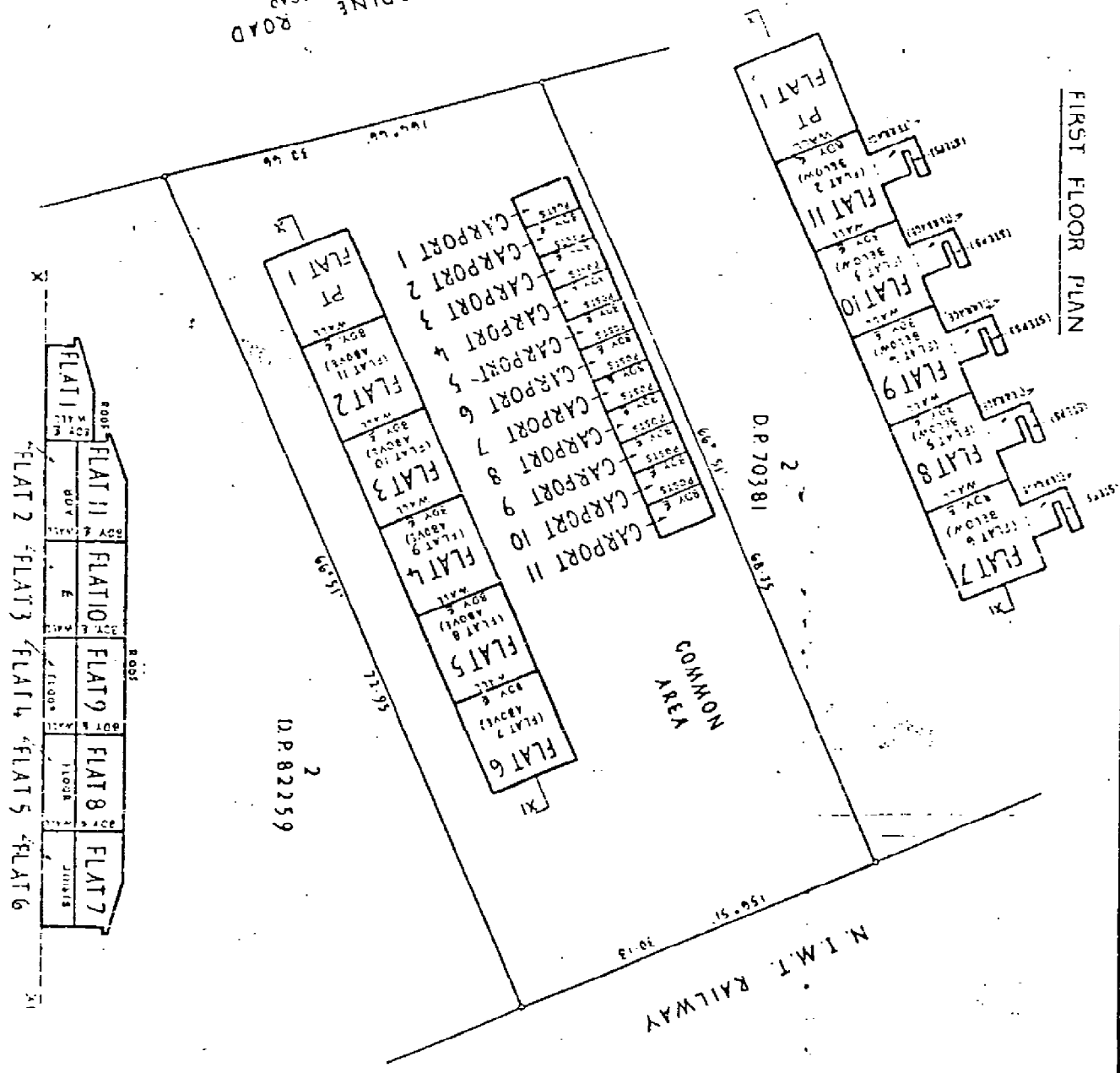
Legal Description Flat 7 Deposited Plan 102388 and Carport
7 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 and Carport 7 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - 9718884.11 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

FIRST FLOOR PLAN



PLAN OF FLATS 1-11 ON LOT 34, D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY
 Drawn by D.F. MCKAY & ASSOCIATES



YOU OBTAIN THIS SECTION 51 OF THE LOCAL GOVERNMENT ACT 1974, I HEREBY CERTIFY THAT THE BUILDINGS DIRECTED BY SUCH BY-LAW CONSISTED OF 10 FLATS, 10 CARPORTS AND WERE PROVIDED WITH SUCH STRUCTURE AGAINST FIRE AND MEANS OF ESCAPE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ACT AS AT THE DATE OF THIS CERTIFICATE.

DATED THIS 30th DAY OF DECEMBER 1978
 TOWN CLERK

I, DONALD FLEMING MCKAY OF TAKAPUNA, REGISTERED SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFY THAT THE BUILDINGS SHOWN ARE SITUATED IN THE POSITION SHOWN AND ARE SITUATED WITHIN THE BOUNDARIES OF LOT 34, D.P. 16605, AND THAT THE PLANS CORRECTLY SHOW THE POSITION OF THE BUILDINGS AND CARPORTS.

DATED 30/12/78

NEW LOT ASSOCIATED

FLAT 1	50sqm
FLAT 2	50sqm
FLAT 3	50sqm
FLAT 4	50sqm
FLAT 5	50sqm
FLAT 6	50sqm
FLAT 7	50sqm
FLAT 8	50sqm
FLAT 9	50sqm
FLAT 10	50sqm
FLAT 11	50sqm
FLAT 12	50sqm
FLAT 13	50sqm
FLAT 14	50sqm
FLAT 15	50sqm
FLAT 16	50sqm
FLAT 17	50sqm
FLAT 18	50sqm
FLAT 19	50sqm
FLAT 20	50sqm
FLAT 21	50sqm
FLAT 22	50sqm
FLAT 23	50sqm
FLAT 24	50sqm
FLAT 25	50sqm
FLAT 26	50sqm
FLAT 27	50sqm
FLAT 28	50sqm
FLAT 29	50sqm
FLAT 30	50sqm
FLAT 31	50sqm
FLAT 32	50sqm
FLAT 33	50sqm
FLAT 34	50sqm
FLAT 35	50sqm
FLAT 36	50sqm
FLAT 37	50sqm
FLAT 38	50sqm
FLAT 39	50sqm
FLAT 40	50sqm
FLAT 41	50sqm
FLAT 42	50sqm
FLAT 43	50sqm
FLAT 44	50sqm
FLAT 45	50sqm
FLAT 46	50sqm
FLAT 47	50sqm
FLAT 48	50sqm
FLAT 49	50sqm
FLAT 50	50sqm
FLAT 51	50sqm
FLAT 52	50sqm
FLAT 53	50sqm
FLAT 54	50sqm
FLAT 55	50sqm
FLAT 56	50sqm
FLAT 57	50sqm
FLAT 58	50sqm
FLAT 59	50sqm
FLAT 60	50sqm
FLAT 61	50sqm
FLAT 62	50sqm
FLAT 63	50sqm
FLAT 64	50sqm
FLAT 65	50sqm
FLAT 66	50sqm
FLAT 67	50sqm
FLAT 68	50sqm
FLAT 69	50sqm
FLAT 70	50sqm
FLAT 71	50sqm
FLAT 72	50sqm
FLAT 73	50sqm
FLAT 74	50sqm
FLAT 75	50sqm
FLAT 76	50sqm
FLAT 77	50sqm
FLAT 78	50sqm
FLAT 79	50sqm
FLAT 80	50sqm
FLAT 81	50sqm
FLAT 82	50sqm
FLAT 83	50sqm
FLAT 84	50sqm
FLAT 85	50sqm
FLAT 86	50sqm
FLAT 87	50sqm
FLAT 88	50sqm
FLAT 89	50sqm
FLAT 90	50sqm
FLAT 91	50sqm
FLAT 92	50sqm
FLAT 93	50sqm
FLAT 94	50sqm
FLAT 95	50sqm
FLAT 96	50sqm
FLAT 97	50sqm
FLAT 98	50sqm
FLAT 99	50sqm
FLAT 100	50sqm

Total Area 2137 m²
 Comprised in C.T. 404/166(1A11)

APPROVED FOR THE LOCAL AUTHORITY BY THE TOWN CLERK ON 30/12/78

APPROVED AS TO THE CORRECTNESS OF THE PLAN BY THE SURVEYOR GENERAL ON 30/12/78



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/193**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.9
		Term	999 years commencing on 1.6.1984

Legal Description Flat 8 Deposited Plan 102388 and Carport
8 Deposited Plan 102388

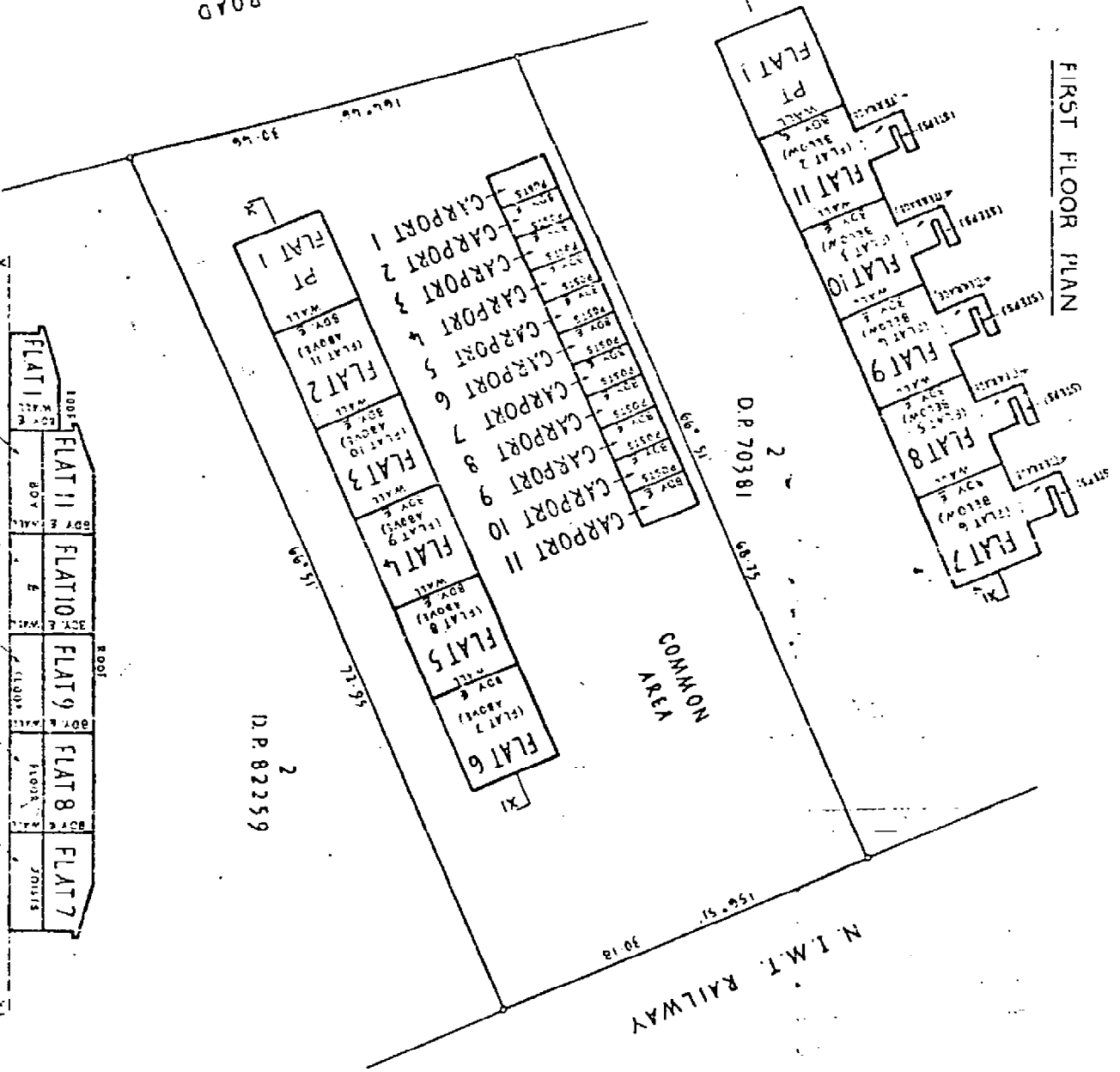
Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 and Carport 8 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - 9718884.8 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

CERTIFICATE OF TITLE No. _____

FIRST FLOOR PLAN



PLAN OF FLATS 1-11 ON LOT 34, D.P. 16605

SECTION X-XI



LOCAL AUTHORITY PAPATOETOE CITY

Surveyed by DE MCKAY & ASSOCIATES

Date JANUARY 1965

DP 102288

Kenderdine & Co. Ltd.
 Engineers & Architects
 102, Victoria Street
 Auckland, N.Z.
 Approved as to form and content for registration in the Land Registry Act 1949.

Section 220(1)(a) of the Land Registry Act 1949.
 Registered under D.P. 16605, 70381, 92159.
 Total Area 2137m²
 Comprised in C.T. 404/1641411

NEW C.T. ASSOCIATED

FLAT 1	562/1107
FLAT 2	562/1107
FLAT 3	562/1107
FLAT 4	562/1107
FLAT 5	562/1107
FLAT 6	562/1107
FLAT 7	562/1107
FLAT 8	562/1107
FLAT 9	562/1107
FLAT 10	562/1107
FLAT 11	562/1107

YOU OBTAIN THIS CERTIFICATE OF TITLE AS A RESULT OF THE REGISTRATION OF THE PLAN OF FLATS 1-11 ON LOT 34, D.P. 16605, 70381, 92159, IN THE LAND REGISTRY ACT 1949. THE BUILDINGS SHOWN ON THE PLAN WERE CONSTRUCTED BEFORE 1 APRIL 1979 AND WERE PROVIDED WITH SUCH STRUCTURES AGAINST FIRE AND MEANS OF ESCAPE IN ACCORDANCE WITH THE REQUIREMENTS OF THE PAPATOETOE CITY COUNCIL APPLICATION AS AT THE DATE OF THIS CERTIFICATE.

DATED THIS 23rd DAY OF FEBRUARY 1965.

TOWN CLERK
 DONALD ILLINGWORTH
 REGULARLY SURVEYOR AND HOLDER OF AN ANNUAL PRACTISING CERTIFICATE HEREBY CERTIFIED IN THE POSITION SHOWN AND RESIDING WITHIN THE BOUNDARIES OF C.T. 404/1641411 AND THAT THE PLAN IS CORRECT.

DATED 23/2/65



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/194**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.10
		Term	999 years commencing on 1.6.1984

Legal Description Flat 9 Deposited Plan 102388 and Carport
9 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

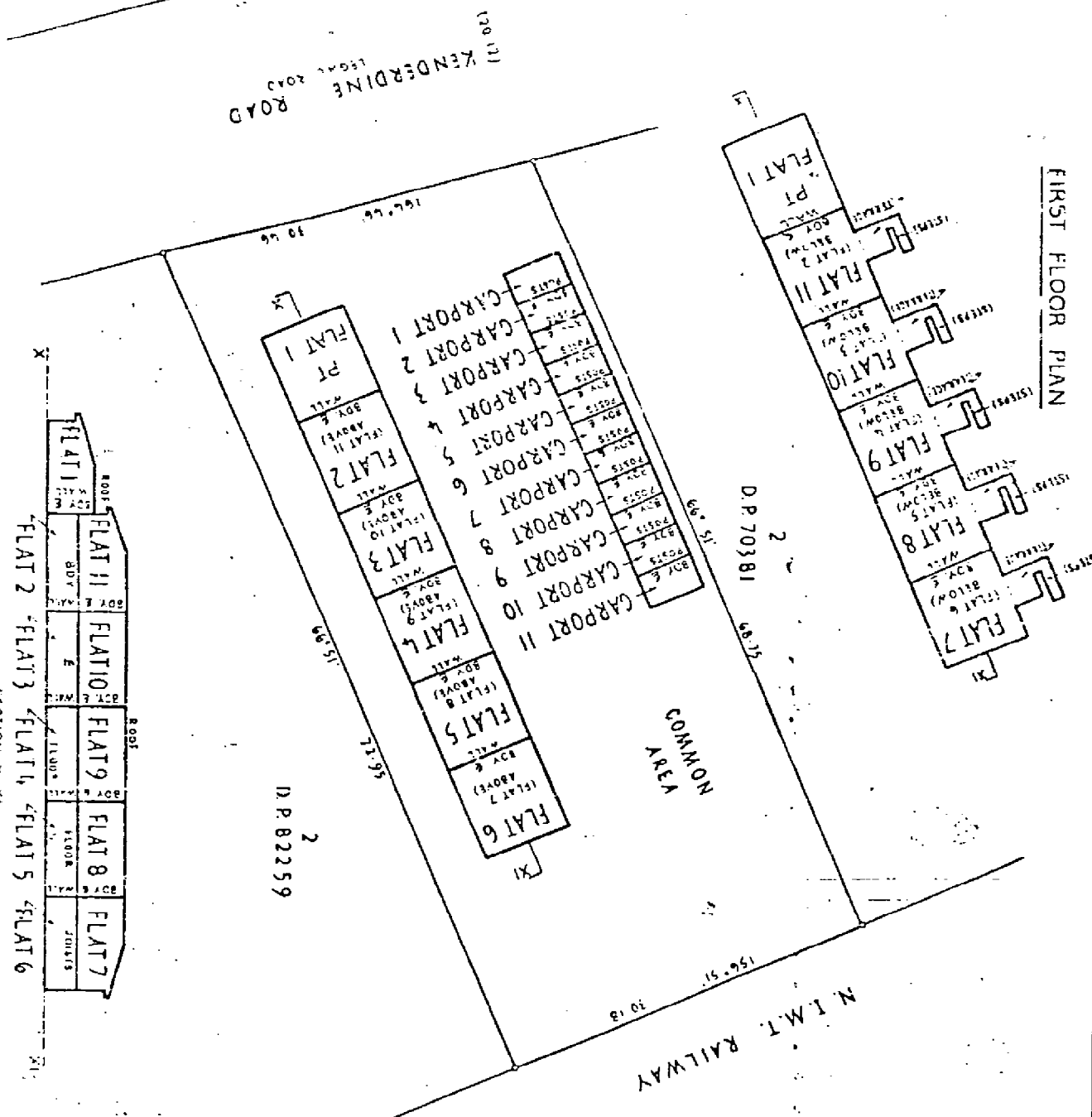
- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 and Carport 9 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - 9718884.9 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

CERTIFICATE OF TITLE No. /

SECTION X-21
 NORTH AUSTRALIAN
 7 011-0110

PLAN OF FLATS 1-11 ON LOT 34 D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.E. MCKAY & ASSOCIATES
 Date JANUARY 1988



SECTION X-21
 FLAT 11
 FLAT 10
 FLAT 9
 FLAT 8
 FLAT 7
 FLAT 6
 FLAT 5
 FLAT 4
 FLAT 3
 FLAT 2
 FLAT 1

NEW GST ALLOCATED
 FLAT 1 200/100
 FLAT 2 200/100
 FLAT 3 200/100
 FLAT 4 200/100
 FLAT 5 200/100
 FLAT 6 200/100
 FLAT 7 200/100
 FLAT 8 200/100
 FLAT 9 200/100
 FLAT 10 200/100
 FLAT 11 200/100

Total Area 2137 m²
 Comprised in C.T. 404/1641411

YOU HEREBY CERTIFY THAT THE BUILDINGS SHOWN ON THIS PLAN WERE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS IN FORCE AT THE DATE OF THIS CERTIFICATE. THE BUILDINGS SHOWN ON THIS PLAN WERE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS IN FORCE AT THE DATE OF THIS CERTIFICATE. THE BUILDINGS SHOWN ON THIS PLAN WERE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS IN FORCE AT THE DATE OF THIS CERTIFICATE.

LICENCE
 Approved as to form and content by the Registrar of Deeds
 D.P. 16605, 70181, 82259
 D.P. 102388



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/195**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.11
		Term	999 years commencing on 1.6.1984

Legal Description Flat 10 Deposited Plan 102388 and
Carport 10 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

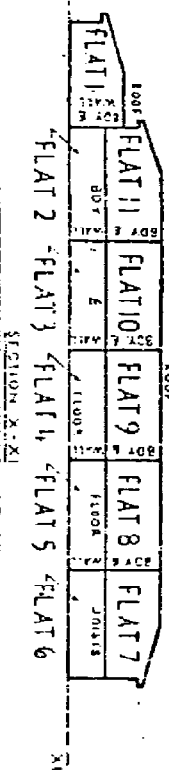
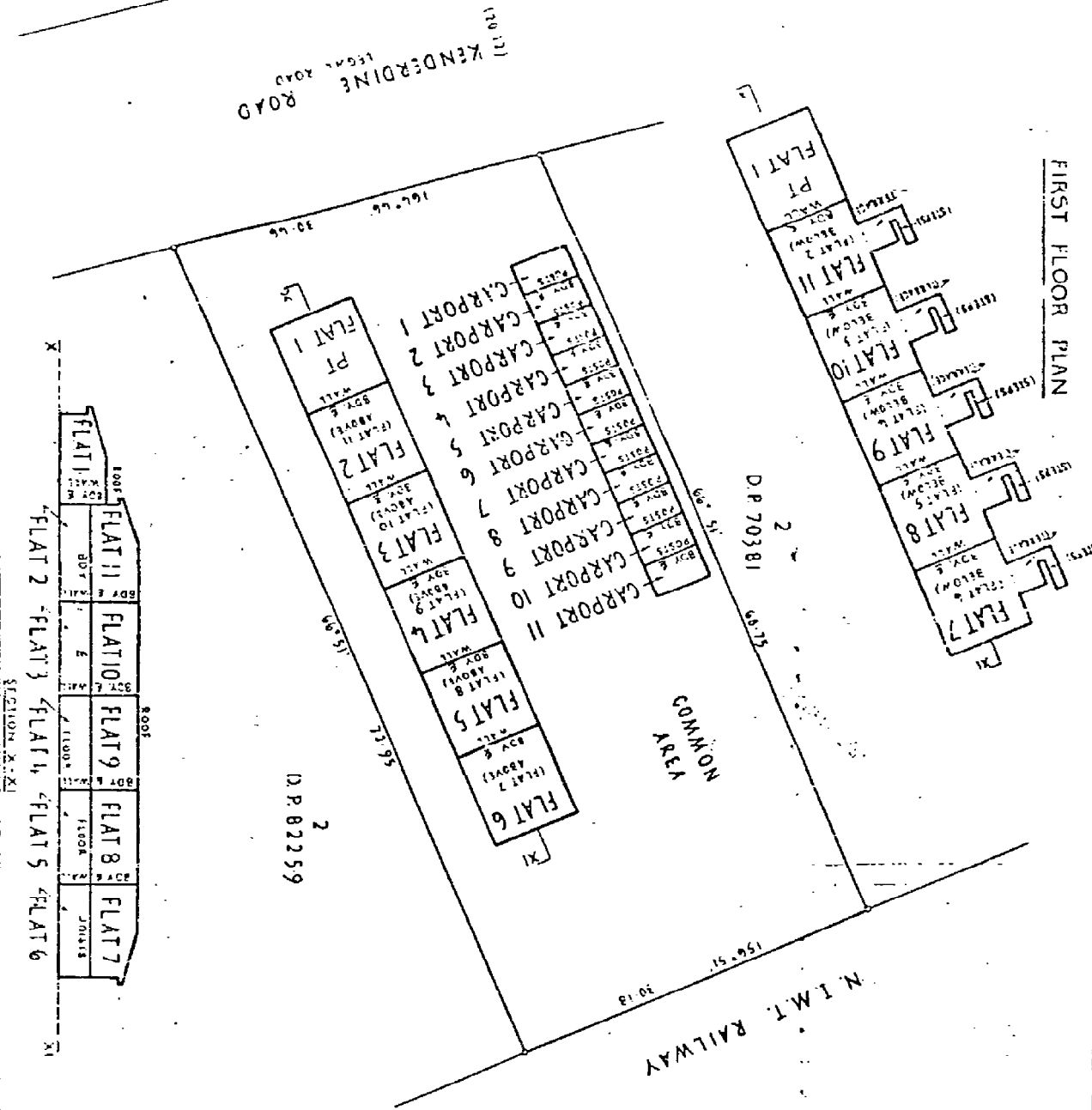
- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 and Carport 10 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - 9718884.10 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm

CERTIFICATE OF TITLE No.

1001 NORTH ADELPHAND
 7 OLLIBOND

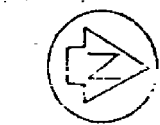
PLAN OF FLATS I-II ON LOT 34 D.P. 16605

LOCAL AUTHORITY PAPATOETOE CITY
 Surveyed by D.F. WICKAY & ASSOCIATES
 Date JANUARY 1985



D.P. 82259

D.P. 70381



DICTATED

APPROVED AS TO SUBSTANCE AND FORM

[Signature]

Approved as to substance and form by the Registrar-General on 10/1/85.

APPROVED AS TO SUBSTANCE AND FORM

[Signature]

Approved as to substance and form by the Registrar-General on 10/1/85.

D.P. 16605, 70181, 82259

D.P. 102208

THIS PLAN AND THE INFORMATION CONTAINED THEREIN ARE THE PROPERTY OF THE REGISTRAR GENERAL AND ARE LOANED TO YOU FOR YOUR INFORMATION ONLY. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE REGISTRAR GENERAL.

10/1 1985

NEW LOT ALLOCATED

FLAT 1	SEC/195
FLAT 2	SEC/195
FLAT 3	SEC/195
FLAT 4	SEC/195
FLAT 5	SEC/195
FLAT 6	SEC/195
FLAT 7	SEC/195
FLAT 8	SEC/195
FLAT 9	SEC/195
FLAT 10	SEC/195
FLAT 11	SEC/195
FLAT 12	SEC/195

Total Area 2137m²

Comprised in C.T. 404/1641411

TO WHOM IT MAY COME, I HEREBY CERTIFY THAT THE PLAN IS CORRECT AND THAT THE INFORMATION CONTAINED THEREIN IS TRUE AND ACCURATE.

DATED 31/1/85

[Signature]

THE REGISTRAR GENERAL

THE REGISTRAR GENERAL'S OFFICE
 1001 NORTH ADELPHAND
 WELLINGTON



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **NA56C/196**
Land Registration District **North Auckland**
Date Issued 09 August 1984

Prior References

NA404/164

Estate Fee Simple - 1/11 share
Area 2137 square metres more or less
Legal Description Lot 34 Deposited Plan 16605

Registered Owners
Dianne Victoria Williams

Estate	Leasehold	Instrument	L B317831.12
		Term	999 years commencing on 1.6.1984

Legal Description Flat 11 Deposited Plan 102388 and
Carport 11 Deposited Plan 102388

Registered Owners
Dianne Victoria Williams

Interests

- Fencing Agreement in Transfer 185037 (Affects Fee Simple)
- B317831.2 Lease of Flat 1 Composite CT NA56C/186 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.3 Lease of Flat 2 Composite CT NA56C/187 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.4 Lease of Flat 3 Composite CT NA56C/188 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.5 Lease of Flat 4 Composite CT NA56C/189 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.6 Lease of Flat 5 Composite CT NA56C/190 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.7 Lease of Flat 6 Composite CT NA56C/191 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.8 Lease of Flat 7 Composite CT NA56C/192 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.9 Lease of Flat 8 Composite CT NA56C/193 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.10 Lease of Flat 9 Composite CT NA56C/194 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.11 Lease of Flat 10 Composite CT NA56C/195 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - B317831.12 Lease of Flat 11 and Carport 11 DP 102388 Term 999 years commencing on 1.6.1984 Composite CT NA56C/196 issued - 9.8.1984 at 12.25 pm (Affects Fee Simple)
 - 9718884.12 Mortgage to Westpac New Zealand Limited - 6.5.2014 at 2:23 pm



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA46D/869**
Land Registration District **North Auckland**
Date Issued 26 September 1979

Prior References

NA38D/821

Estate Fee Simple - 1/3 share
Area 1175 square metres more or less
Legal Description Lot 2 Deposited Plan 82259

Registered Owners

Yin Hung Tan

Estate	Leasehold	Instrument	L 588255.1
		Term	999 years commencing on 1.9.1979

Legal Description Flat 1 Deposited Plan 89779 and Carport 1
Deposited Plan 89779

Registered Owners

Yin Hung Tan

Interests

588255.1 Lease of Flat 1 and Carport 1 DP 89779 Term 999 years commencing on 1.9.1979 Composite CT NA46D/869 issued - 26.9.1979 (Affects Fee Simple)

Land Covenant in Lease 588255.1 - 26.9.1979 (Affects Fee Simple)

588255.2 Lease of Flat 2 and Carport 2 Composite CT NA46D/870 issued - 26.9.1979 (Affects Fee Simple)

Land Covenant in Lease 588255.2 - 26.9.1979 (Affects Fee Simple)

588255.3 Lease of Flat 3 and Carport 3 Composite CT NA46D/871 issued - 26.9.1979 (Affects Fee Simple)

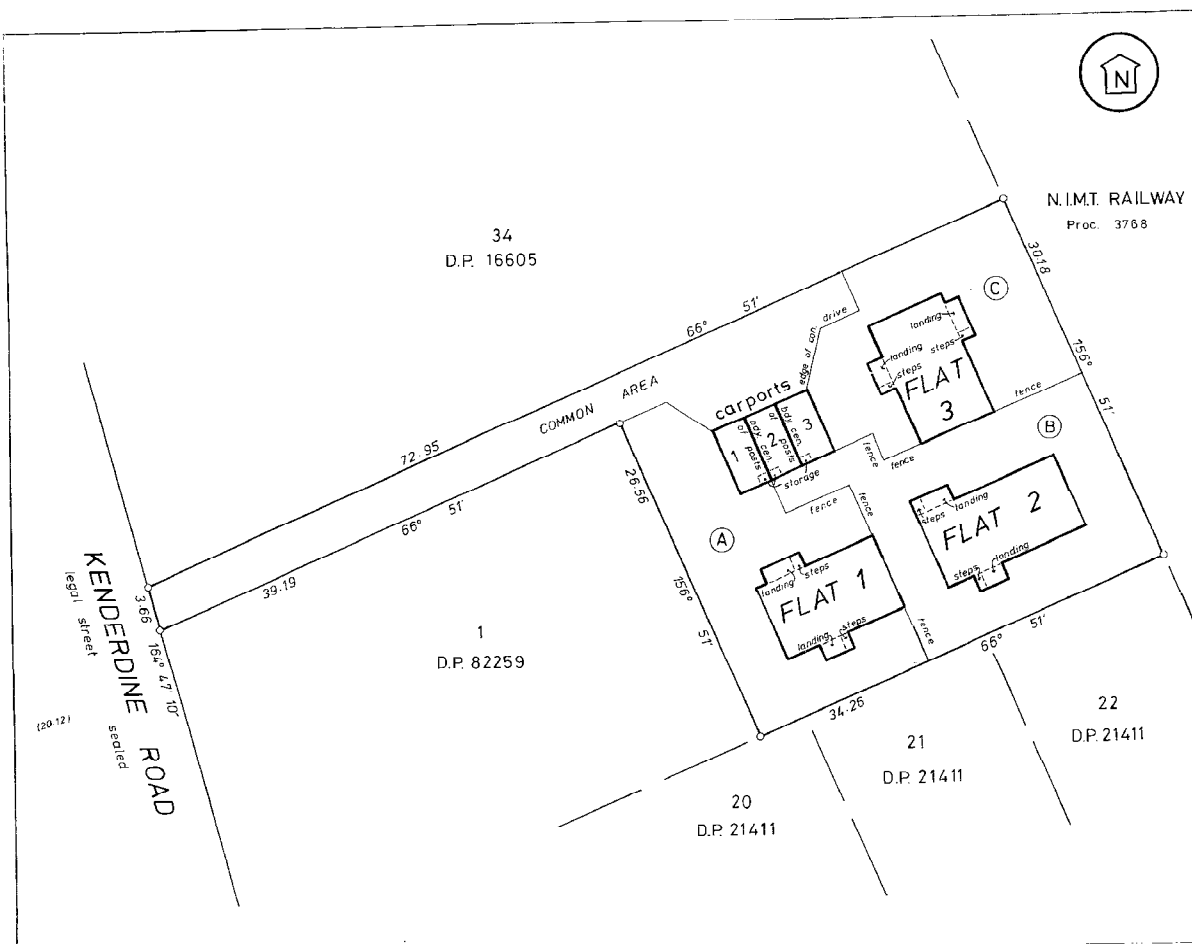
Land Covenant in Lease 588255.3 - 26.9.1979 (Affects Fee Simple)

C989173.2 Variation of Lease 588255.1 - 2.5.1996 at 11:55 am

C989173.3 Variation of Lease 588255.2 - 2.5.1996 at 11:55 am (Affects Fee Simple)

C989173.4 Variation of Lease 588255.3 - 2.5.1996 at 11:55 am (Affects Fee Simple)

10938499.3 Mortgage to ANZ Bank New Zealand Limited - 2.11.2017 at 2:08 pm



boundaries of areas to be leased are external faces of walls or structures unless shown otherwise

areas marked (A), (B) and (C) to be subject to restrictive covenants

I hereby certify that the provisions of part XX of the Local Government Act do not apply to the development shown hereon by virtue of section 270 (6) (b) of the Act

Dated at Auckland this 7th day of May 1979

John Yeoman
Town Clerk
Papatoetoe City

NEW C.S.T. ALLOCATED	
FLAT 1	460-869
FLAT 2	460-870
FLAT 3	460-871

Forsyth and Laurie Limited

registered owners

I, John Haslock Yeoman of Auckland registered surveyor and holder of an annual practising certificate hereby certify that the buildings shown hereon are erected in the position shown and are situated within the boundaries of C.T. 380-821 and that the plan is correct

Dated this 7th day of May 1979

John Yeoman

Total Area 1175m²
Comprised in C.T. 380-821

~~John Haslock Yeoman of Auckland Registered Surveyor and holder of an annual practising certificate hereby certify that this plan has been made from surveys executed by me or under my direction that the plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1968~~

Dated at Auckland this 29th day of May 1979

Field Book # Traverse Book #

Reference Plans

See notes *Adams* correct *Molton*

Approved as to Survey for the purpose of LEASING ONLY

43 8 73 *John Yeoman* (Chief Surveyor)

Deposited this 7th day of May 1979 for the purpose of LEASING ONLY

John Yeoman District Land Registrar

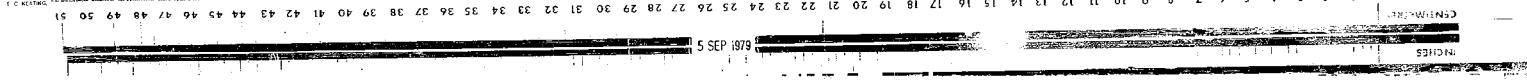
File 1501 Received 15/5/79

D.P. 89779

LAND DISTRICT North Auckland
SURVEY BLK. & DIST. X Otahuhu
NZMS SHEET No.

PLAN OF ON FLATS ON LOT 2
D.P. 82259

LOCAL AUTHORITY Papatoetoe City
Surveyed by John Yeoman
Scale 1:200 Date May 1979





STREET SHOWN IS LEGAL.
 APPROVED:
K. Jones & J. Jones
 Registered Owners

PURSUANT TO A RESOLUTION OF THE PAPAETOETOE CITY COUNCIL PASSED ON THE 22 DAY OF MARCH 1977 APPROVING UNDER SEC 351 OF THE MUNICIPAL CORPORATIONS ACT 1954 THE SUBDIVISION SHOWN HEREON & CERTIFYING THAT THE REQUIREMENTS OF SEC 33 (4) TOWN AND COUNTRY PLANNING ACT 1953 HAVE BEEN COMPLIED WITH THE COMMON SEAL OF THE BODY CORPORATE CALLED THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF PAPAETOETOE WAS HERETO AFFIXED.

MAYOR *[Signature]*
 TOWN CLERK *[Signature]*

New C's.T. Allocated:
 Lot 1-38D/820, Lot 2-38D/821

Total Area 2264 m²
 Comprised in C.I. 439/163 (All)

I CHARLES WARREN GARLICK of PAPAETOE Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from Surveys executed by me or under my direction, that both plan and Survey are correct and have been made in accordance with the regulations under the Surveyors Act 1958.

Dated at PAPAETOETOE this 6 day of December 1976 Signature *[Signature]*

Field Book Traverse Book
 Reference Plans

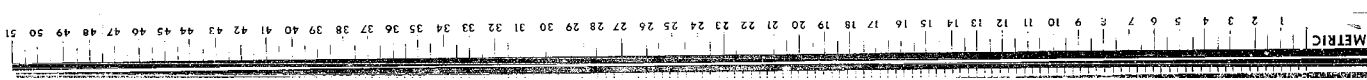
Examined *D. Kent* Correct
 Approved as to Survey *[Signature]*
 5/4/77 Assistant Chief Surveyor

Deposited this 3rd day of Nov 1977
[Signature] District Land Registrar
 File 90578
 Received Instructions DP 82259

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET NO.

PLAN OF LOTS 1 & 2 BEING A SUBDIVISION
 OF LOT 35 .D.P.16605

LOCAL AUTHORITY PAPAETOETOE CITY
 Surveyed by FRASER THOMAS GUNHAM SHAW AND PARTNERS
 Scale 1:250 Date NOV 1976





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA46D/870**
Land Registration District **North Auckland**
Date Issued 26 September 1979

Prior References
NA38D/821

Estate Fee Simple - 1/3 share
Area 1175 square metres more or less
Legal Description Lot 2 Deposited Plan 82259

Registered Owners
Kaashiv Investments Limited

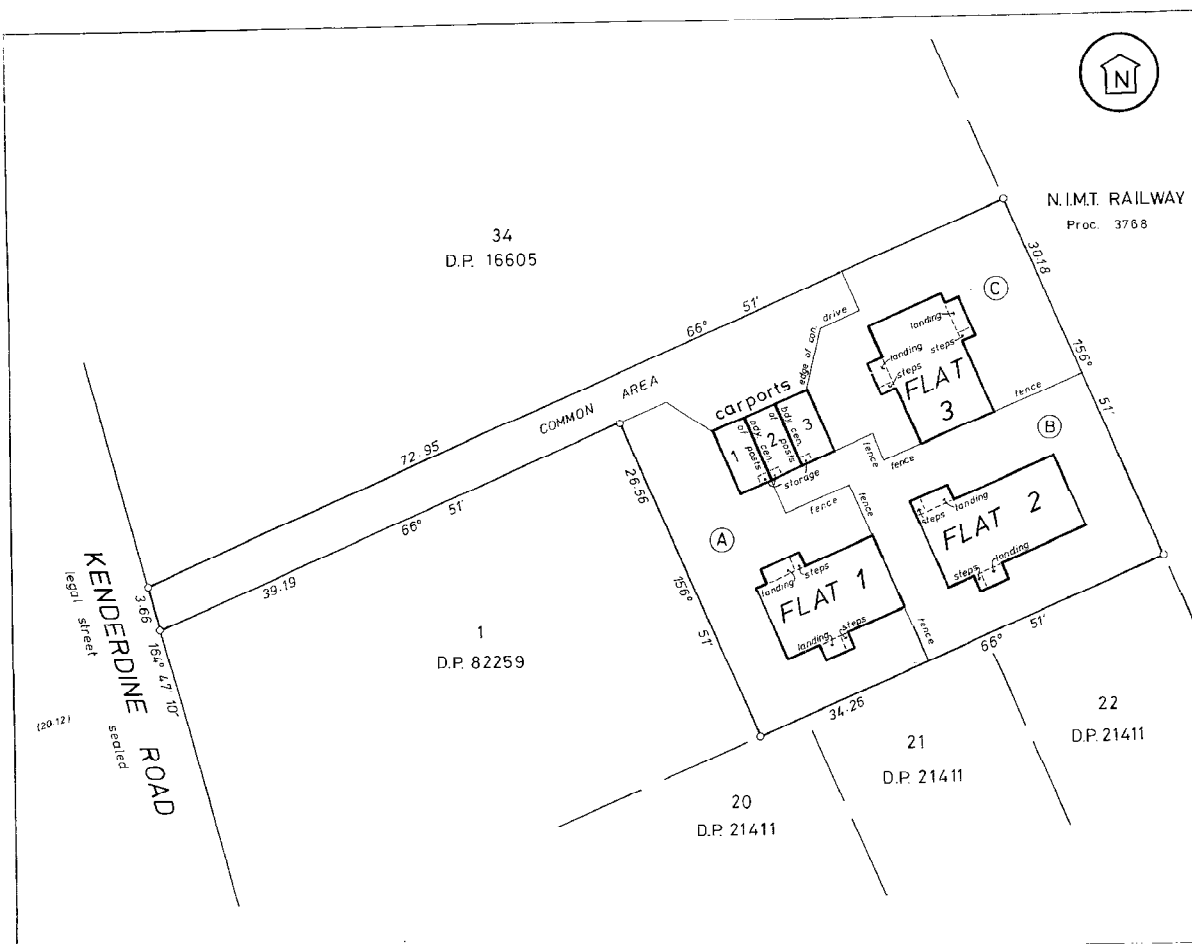
Estate	Leasehold	Instrument	L 588255.2
		Term	999 years commencing on 1.9.1979

Legal Description Flat 2 Deposited Plan 89779 and Carport 2
Deposited Plan 89779

Registered Owners
Kaashiv Investments Limited

Interests

- 588255.1 Lease of Flat 1 and Carport 1 Composite CT NA46D/869 issued - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.1 - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.2 - 26.9.1979 (Affects Fee Simple)
- 588255.2 Lease of Flat 2 and Carport 2 DP 89779 Term 999 years commencing on 1.9.1979 Composite CT NA46D/870 issued - 26.9.1979 (Affects Fee Simple)
- 588255.3 Lease of Flat 3 and Carport 3 Composite CT NA46D/871 issued - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.3 - 26.9.1979 (Affects Fee Simple)
- C989173.2 Variation of Lease 588255.1 - 2.5.1996 at 11.55 am (Affects Fee Simple)
- C989173.3 Variation of Lease 588255.2 - 2.5.1996 at 11.55 am
- C989173.4 Variation of Lease 588255.3 - 2.5.1996 at 11.55 am (Affects Fee Simple)
- Land Covenant in Deed 8865330.1 - 15.9.2011 at 10:09 am
- 11422428.3 Mortgage to ANZ Bank New Zealand Limited - 26.4.2019 at 5:34 pm



boundaries of areas to be leased are external faces of walls or structures unless shown otherwise

areas marked (A), (B) and (C) to be subject to restrictive covenants

I hereby certify that the provisions of part XX of the Local Government Act do not apply to the development shown hereon by virtue of section 270 (6) (b) of the Act

Dated at Auckland this 7th day of May 1979

John Yeoman
Town Clerk
Papatoetoe City

NEW C.S.T. ALLOCATED	
FLAT 1	460-869
FLAT 2	460-870
FLAT 3	460-871

Forsyth and Laurie Limited

registered owners

I, John Haslock Yeoman of Auckland registered surveyor and holder of an annual practising certificate hereby certify that the buildings shown hereon are erected in the position shown and are situated within the boundaries of C.T. 380-821 and that the plan is correct

Dated this 7th day of May 1979

John Yeoman

Total Area 1175m²
Comprised in C.T. 380-821

~~John Haslock Yeoman of Auckland Registered Surveyor and holder of an annual practising certificate hereby certify that this plan has been made from surveys executed by me or under my direction that the plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1968~~

Dated at Auckland this 29th day of May 1979

Field Book # Traverse Book #

Reference Plans

See notes *Adams correct* *Molton*

Approved as to Survey for the purpose of LEASING ONLY

43 8 73 *John Yeoman* Chief Surveyor

Deposited this 7th day of May 1979 for the purpose of LEASING ONLY

John Yeoman District Land Registrar

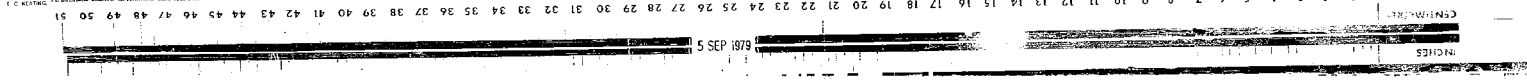
File 1501 Received 15/5/79

D.P. 89779

LAND DISTRICT North Auckland
SURVEY BLK. & DIST. X Otahuhu
NZMS SHEET No.

PLAN OF ON FLATS ON LOT 2
D.P. 82259

LOCAL AUTHORITY Papatoetoe City
Surveyed by John Yeoman
Scale 1:200 Date May 1979





STREET SHOWN IS LEGAL.
 APPROVED:
K. Jones & J. Jones
 Registered Owners

PURSUANT TO A RESOLUTION OF THE PAPAETOETOE CITY COUNCIL PASSED ON THE 22 DAY OF MARCH 1977 APPROVING UNDER SEC 351 OF THE MUNICIPAL CORPORATIONS ACT 1954 THE SUBDIVISION SHOWN HEREON & CERTIFYING THAT THE REQUIREMENTS OF SEC 33 (4) TOWN AND COUNTRY PLANNING ACT 1953 HAVE BEEN COMPLIED WITH THE COMMON SEAL OF THE BODY CORPORATE CALLED THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF PAPAETOETOE WAS HERETO AFFIXED.

MAYOR *[Signature]*
 TOWN CLERK *[Signature]*

New C's.T. Allocated:
 Lot 1-38D/820, Lot 2-38D/821

Total Area 2264m²
 Comprised in C.I. 439/163 (All)

I, CHARLES WARREN GARLICK of PAPAETOE, Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from Surveys executed by me or under my direction, that both plan and Survey are correct and have been made in accordance with the regulations under the Surveyors Act 1958.

Dated at PAPAETOETOE this 6 day of December 1976. Signature *[Signature]*

Field Book Traverse Book
 Reference Plans

Examined *D. Kent* Correct

Approved as to Survey *[Signature]*
 5/4/77 Assistant Chief Surveyor

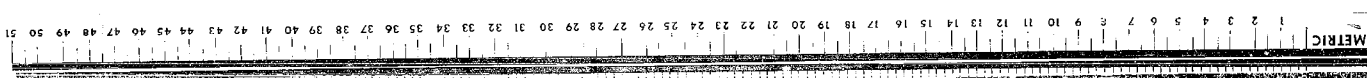
Deposited this 3rd day of Nov 1977

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET NO.

PLAN OF LOTS 1 & 2 BEING A SUBDIVISION
 OF LOT 35 .D.P.16605.

LOCAL AUTHORITY PAPAETOETOE CITY
 Surveyed by FRASER THOMAS GUNHAM SHAW AND PARTNERS
 Scale 1:250 Date NOV 1976

File 90578
 Received *[Signature]* Land Registrar
 DP 82259





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
CROSS LEASE
Search Copy**



R. W. Muir
Registrar-General
of Land

Identifier **NA46D/871**
Land Registration District **North Auckland**
Date Issued 26 September 1979

Prior References
NA38D/821

Estate Fee Simple - 1/3 share
Area 1175 square metres more or less
Legal Description Lot 2 Deposited Plan 82259

Registered Owners
Melena Investments Limited

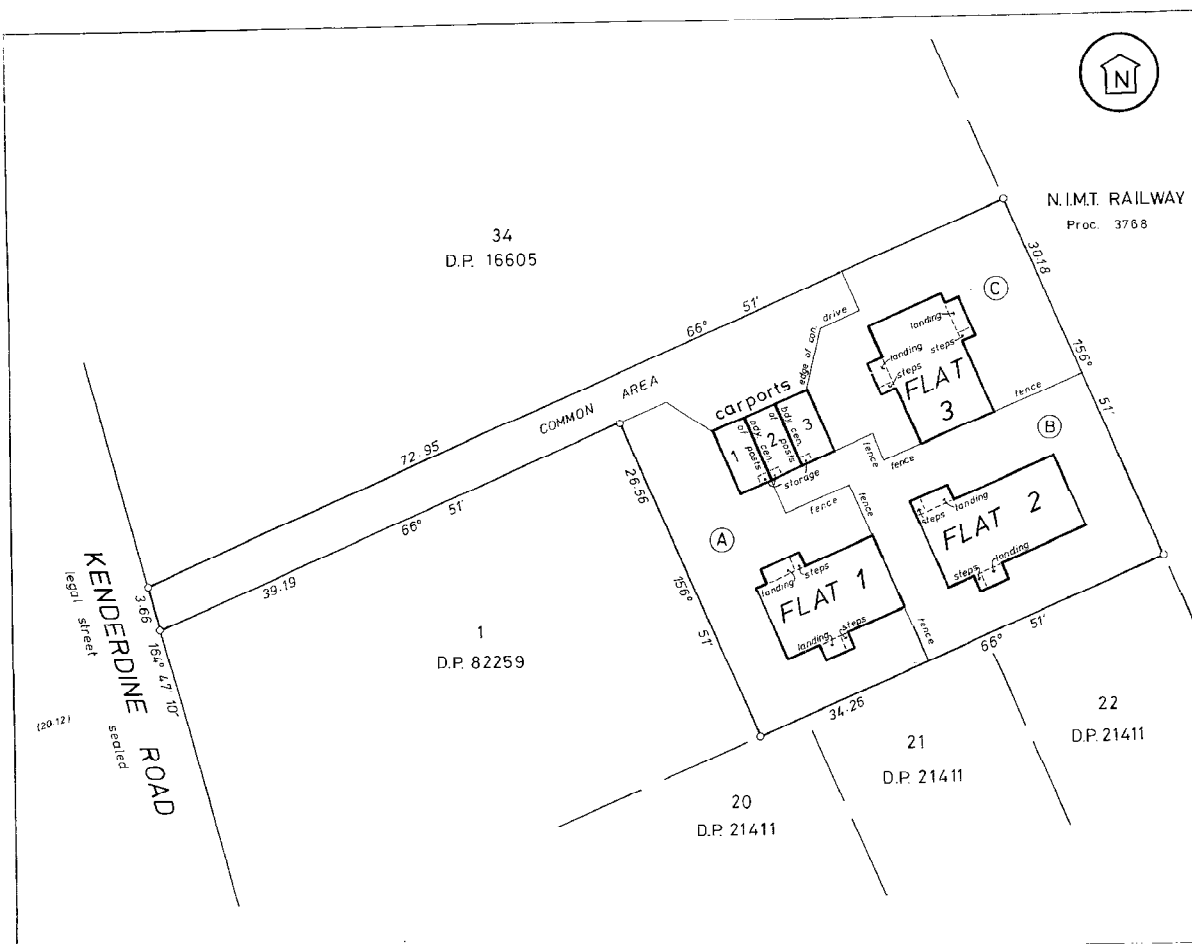
Estate	Leasehold	Instrument	L 588255.3
		Term	999 years commencing on 1.9.1979

Legal Description Flat 3 Deposited Plan 89779 and Carport 3
Deposited Plan 89779

Registered Owners
Melena Investments Limited

Interests

- 588255.1 Lease of Flat 1 and Carport 1 Composite CT NA46D/869 issued - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.1 - 26.9.1979 (Affects Fee Simple)
- 588255.2 Lease of Flat 2 and Carport 2 Composite CT NA46D/870 issued - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.2 - 26.9.1979 (Affects Fee Simple)
- Land Covenant in Lease 588255.3 - 26.9.1979 (Affects Fee Simple)
- 588255.3 Lease of Flat 3 and Carport 3 DP 89779 Term 999 years commencing on 1.9.1979 Composite CT NA46D/871 issued - 26.9.1979 (Affects Fee Simple)
- C989173.2 Variation of Lease 588255.1 - 2.5.1996 at 11.55 am (Affects Fee Simple)
- C989173.3 Variation of Lease 588255.2 - 2.5.1996 at 11.55 am (Affects Fee Simple)
- C989173.4 Variation of Lease 588255.3 - 2.5.1996 at 11.55 am
- 10626078.3 Mortgage to ANZ Bank New Zealand Limited - 17.11.2016 at 4:36 pm



boundaries of areas to be leased are external faces of walls or structures unless shown otherwise

areas marked (A), (B) and (C) to be subject to restrictive covenants

I hereby certify that the provisions of part XX of the Local Government Act do not apply to the development shown hereon by virtue of section 270 (6) (b) of the Act

Dated at Auckland this 7th day of May 1979

John Yeoman
Town Clerk
Papatoetoe City

NEW C.S.T. ALLOCATED	
FLAT 1	460-869
FLAT 2	460-870
FLAT 3	460-871

Forsyth and Laurie Limited

registered owners

I John Haslock Yeoman of Auckland registered surveyor and holder of an annual practising certificate hereby certify that the buildings shown hereon are erected in the position shown and are situated within the boundaries of C.T. 380-821 and that the plan is correct

Dated this 7th day of May 1979

John Yeoman

Total Area 1175m²
Comprised in C.T. 380-821

~~John Haslock Yeoman of Auckland Registered Surveyor and holder of an annual practising certificate hereby certify that this plan has been made from surveys executed by me or under my direction that the plan and survey are correct and have been made in accordance with the regulations under the Surveyors Act 1968~~

Dated at Auckland this 29th day of May 1979

Field Book # Traverse Book #

Reference Plans

See notes *Adams correct* *Molton*

Approved as to Survey for the purpose of LEASING ONLY

43 8 73 *Richard* Chief Surveyor

Deposited this 7th day of May 1979 for the purpose of LEASING ONLY

John Yeoman District Land Registrar

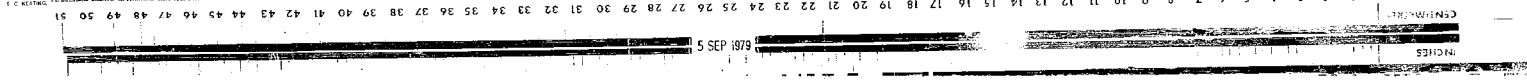
Fee 150/- Received

D.P. 89779

LAND DISTRICT North Auckland
SURVEY BLK. & DIST. X Otahuhu
NZMS SHEET No.

PLAN OF ON FLATS ON LOT 2
D.P. 82259

LOCAL AUTHORITY Papatoetoe City
Surveyed by John Yeoman
Scale 1:200 Date May 1979





STREET SHOWN IS LEGAL.
 APPROVED:
K. Jones & Partners
 Registered Owners

PURSUANT TO A RESOLUTION OF THE PAPAETOETOE CITY COUNCIL PASSED ON THE 22 DAY OF MARCH 1976 APPROVING UNDER SEC 351 OF THE MUNICIPAL CORPORATIONS ACT 1954 THE SUBDIVISION SHOWN HEREON & CERTIFYING THAT THE REQUIREMENTS OF SEC 33 (4) TOWN AND COUNTRY PLANNING ACT 1953 HAVE BEEN COMPLIED WITH THE COMMON SEAL OF THE BODY CORPORATE CALLED THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF PAPAETOETOE WAS HERETO AFFIXED.

MAYOR *[Signature]*
 TOWN CLERK *[Signature]*

New C's.T. Allocated:
 Lot 1-38D/820, Lot 2-38D/821

Total Area 2264 m²
 Comprised in C.I. 439/163 (All)

I CHARLES WARREN GARLICK of PAPAETOE Registered Surveyor and holder of an annual practicing certificate hereby certify that this plan has been made from Surveys executed by me or under my direction, that both plan and Survey are correct and have been made in accordance with the regulations under the Surveyors Act 1958.

Dated at PAPAETOETOE this 6 day of December 1976 Signature *[Signature]*

Field Book Traverse Book

Reference Plans

Examined *D. Kent* Correct

Approved as to Survey *[Signature]*
 5/4/77 Assistant Chief Surveyor

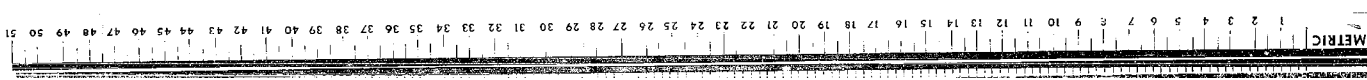
Deposited this 3rd day of Nov 1976
[Signature] District Land Registrar

LAND DISTRICT NORTH AUCKLAND
 SURVEY BLK. & DIST. X OTAHUHU
 NZMS SHEET NO.

PLAN OF LOTS 1 & 2 BEING A SUBDIVISION
 OF LOT 35 .D.P.16605.

LOCAL AUTHORITY PAPAETOETOE CITY
 Surveyed by FRASER THOMAS GUNHAM SHAW AND PARTNERS
 Scale 1:250 Date NOV 1976

File 90578
 Received Instructions
 DP 82259





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA1024/215
Land Registration District North Auckland
Date Issued 11 February 1952

Prior References

NA898/96

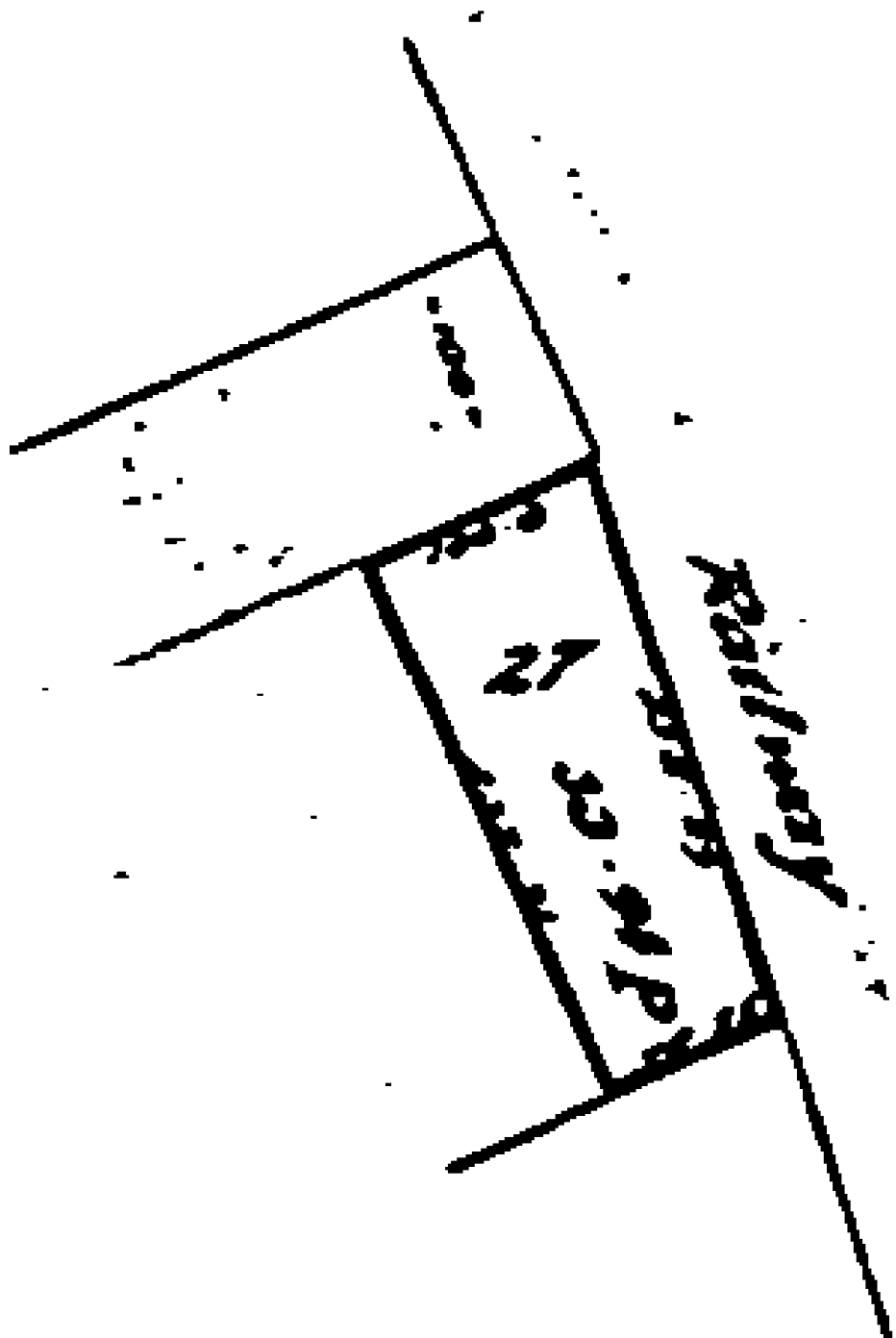
Estate Fee Simple
Area 858 square metres more or less
Legal Description Lot 27 Deposited Plan 21411

Registered Owners

Bhan Pratap and Sujata Sanjogita Barma

Interests

9459738.3 Mortgage to ANZ Bank New Zealand Limited - 18.7.2013 at 3:10 pm





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA1014/50
Land Registration District North Auckland
Date Issued 19 October 1951

Prior References

NA898/96

Estate Fee Simple
Area 841 square metres more or less
Legal Description Lot 22 Deposited Plan 21411

Registered Owners

Christine Beverley Hau

Interests

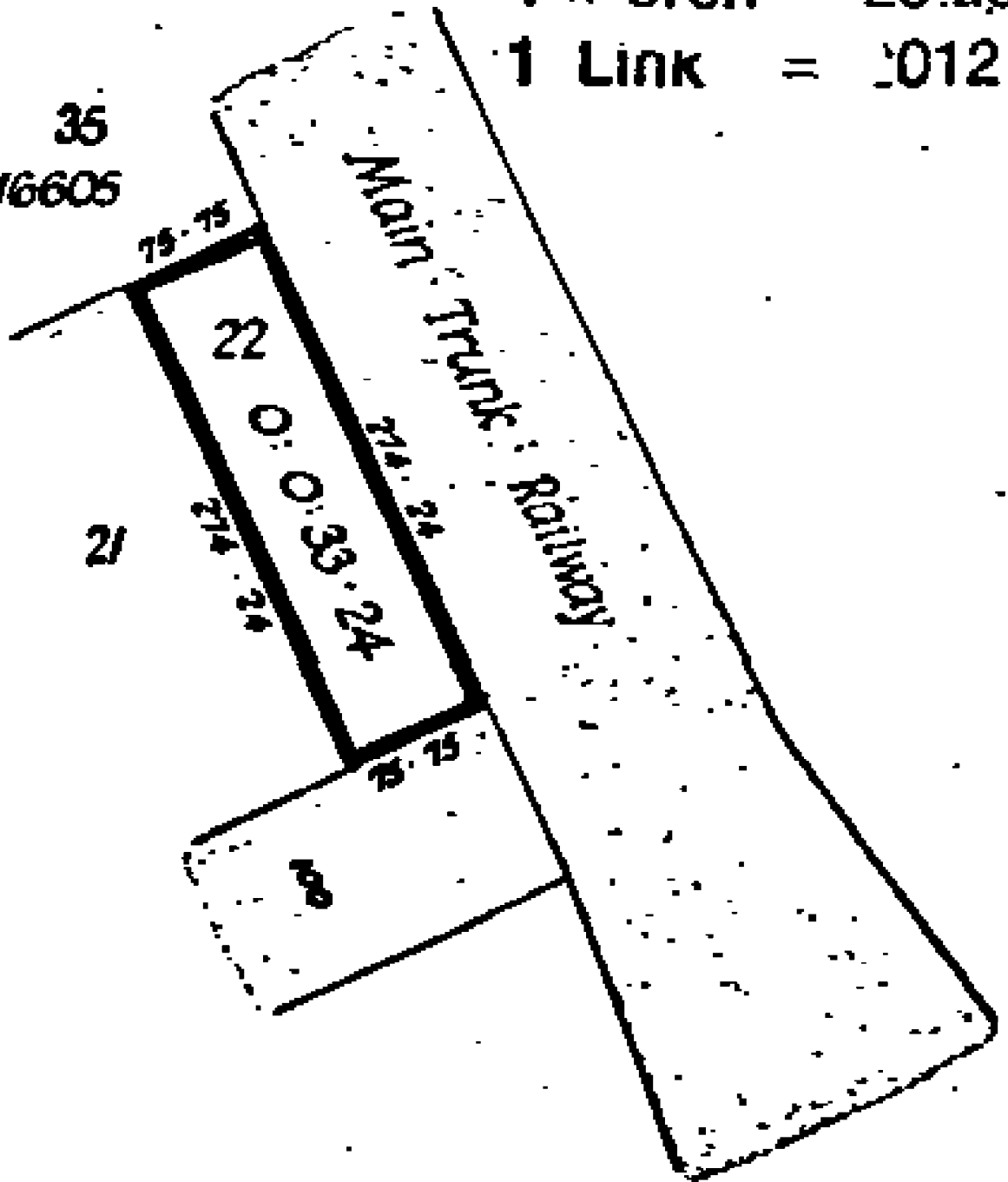
Fencing Agreement in Transfer 499964 - 19.10.1951
C338561.1 Statutory Land Charge pursuant to Section 18 (4) Legal Aid Act 1969 - 14.1.1992 at 2.40 pm
D158322.4 Mortgage to ASB Bank Limited - 20.6.1997 at 11.03 am
Land Covenant in Deed 8422846.1 - 22.2.2010 at 9:00 am

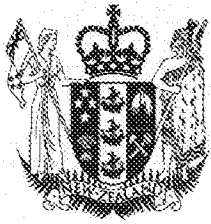
1 Perch = 25.2928 m

1 Link = 0.0125 m



35
D.P. 16605





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **288891**
Land Registration District **North Auckland**
Date Issued 10 July 2006

Prior References

NA80A/946

Estate Fee Simple
Area 1.6008 hectares more or less
Legal Description Lot 2 Deposited Plan 371368

Registered Owners

Waikato Crane Services Limited

Interests

Subject to a drainage right over part created by Deed 97006 (R20/407) and modified by K29038 (affects formerly part CsT NA1098/225 and NA1604/33)

Subject to Part IV A Conservation Act 1987

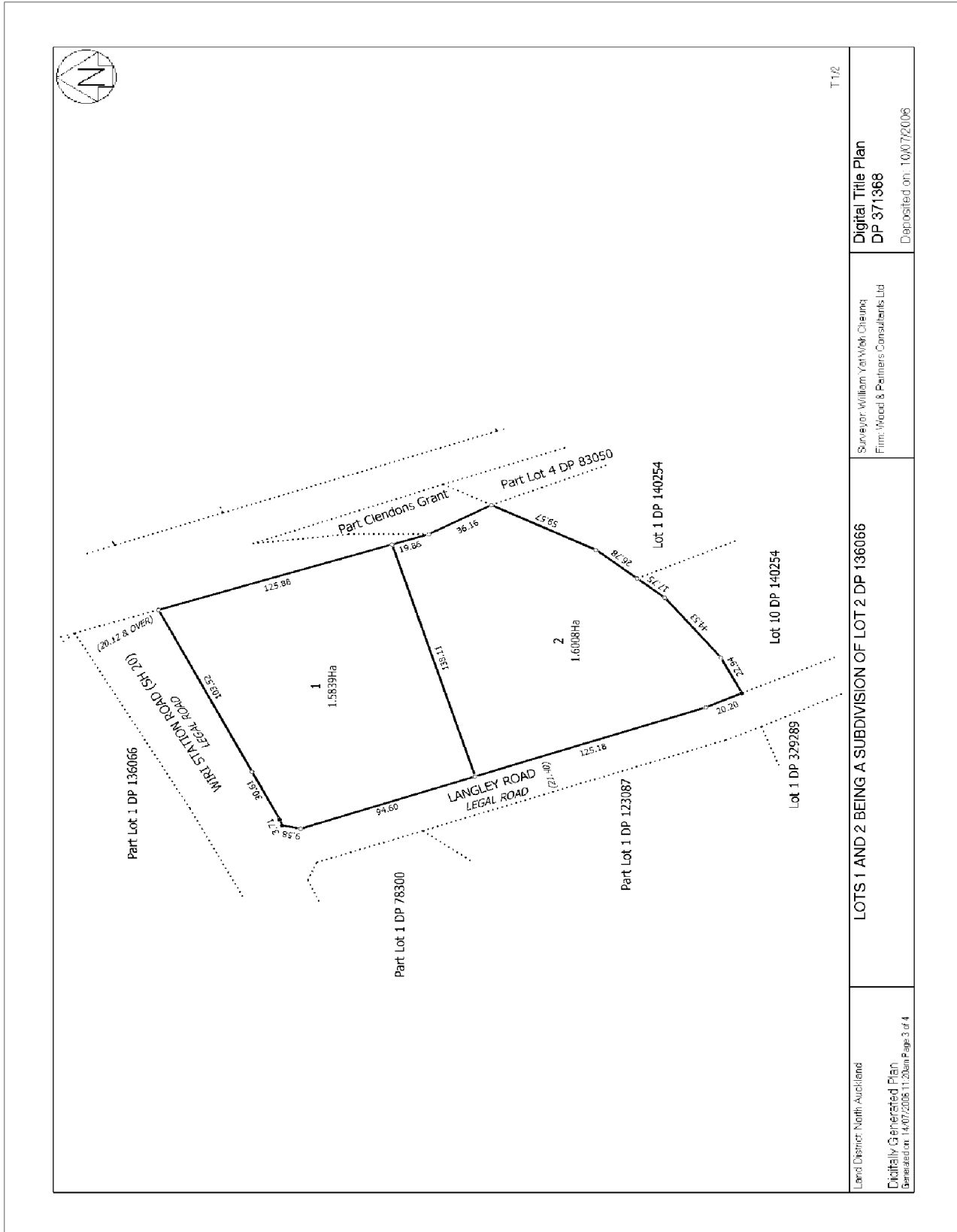
Subject to Section 11 Crown Minerals Act 1991

Appurtenant hereto are rights of way created by Deed 64203 (28M/513) (affects part formerly in CsT NA1098/225 and NA1604/33)

Subject to a right (in gross) to lay and operate railway lines and a right of way over part marked A on DP 371368 in favour of The New Zealand Railways Corporation created by Transfer D214814.1 - 12.11.1997 at 1.08 pm

6941121.1 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 10.7.2006 at 9:00 am

10974776.5 Mortgage to Bank of New Zealand - 13.12.2017 at 10:11 am



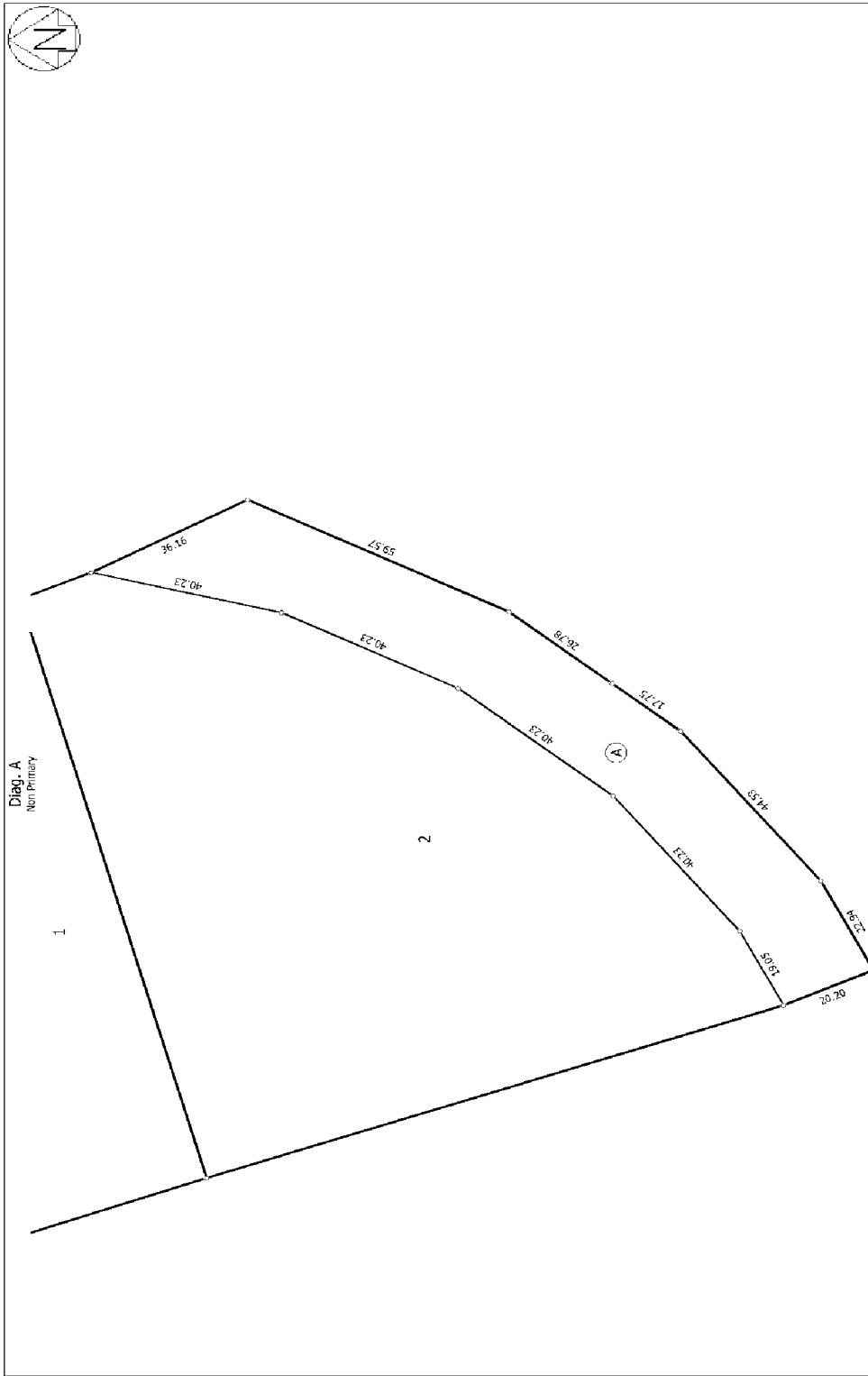
T112

Digital Title Plan
DP 371368
Deposited on: 10/07/2006

Surveyor: William Yat Wek Cheung
Firm: Wood & Partners Consultants Ltd

LOTS 1 AND 2 BEING A SUBDIVISION OF LOT 2 DP 136066

Land District: North Auckland
Digitally Generated Plan
Generated on: 14/07/2006 11:20am Page 3 of 4



T 242

Digital Title Plan
DP 371368

Surveyor: William Yat Wek Cheung
Firm: Wood & Partners Consultants Ltd

LOTS 1 AND 2 BEING A SUBDIVISION OF LOT 2 DP 136066

Land District: North Auckland
Digitally Generated Plan
Generated on: 14/07/2016 11:20am Page 4 of 4

Deposited on: 10/07/2006



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **834408**
Land Registration District **North Auckland**
Date Issued 06 April 2018

Prior References

NA115C/555

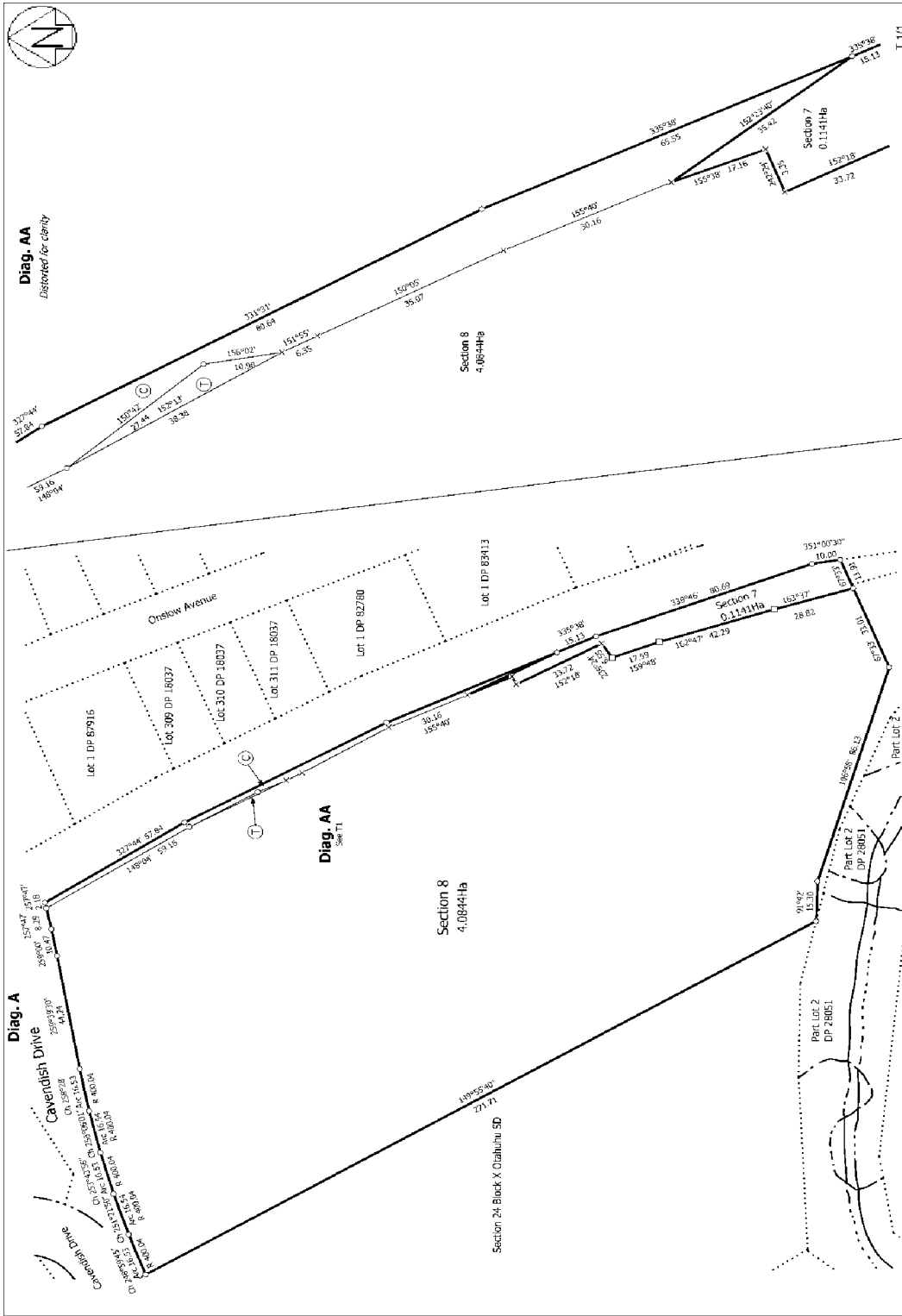
Estate Fee Simple
Area 4.0844 hectares more or less
Legal Description Section 8 Survey Office Plan 501086

Registered Owners

P.F.I. Property No. 1 Limited

Interests

D246243.3 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 - 19.2.1998 at 2:39 pm
Subject to a railway easement (in gross) over part marked C and T on SO 501086 in favour of Her Majesty the Queen created by Easement Instrument 10817033.6 - 6.4.2018 at 2:51 pm
11143327.3 Mortgage to New Zealand Permanent Trustees Limited - 22.6.2018 at 3:29 pm
11508299.1 CAVEAT BY VECTOR LIMITED - 6.8.2019 at 11:20 am



Land District: North Auckland
 Digitally Generated Plan
 Generated on: 12/02/2018 1:37pm Page: 3 of 3

Sections 7 and 8

Surveyor: Michael David Tagg
 Firm: Survey Works Ltd

Title Plan
 SO 501086
 Approved on: 12/02/2018



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA80B/675**
Land Registration District **North Auckland**
Date Issued 14 December 1990

Prior References

NA17C/297

Estate Fee Simple
Area 3223 square metres more or less
Legal Description Lot 1 Deposited Plan 62022 and Part Lot 1
Deposited Plan 136372

Registered Owners

The Presbyterian Church Property Trustees

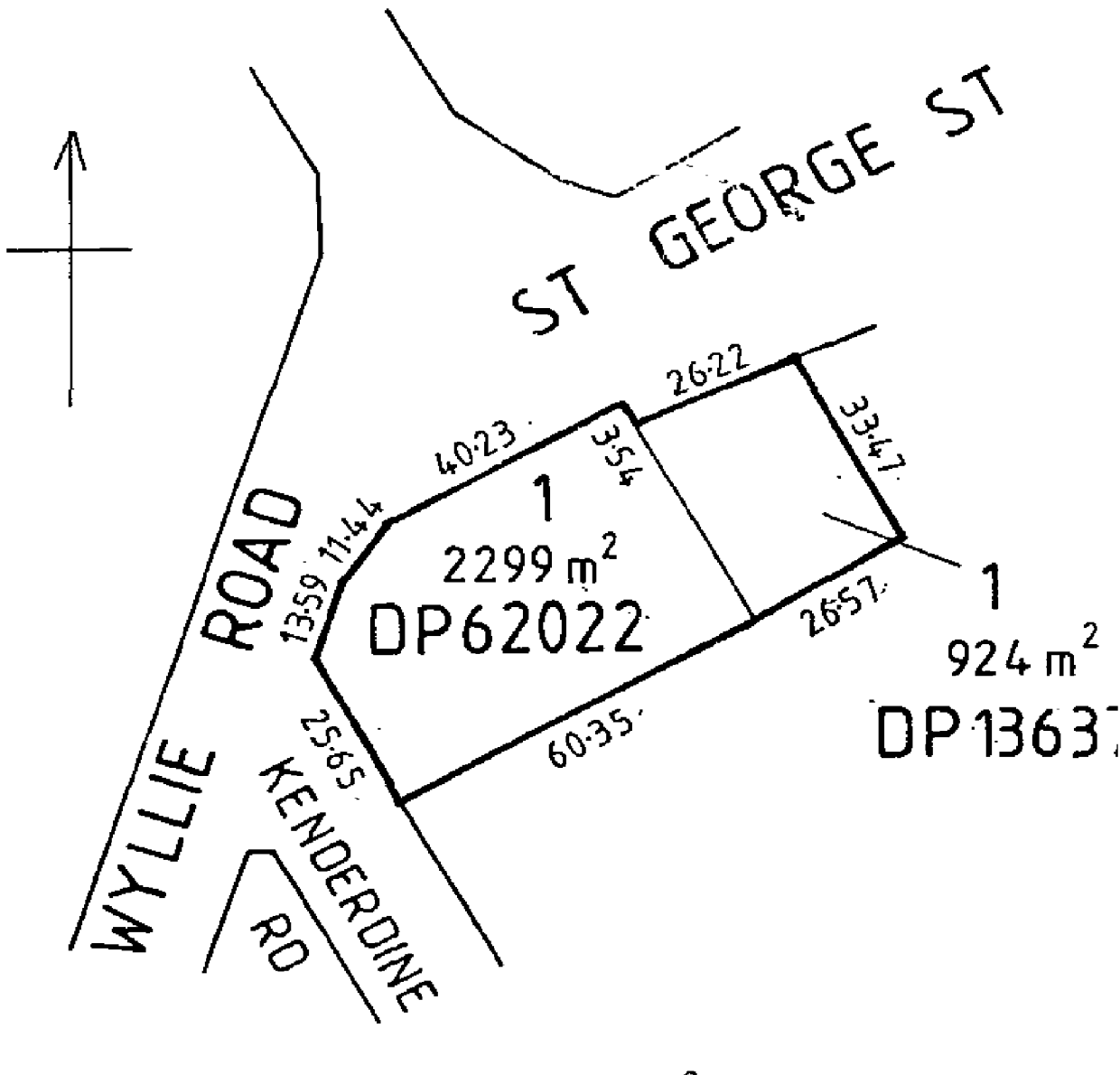
Interests

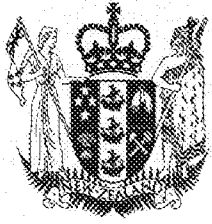
Fencing Agreement in Transfer 179552 (affects part formerly in CT NA17C/297)

Subject to Section 308 (4) Local Government Act 1974

Subject to a right of way over part marked A on DP 152288 created by Transfer C474454.3 - 27.4.1993 at 2.39 pm

PAPATOETOE CITY





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier NA482/16
Land Registration District North Auckland
Date Issued 05 October 1928

Prior References

NA453/299

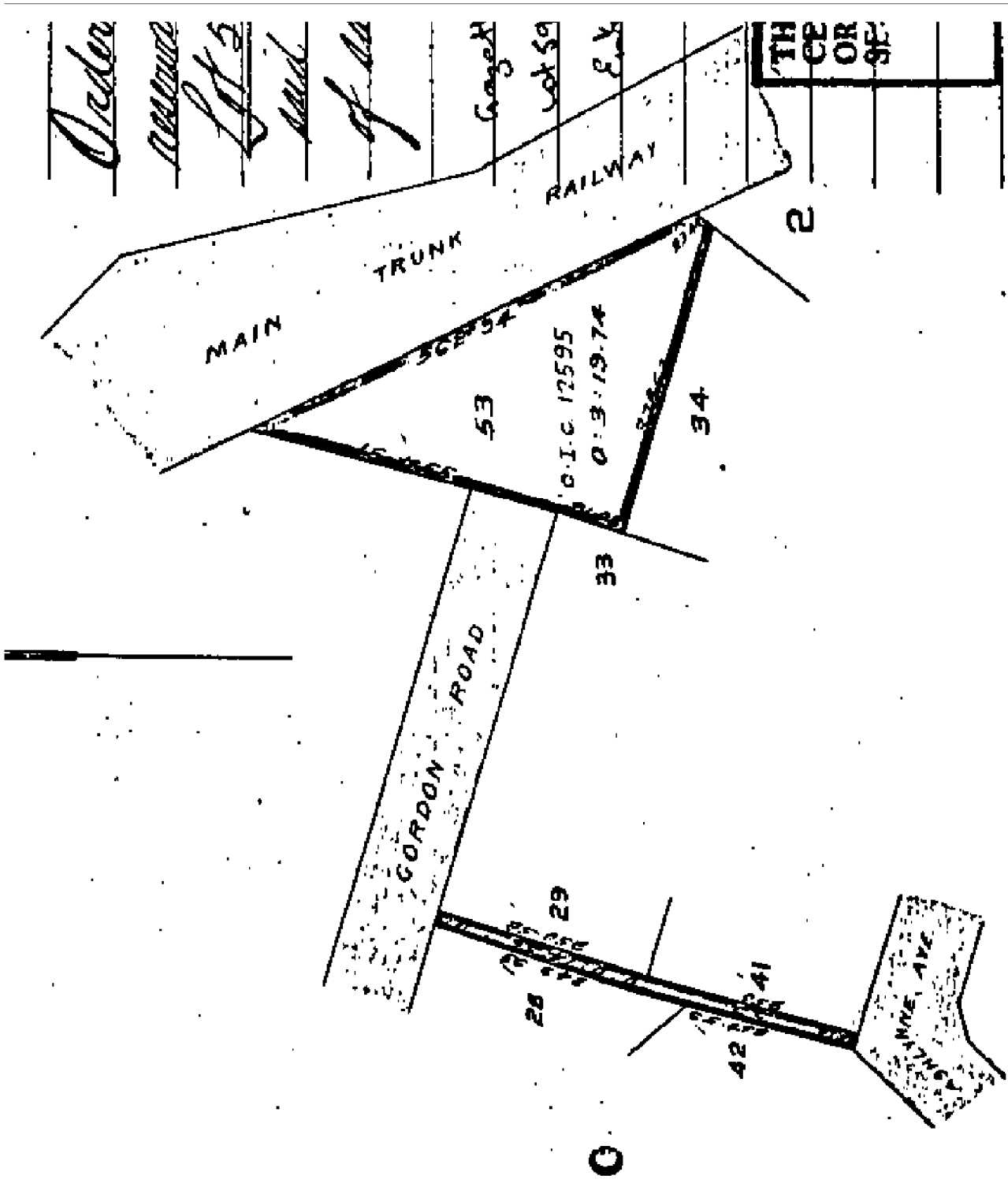
Estate	Fee Simple
Area	3903 square metres more or less
Legal Description	Lot 53 and Lot 59 Deposited Plan 20068
Purpose	Reserve for access way

Registered Owners

Auckland Council

Interests

The Reserve for Access Way affects Lot 59 DP 20068 only
Fencing Agreement in Transfer 225613 - 5.10.1928





**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy**




R. W. Muir
Registrar-General
of Land

Identifier **NA1014/55**
Land Registration District **North Auckland**
Date Issued 19 October 1951

Prior References

NA898/96

Estate Fee Simple
Area 841 square metres more or less
Legal Description Lot 21 Deposited Plan 21411

Registered Owners

Kilisitofa Asesika Kaihau and Lovely Nola Fifita Kaihau

Interests

9133789.2 Mortgage to Bank of New Zealand - 26.7.2012 at 5:12 pm

840m
METRIC AREA IS

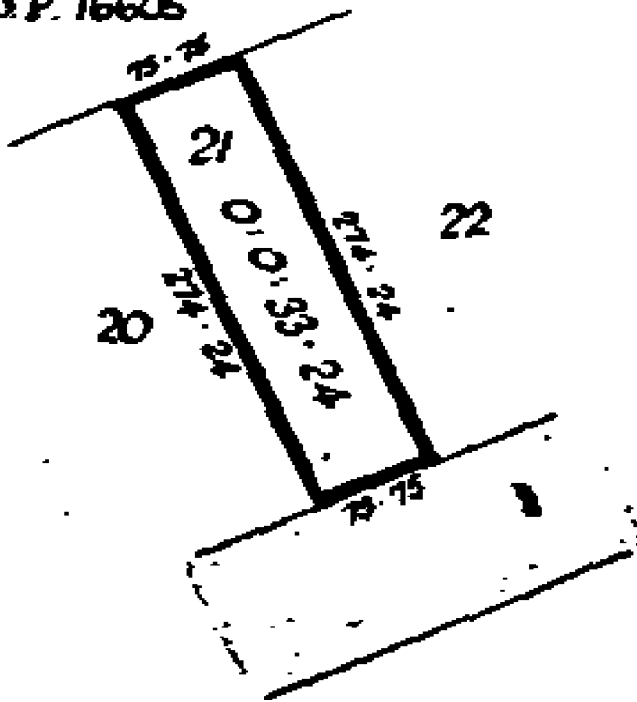
3 (1) 1/2
Conversion Factors:

1 Acre = 4046.86m²

1 Fatha = 2610.0m²

1 Link = 1012 metres

35
D.P. 16605



View Statutory Action

Parcel Lot 2 Deposited Plan 31269
Current Purpose Recreation Reserve

Parcel ID 4775663
Parcel Status Current

Statutory Action	Type	Recorded	Action	Status
New Zealand Gazette 1967 p 2287	Gazette Notice	04/04/2002	Create	Current

Statute
Purpose Recreation Reserve

Name
Comments

*** End of Report ***



Wiri to Quay Park Project

Preliminary Site Investigation

IA233800-A.CS.EV.P1ENV-NW-RPT-0001 | 01

5 June 2020

KiwiRail Holdings Limited

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
A	29/05/2020	Draft for internal review	GH	KT	KT	-
01	5 June 2020	Draft for Client Review	GH	KT	TH	TH

Wiri to Quay Park Project

Project No: IA233800
Document Title: Preliminary Site Investigation
Document No.: IA233800-A.CS.EV.P1ENV-NW-RPT-0001
Revision: 01
Date: 5 June 2020
Client Name: KiwiRail
Project Manager: Melissa Merlo
Author: George Hampton
File Name:

Jacobs New Zealand Limited

Level 8, 1 Grey Street,
PO Box 10-283
Wellington, 6143
New Zealand
T +64 4 473 4265
F +64 4 473 3369
www.jacobs.com

© Copyright 2019 Jacobs New Zealand Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Contents

Executive Summary 1

1. Introduction 3

1.1 Terms of Reference..... 3

1.2 Objective..... 3

1.3 Scope of Work 3

1.4 Report Status..... 3

2. Environmental Setting..... 4

2.1 Site Location & Description..... 4

2.2 Zoning Description 8

2.3 Geology and Hydrogeology..... 8

3. Review of Available Information 9

3.1 Site Walkover 9

3.2 Review of Historical Aerial Imagery 9

3.3 Auckland Council Site Records..... 11

3.4 New Zealand Geotechnical Database Borehole Logs..... 12

3.5 Discussion 12

3.5.1 HAIL Assessment..... 13

4. Conclusions & Recommendations 14

4.1 Conclusions 14

4.2 Recommendations 14

- Appendix A. Site Information
- Appendix B. Historical Aerial Imagery
- Appendix C. AC Contamination Enquiry Response
- Appendix D. NZGD Records
- Appendix E. Hazardous Activities and Industries List (HAIL)

Executive Summary

This report documents the findings of a high-level Preliminary Site Investigation (PSI) to support a Notice of Requirement (NOR) for Package 1 (Wiri to Westfield Junction) of the Wiri to Quay Park (W2QP) Auckland rail improvement project. It presents preliminary information on the contamination status of 25 sites outside the existing rail corridor that may be subject to soil disturbance activities associated with the rail improvement works under Package 1, based mainly on the review of aerial photographs to assess land use, augmented by contaminated site enquiry information from Auckland Council (AC) and review of the New Zealand Geotechnical Database (NZGD). This information will be updated and used to support resource consent applications as they apply to the disturbance of contaminated land and sites listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL). HAIL sites are subject to controls under the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 (NESCS).

The properties comprise mainly residential properties in addition to informal reserve or undeveloped land and soft landscaped verges at Middlemore Hospital, on or close to the western side of the North Island Main Trunk (NIMT) rail corridor, over a distance of approx. 3.6 km. These include small strips of land immediately adjacent to the rail corridor, land for access routes for works vehicle and whole properties where more significant works are proposed.

The assessment indicates that the properties were generally in agricultural land use prior to about 1940, primarily grazing land, with increasing urbanisation over time. Localised horticultural land use is also possible, as evidenced by the presence of probable commercial scale greenhouses extending onto 74D Kenderdine Road.

It is interpreted that all of the residential properties, except 74D Kenderdine Road, are not likely to be HAIL. Horticultural activities identified at 74 Kenderdine Road are classified as HAIL A 10 – *Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds*.

In addition, no recreational areas/undeveloped land, landfills or the extensive use of level raising fill has been identified (HAIL G3. *Landfill sites*). In addition, although some pesticide/herbicide use is likely, use of persistent pesticide products as defined by HAIL A10. - *Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds*, is considered to be unlikely.

Hospitals are not listed as HAIL. However, some activities undertaken as part of hospital operations are HAIL and potentially include A3. - *Commercial analytical laboratory sites*, A17. - *Storage tanks or drums for fuel, chemicals or liquid waste* and B2. - *Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment*. The land parcels potentially subject to soil disturbance close to Middlemore Hospital do not appear to be associated with these HAIL activities.

It is noted that given age of the many of the dwellings, lead from lead-based paint and asbestos from degradation of building materials could be present in soil above background levels, close to the buildings. The potential for the presence of fill associated with rail corridor activities is also noted.

It is recommended that this assessment is updated following confirmation of the properties subject to soil disturbance and soil disturbance activities to be undertaken. This update should include site walk over inspection.

Important note about your report

The sole purpose of this report prepared by Jacobs New Zealand Limited (Jacobs) is to document the findings of a preliminary site investigation in relation to the contamination potential along the Wiri to Quay Park railway alignment in Auckland. The contents of the report are in accordance with the scope of services detailed in the terms of engagement between Jacobs and KiwiRail Holdings Limited (the Client).

In assessing available information and preparing this report, Jacobs has relied upon and presumed accurate, all information provided by the Client and any third party. Unless otherwise stated in this report, Jacobs has not attempted to verify the accuracy or completeness of any such information and Jacobs accepts no liability to the client and/or any third party for any loss and/or damage incurred as a result of any inaccurate or incomplete information.

The information in this report is derived from data provided by the client, and a number of public domains, including Auckland Council and Retrolens.

It is imperative to note that the Report only considers the site conditions current at the time of investigation, and to be aware that conditions may have changed due to natural forces and/or operations on or near the site. Any decisions based on the findings of the Report must take into account any subsequent changes in site conditions and/or developments in legislative and regulatory requirements. Jacobs accepts no liability to the Client or any third party for any loss and/or damage incurred as a result of a change in the site conditions and/or regulatory/legislative framework since the date of the Report.

Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law. Opinions and judgements expressed in the report are based on Jacobs' understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

This report does not have sufficient information to be used for any other purpose than the project specific requirements for which the report was carried out as detailed in the agreement. This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, the Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Terms of Reference

This report has been prepared for KiwiRail Holdings Limited (KiwiRail) by Jacobs New Zealand Limited (Jacobs). It presents the findings of a Preliminary Site Investigation (PSI) to support a Notice of Requirement (NOR) for the amendment to the designation associated with Package 1 (Wiri to Westfield Junction) of the Wiri to Quay Park (W2QP) Auckland rail improvement project.

1.2 Objective

The objective of the PSI is to provide preliminary information on the contamination status of properties outside the existing rail corridor that may be subject to soil disturbance activities associated with the works under Package 1 and to support the NOR for the amendment to the designation. This information will also later be updated and used to support resource consent applications as they apply to the disturbance of contaminated land and sites listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL), which are subject to controls under the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 (NESCS).

1.3 Scope of Work

This PSI is based mainly on the review of aerial photographs to assess land use activities of 25 properties adjacent to the rail corridor identified by Kiwi Rail as potentially affected by the Package 1 rail improvement works. The aerial photographs have been obtained from publicly available sources, chiefly Auckland Council (AC) GeoMaps and Retrolens Historical Image Resource. Further information was obtained on selected sites from AC records via a contaminated site enquiry to AC and from review of available borehole records from the New Zealand Geotechnical Database (NZGD).

1.4 Report Status

This report has been prepared by Kevin Tearney, CEnvP SC, a Suitably Qualified and Experienced Practitioner (SQEP) as described under the NESCS, in general accordance with MfE Contaminated Land management Guideline (CLMG) No 1 Reporting on Contaminated Sites in New Zealand.

2. Environmental Setting

2.1 Site Location & Description

The PSI covers properties located adjacent to the rail corridor between Rosella Road, Mangere East in the north and Bridge Street, Papatoetoe to the south, over a distance of approx. 3.6 km, as shown on Figure 2.1. The properties are listed and described in Table 2.1, broken down for ease of discussion into four parts (Part One, Part Two, Part Three, and Part Four). They largely comprise residential properties, in addition to some reserve land, on or close to the western side of the railway corridor. Information on the areas of land within each property potentially affected by the improvements is also presented, including land required for construction access, rail infrastructure and retaining walls.. Further information is provided in Appendix A.

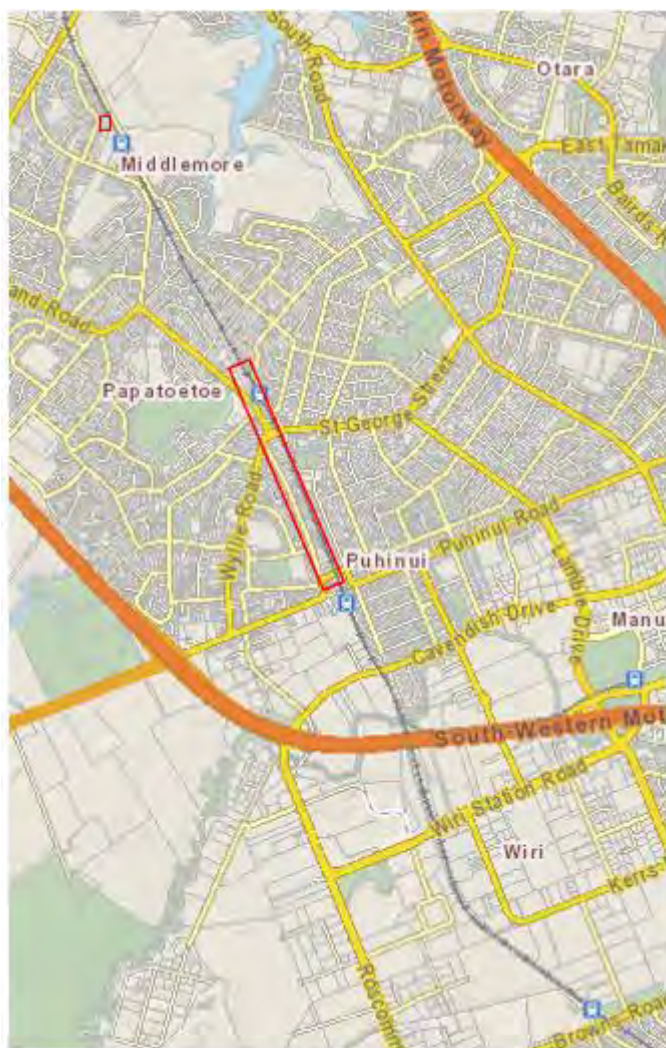


Figure 2.1: Site Location

Table 2.1 : Summary of the site location and description for the four parts comprising the works.

Property Address	Legal Description	Land Use/Zone	Description	Temporary/Permanent Acquisition
Part One				
64 Rosella Road	Lot 13 DP 19404	Existing land use is residential. Zoned as Business – Mixed Use	Entire land parcel of 1,014 m ² required to provide construction access and long-term maintenance access to the corridor	Permanent
100 Hospital Road (82 Gray Avenue)	Part Lot 13 DP 2989	Existing land use is mixed comprising car parks and buildings. Zoned as Special Purpose Zone	Land required to provide space for the third main, the extension of the pedestrian bridge and improved pedestrian connections to Orakau Road.	Permanent 2003m ² Temporary 591 m ²
100 Hospital Road (5 Orakau Road)	Allotment 237 of Parish of Manurewa	Existing land use is entrance to car park (road reserve)	Land required to provide space for the third main.	Permanent 23 m ² Temporary 40 m ²
Part Two				
1 Station Road	Lot 7 DP 11628	Existing land use is residential. Zoned as Residential – Single House Zone	Small strip of land adjacent to the eastern boundary of the land parcel totalling 129 m ² required to support the works.	Temporary
5 Station Road	Lot 6 DP 11628		Small strip of land adjacent to the eastern boundary of the land parcel totalling 120 m ² required to support the works.	Permanent
9 Station Road	Lot 5 DP 11628		Entire land parcel of 781 m ² required to support the works.	Permanent
11 Station Road	Lot 4 DP 11628		Small strip of land adjacent to the eastern boundary of the land parcel totalling 139 m ² required to support the works.	Temporary
15 Station Road	Lot 3 DP 11628		Small strip of land adjacent to the eastern boundary of the land parcel totalling 129 m ² required to support the works.	Temporary
17 Station Road	Lot 2 DP 11628		Small strip of land adjacent to the eastern boundary of the land parcel totalling 116 m ² required to support the works.	Temporary

Property Address	Legal Description	Land Use/Zone	Description	Temporary/Permanent Acquisition
19 Station Road	Lot 1 DP 11628		Small strip of land adjacent to the eastern boundary of the land parcel totalling 134 m ² required to support the works.	Temporary
21R Station Road	Lot 9 DP 11628	Existing land use is recreational. Zoned as Open House – Informal Recreation Zone	Small area of land adjacent to the south-eastern boundary of the land parcel totalling 52 m ² required to support the works.	Partial permanent
18R Gordon Road	Lot 53 DP 20068, PT Allot 36 Parish of Manurewa	Informal recreational reserve (Gordon Park)	Construction access across Council reserve. May also be used as construction site yard	Temporary
Part Three				
12 Wylie Road	Lot 1 DP 152288	12 Wylie Road is an undeveloped site, while 14 Wylie Road is a church car park. Both are zoned as Residential – Terrace Housing and Apartment Buildings Zone.	Small strip of land adjacent to the eastern boundary of the land parcel totalling 1,160 m ² required to support the works. It is noted that the area identified as part of the works at 14 Wylie Road is extremely small Church carpark required for access during construction phase.	Partial permanent Car park temporary for access
14 Wylie Road	Lot 1 DP 136372			
Part Four¹				
74D Kenderdine Road	Lot 5 DP 327717	Existing land use is residential. Zoned as Residential – Mixed House Urban Zone	Small area of land totalling 41 m ² required to support the works	Temporary
76 Kenderdine Road	Part Lot 30 DP 16605		Small strip of land adjacent to the eastern boundary of the land parcel totalling 62 m ² required to support the works	Temporary
78 Kenderdine Road	Part Lot 31 DP 16605		Small strip of land adjacent to the eastern boundary of the land parcel totalling 64 m ² required to support the works	Permanent
80 Kenderdine Road	Part Lot 31 DP 16605		Small strip of land adjacent to the eastern boundary of the land parcel totalling 63 m ² required to support the works	Temporary

¹ This assessment also addresses the flats associated with the Kenderdine Road sites.

Property Address	Legal Description	Land Use/Zone	Description	Temporary/Permanent Acquisition
84 Kenderdine Road	Lot 1 DP 70381		Small strip of land adjacent to the eastern boundary of the land parcel totalling 97 m ² required to support the works	Temporary
88 Kenderdine Road	Lot 2 DP 70381		Small strip of land adjacent to the eastern boundary of the land parcel totalling 103 m ² required to support the works	Temporary
90 Kenderdine Road	Lot 34 DP 16605		Small strip of land adjacent to the eastern boundary of the land parcel totalling 103 m ² required to support the works	Temporary
92 Kenderdine Road	Lot 2 DP 82259		Small strip of land adjacent to the eastern boundary of the land parcel totalling 106 m ² required to support the works	Temporary
8 Bridge Street	Lot 21 DP 136372		Small strip of land across front yard to enable heavy vehicle access to 10 Bridge Street. (77 m ²)	Temporary
9 Bridge Street	Lot 27 DP 21411		Land required for retaining wall construction and occupation. (858 m ²)	Permanent
10 Bridge Street	Lot 22 DP 21411		Land required for retaining wall construction and occupation. (841 m ²)	Permanent

2.2 Zoning Description

Zoning descriptions as recorded in the Auckland Unitary Plan Operative in Part (AUP OP) are also shown in Table 2.1. They comprise the following:

- § Special Purpose – Healthcare Facility and Hospital (Middlemore Hospital)
- § Residential – Terrace Housing and Apartment (12 and 14 Wyllie Road)
- § Residential - Single House (Station Road properties)
- § Residential – Mixed Housing Urban (Kenderdine Road properties)
- § Open Space – Informal Recreation (21R Station Road and Gordon Park).
- § Business – Mixed Use (Rosella Road).

2.3 Geology and Hydrogeology

The properties are situated over Puketoka Formation of the Tauranga Group, which comprises pumiceous mud, sand and gravel, which overlies sandstones and mudstones of the Waitemata Group, as shown in Figure 2.1².

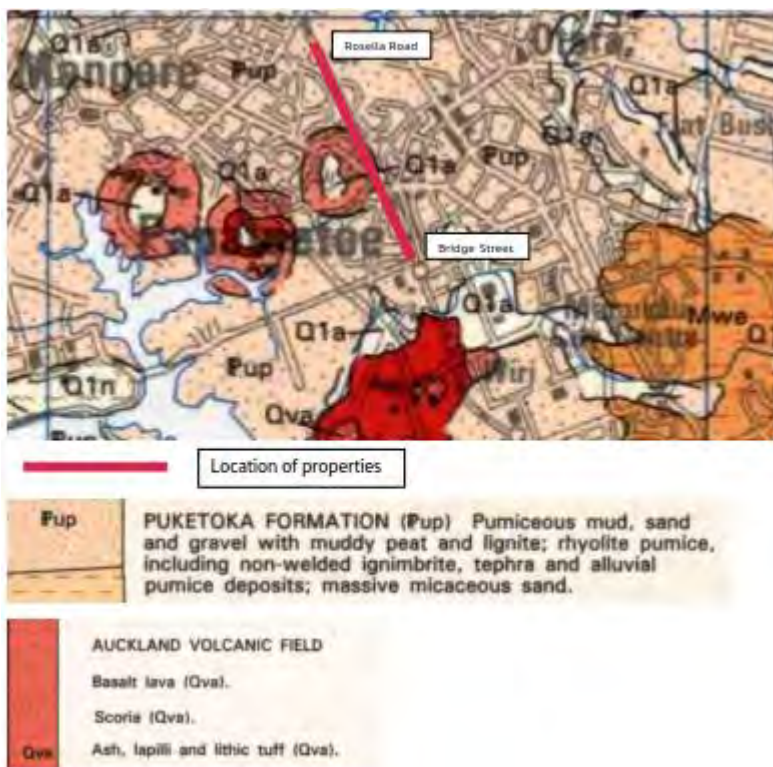


Figure 2.2: Geology¹

Shallow unconfined groundwater may be present within the Puketoka Formation. However, the Puketoka Formation does not constitute a usable aquifer for beneficial groundwater use.

The Waitemata Group forms a regionally important aquifer (Manukau Waitemata Aquifer) which is located in High-Use aquifer management area as defined by AC.

² Edbrooke, S.W. (compiler) 2001: Geology of the Auckland area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences Limited. Institute of Geological & Nuclear Sciences 1:250,000 geological map 3. 74 p. + 1 folded map

3. Review of Available Information

3.1 Site Walkover

No site walkover has been undertaken to date as part of the PSI. Specific site inspections will be undertaken for update of the PSI to support resource consent applications (as required).

3.2 Review of Historical Aerial Imagery

A review of historical aerial imagery from AC GeoMaps³ and Retrolens⁴ was undertaken to identify historical land uses and the potential for associated soil contamination. The land parcels of interest are generally small strips of land mainly located within residential areas dating back to at least 1940. Selected historical aerial imagery only were reviewed given the limited change in land uses since 1940. Selections of the aerial imagery are presented in Appendix B. A summary of the review of historical land use is provided in Table 3.1.

Table 3.1 : Summary of historical land use based aerial imagery review.

Date	Source	General Description
Part One – 64 Rosella Road, 82 Gray Ave and 15 Orakau Road		
1940	Retrolens	64 Rosella Road and 15 Orakau Road are in grass, although some small structures, possibly beehives, are present at 64 Rosella Road. 82 Gray Avenue is comprised of a mixture of land uses; two residential dwellings with associated buildings (e.g., garage/shed) and possible vegetable gardens are present on the southern boundary and centre of the land parcel while the rest of the property is in grass (including the area of interest along the north-eastern boundary of the property). A railway track (including the North Island Main Trunk Line - NIMT) is located immediately to the northeast of all three land parcels (running northwest to southeast). Land use to the north, south, east, and west of the three properties is comprised of a mixture of residential dwellings and areas in grass, possibly agricultural grazing land.
1959	AC GeoMaps	No material change in land use within Part One, although residential dwellings have been constructed to the east and west of the of the three land parcels.
1980	Retrolens	No material change in land use at 64 Rosella Road. In the southern half of 82 Gray Avenue an additional building has been constructed and further earthworks are evident. In the northern part of 82 Gray Avenue one building has been demolished and four additional buildings (including one which extends into 15 Orakau Road) have been constructed as well as a car park. Some development has also occurred on 15 Orakau Road in the form of the aforementioned building and a driveway providing access to the buildings constructed on the northern part of 82 Gray Avenue. These developments are likely associated with Middlemore Hospital. Despite the developments on 82 Gray Avenue and 15 Orakau Road, land use within the area of interest does not appear to have changed.
1996	AC GeoMaps	A residential dwelling has been constructed on 64 Rosella Road. In the southern part of 82 Gray Avenue the residential dwelling along the southern boundary of the property has been demolished and a car park is been built. There is no material change in land use in the northern part of 82 Gray Avenue or 15 Orakau Road.
2001	AC GeoMaps	No material change in land use at 64 Rosella Road, the southern part of 82 Gray Avenue, and 15 Orakau Road. However, in the north part of 82 Gray Avenue the car park has been extended towards the northern boundary of the property, although the car park does not appear to extend in the area of interest adjacent to the northern boundary.
2006	AC GeoMaps	No material change in land use on any of the three land parcels.

³ <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>, accessed 21 May 2020.

⁴ <http://retrolens.nz/>, accessed 21 May 2020.

Date	Source	General Description
2008	AC GeoMaps	No material change in land use at 64 Rosella Road. A building which previously present on both 82 Gray Avenue or 15 Orakau Road has been demolished, although land use within the area of interest does not appear to have changed.
2010/11	AC GeoMaps	No material change in land use at 64 Rosella Road or 15 Orakau Road. Buildings present on the southern half of 82 Gray Avenue have been demolished and replaced with more car parks.
2015/16	AC GeoMaps	No material change in land use at 64 Rosella Road. A new car park has been constructed on the eastern boundary of 82 Gray Avenue which extends into 15 Orakau Road, although land use within the area of interest does not appear to have changed.
2017	AC GeoMaps	Concrete driveway is now present at 64 Rosella Road. No material change in land use on 82 Gray Avenue or 15 Orakau Road.
Part Two – 1 to 21R Station Road and 18R Gordon Road		
1939	Retrolens	Residential dwellings are present on 1 through 19 Station Road. 21 Station Road appears to be in grass. Surrounding land uses include Station Road to the west and south, the railway to the east, and grass to the north.
1959	AC GeoMaps	No material change in land use on 9-21 Station Road. Aerial imagery doesn't cover 1 and 5 Station Road or surrounding land uses. In the wider area residential dwellings have been constructed. 18R Gordon is appears to be tree covered reserve land adjacent to the rail corridor at the end of Gordon Road.
1980	Retrolens	No material change in land use within Part Two or surrounding area.
1996	AC GeoMaps	A garage/shed has been constructed on 17 and 19 Station Road. No material change in land use within Part Two or surrounding area. 21R Station Road may be part of a reserve.
2001	AC GeoMaps	No material change in land use within Part Two or surrounding area. 21R Station Road appears to be part of a reserve. 18R Gordon is appears to be grassed reserve land adjacent to the rail corridor at the end of Gordon Road. Carparking and hard courts and possible recreation centre building have been established to the southwest and south of the reserve (Gordon Park).
2006	AC GeoMaps	An additional residential dwelling has been constructed on 9 Station Road. No material change in land use within Part Two or surrounding area with the exception of construction of a footbridge over the railway line which extends into the northern half of 21 Station Road.
2008	AC GeoMaps	No material change in land use within Part Two or surrounding area.
2010/11	AC GeoMaps	No material change in land use within Part Two or surrounding area.
2015/16	AC GeoMaps	Garage/car port and possible extensions to the residential dwelling on 5 Station Road (Lot 6 DP 11628) have been built.
2017	AC GeoMaps	No material change in land use within Part Two or surrounding area.
Part Three – 12 and 14 Wyllie Road		
1939	Retrolens	Both 12 Wyllie Road and 14 Wyllie Road appear to be vacant land covered in grass, shrubs, and trees. Surrounding land uses include the St George Street road corridor to the north, grass and some residential dwelling to the west and south, and the railway to the east.
1959	AC GeoMaps	No material change in land use. Construction of residential dwellings to the west.
1980	Retrolens	No material change in land use on 12 Wyllie Road or surrounding areas with the exception of further construction of residential dwellings to the west and construction of the Presbyterian Church and car parks at 14 Wyllie Road.
1996	AC GeoMaps	No apparent change in land use within Part Three or surrounding area.
2001	AC GeoMaps	No apparent change in land use within Part Three or surrounding area.
2006	AC GeoMaps	No apparent change in land use within Part Three or surrounding area.
2008	AC GeoMaps	No apparent change in land use within Part Three or surrounding area.
2010/11	AC GeoMaps	Minor earthworks are evident at 12 Wyllie Road. No apparent change in land in the surrounding area.

Date	Source	General Description
2015/16	AC GeoMaps	No apparent change in land use within Part Three or surrounding area. Grass has grown back where the minor earthworks occurred.
2017	AC GeoMaps	No apparent change in land use within Part Three or surrounding area.
Part Four – 74-92 Kenderdine Road and 6 to 10 Bridge Street		
1939	Retrolens	Aerial imagery is difficult to decipher. It appears to be dwellings/buildings present or under construction at 74D Kenderdine Road and 90 Kenderdine Road. The other land parcels in Part Four appear to be in grass with some trees present. Surrounding land uses include the railway to the east and semi-rural land in grass to the north, south, and west. Kenderdine Road and Bridge Street are formed.
1959	AC GeoMaps	Residential dwellings have been constructed on all land parcels within Part Four, with the exception of 74D Kenderdine Road. 74D Kenderdine Road appears to have been planted in horticultural crops (vegetable/market garden). Glasshouses and/or poultry barns are present immediately north of 74D Kenderdine Road. Surrounding land uses do not appear to have changed significantly, although additional residential dwellings have been constructed in the general area.
1980	Retrolens	Terrace style housing has been constructed on a number of properties (e.g., 84-90 Kenderdine Road), replacing the residential dwellings previously present at these properties. 74D Kenderdine Road no longer appears to be planted in horticultural crops and now appears to be in grass. Glasshouses and/or poultry barns are still present immediately north of 74D Kenderdine Road. No material changes in the surrounding land uses beyond the continued construction of residential dwellings.
1996	AC GeoMaps	No material change in land use within Part Four with the exception of construction of additional residential dwellings on some properties, including at 74D Kenderdine Road. Houses have replaced the glasshouses and/or poultry barns to the north. No apparent changes in land use in the surrounding area.
2001	AC GeoMaps	No material change in land use within Part Four or surrounding area.
2006	AC GeoMaps	No material change in land use within Part Four or surrounding area.
2008	AC GeoMaps	No material change in land use within Part Four or surrounding area.
2010/11	AC GeoMaps	No material change in land use within Part Four or surrounding area.
2015/16	AC GeoMaps	No material change in land use within Part Four or surrounding area.
2017	AC GeoMaps	No material change in land use within Part Four or surrounding area.

3.3 Auckland Council Site Records

Based on an initial review of the historical aerial imagery, seven representative properties were identified where AC records could assist in identifying the potential for soil contamination and/or HAIL status. These properties comprised mainly reserve/park land in addition to 74 Kenderdine Road where horticultural activities were identified in early aerial photographs. Therefore, an enquiry was sent by Jacobs to AC (recontamination@aklc.govt.nz) on 21 May 2020 requesting council records or other information on the HAIL status of the properties.

AC's response is presented in Table 3.2 and is presented in Appendix C.

Table 3.2 : Summary of AC's response to Jacobs contamination enquiry.

Property Address	Legal Description	Auckland Council's Response
Part One		
64 Rosella Road	Lot 13 DP 19404	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.

Property Address	Legal Description	Auckland Council's Response
82 Gray Avenue	Part Lot 13 DP 2989	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Additionally, due to the age of the buildings on site the potential for asbestos and/or lead paint to be present may need to be considered.
5 Orakau Road	Allotment 237 of Parish of Manurewa	
Part Two		
1 Station Road	Lot 7 DP 11628	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Additionally, due to the age of the dwelling on site the potential for presence of asbestos and/or lead paint may need to be considered.
21R Station Road	Lot 9 DP 11628	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.
Part Three		
12 Wyllie Road	Lot 1 DP 152288	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.
Part Four		
74C/D Kenderdine Road	Lot 4 DP 327717 & Lot 5 DP 327717	No contamination information held within AC records. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Due to the age of the dwelling on site the potential for presence of asbestos and/or lead paint may need to be considered. In addition to this, Council's GIS aerial records indicate possible horticultural activity on 74D Kenderdine Road and a glasshouse on 74C Kenderdine Road.

3.4 New Zealand Geotechnical Database Borehole Logs

The NZGD was interrogated for ground contamination information at the properties subject to the NOR. Screenshots of maps from NZGD along the alignment showing available borehole information is presented in Appendix D. Eighteen (18) records were identified that contained geotechnical information, including soil type and groundwater levels. In general, the borehole logs recorded natural ground below a thin layer of topsoil, with occasional surficial gravel fill also recorded. No information on soil or groundwater contamination was recorded.

3.5 Discussion

The assessment indicates that the properties were generally in agricultural land use prior to about 1940, with increasing urbanisation to the form the mainly residential suburb which characterises the area today. The agricultural land use appears to have been primarily grazing land, although localised horticultural land use is also possible, as evidenced by the presence of probable greenhouses and gardens at 74 Kenderdine Road, extending onto 74D Kenderdine Road, seen in the aerial images from 1959 and 1980. The size of the buildings on the property indicate commercial scale operations.

The NIMT rail corridor lies to east of the properties (present in 1940) and borders all of the properties except 8 Bridge Street. The properties also include two informal recreational parks and one piece of undeveloped land, which appear to have been formed from agricultural land in conjunction with the progressive residential development. No landfilling or level raising fill activities are evident.

The properties also include Middlemore Hospital, which was constructed between 1959 and 1980.

The pieces of land which could be subject to soil disturbance are currently mainly either part of residential lawns/garden or informal recreational parks and undeveloped land, or in the case of 100 Hospital Road, in soft landscaping adjacent to carparking at Middlemore Hospital and Middlemore station.

3.5.1 HAIL Assessment

On the basis of the aerial imagery and information obtained from AC, it is interpreted that all of the residential properties, except 74D Kenderdine Road, are not likely to be HAIL. It is noted however, that given the age of many of the dwellings, lead from lead based paint and asbestos from degradation of building materials could be present in soil, close to the buildings. The potential for the presence of fill associated with rail corridor activities is also noted.

In terms of the informal recreational areas, no evidence of landfill or the use level raising fill to form the parks has been identified (HAIL G3. *Landfill sites*). In addition, although some pesticide/herbicide use is likely, intensive use of these products as defined by HAIL A10. - *Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds*, is considered to be unlikely.

Horticultural activities are classified as HAIL A 10 – *Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds*. The potential for commercial scale horticultural activities to have occurred at 74 Kenderdine indicates that 74D Kenderdine Road is HAIL.

In relation to Middlemore Hospital, although hospitals are not listed as HAIL, some activities undertaken as part of hospital operations are HAIL. These potentially include:

- § A3. - *Commercial analytical laboratory sites*
- § A17. - *Storage tanks or drums for fuel, chemicals or liquid waste*
- § B2. - *Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment.*

The land parcels potentially subject to soil disturbance close to Middlemore Hospital do not appear to be associated with these HAIL activities.

The HAIL list is presented in Appendix E.

4. Conclusions & Recommendations

4.1 Conclusions

The potential for commercial scale horticultural activities to have occurred at 74 Kenderdine indicates that 74D Kenderdine Road is HAIL. Horticultural activities are classified as HAIL A 10 – *Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds*. No other sites potentially subject to soil disturbance associated with the works under Package 1, which are mainly either part of residential lawns/garden or informal recreational parks and undeveloped land or in the case of 100 Hospital Road, in soft landscaping adjacent to carparking at Middlemore Hospital and Middlemore station, have been identified as HAIL.

Notwithstanding, the presence of contaminants in soil above background levels could be present at all or some locations, relating to specific activities not identified in the current PSI and/or related to lead-based paint and asbestos containing materials (ACM) associated with site buildings. Such contamination, if present, would be expected to be localised, for example, in case of lead and asbestos, located close to site buildings.

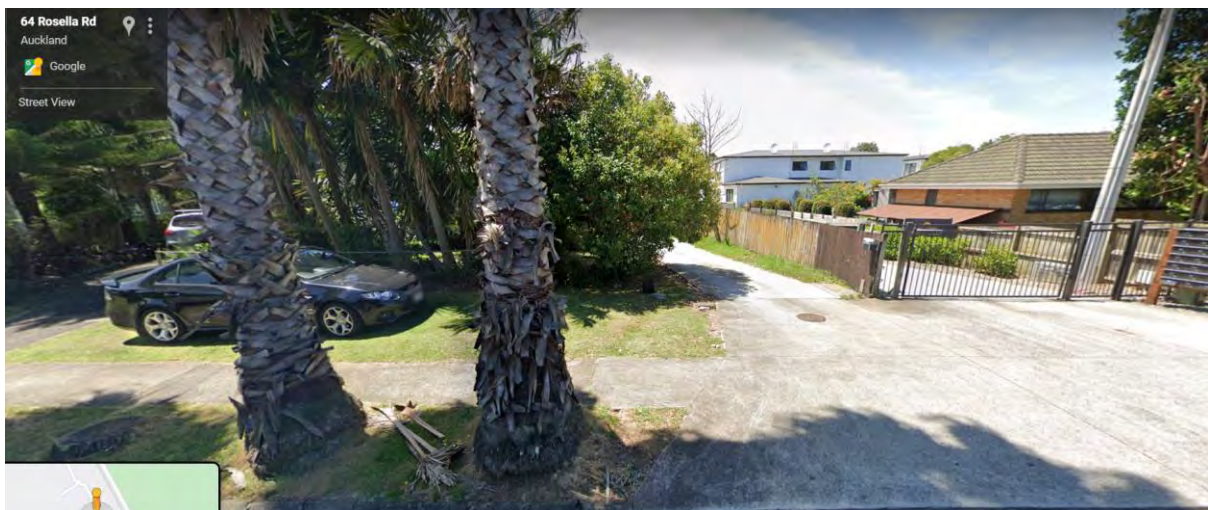
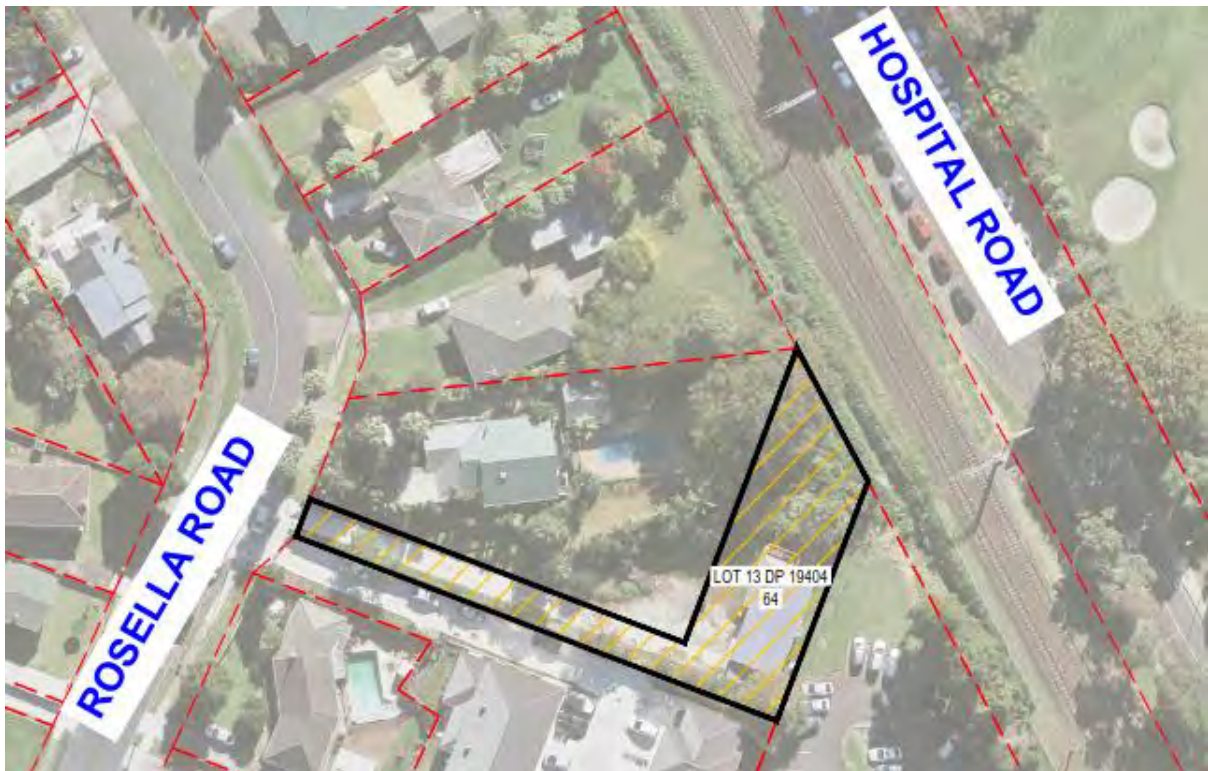
4.2 Recommendations

This PSI has assessed the contamination status of properties potentially affected by soil disturbance activities during the Package 1 works. It is recommended that this assessment is updated following confirmation of the properties subject to soil disturbance and soil disturbance activities to be undertaken. This update should include site walk over inspection.

It is also noted that the wider project will require a land use consent under the NESCS and a discharge permit under the AUP OP for contamination related matters. It is recommended that the sites discussed in this PSI are included within the scope of any site management plan (SMP) required by those resource consents

Appendix A. Site Information

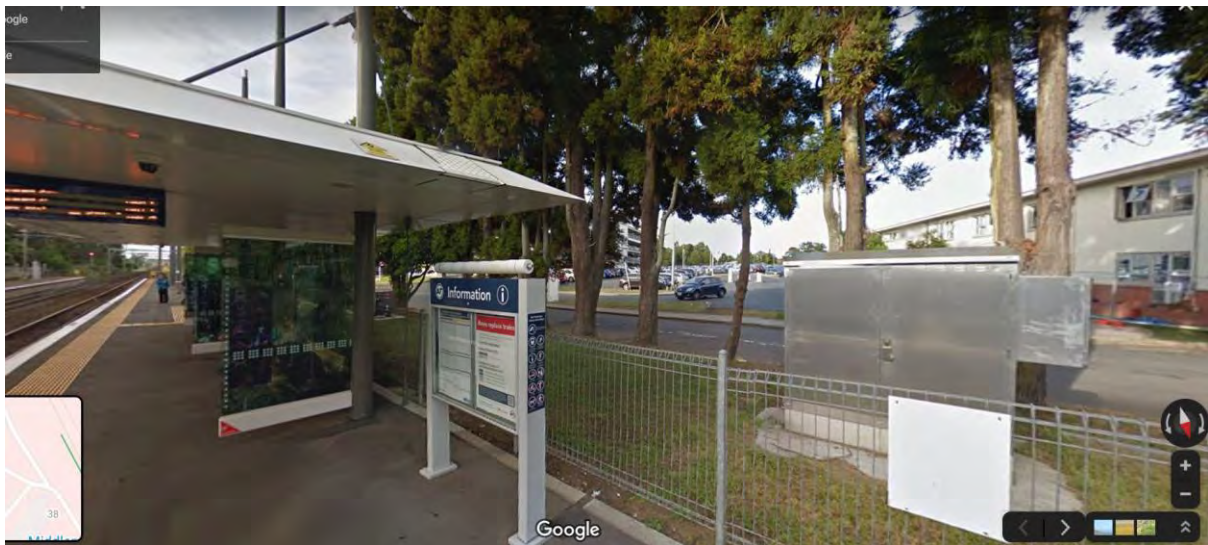
64 Rosella Road Mangere East



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
64 Rosella Road, Mangere East	Lot 13 DP 19494	Residential	1,014	Whole Property	Full Permanent

100 Hospital Road (82 Gray Street and 15 Orakau Road)





100 Hospital Road (82 Gray Ave and 15 Orakau Road)

Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
100 Hospital Road, Papatoetoe	Allotment 237 Parish of Manurewa (5 Orakau Rd), Part Lot 13 DP 2989 (83 Gray Ave)	Carpark	2,026	Soft landscaped entrance to hospital car park	Permanent
			631		Temporary

12 & 14 Wyllie Rd



12 Wyllie Rd -strip of land in background (Presbyterian Church not affected). Church car park/lawn at 14 Wyllie Road required for construction access.

Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
12 Wyllie Road, Papatoetoe	Lot 1 DP 152288	Park/reserve	1,165	Strip of parkland adjacent to rail corridor	Partial permanent
14 Wyllie Road	Lot 1 DP 136372	Church	924	Church car park	Temporary

18R Gordon Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
18R Gordon Road	Lot 53 DP 20068, PT Allot 36 parish of Manurewa	Informal recreational reserve	2274	Construction access across Council reserve. May also be used as construction site yard	Temporary

21R Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
21R Station Road, Papatoetoe	Lot 9 DP 111628	Park	52	SE corner of parkland adjacent to rail corridor	Partial permanent

19 Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
19 Station Road, Papatoetoe	Lot 1 DP 111628	Residential	134	Strip to rear adjacent to rail corridor	Temporary lease

17 Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
17 Station Road, Papatoetoe	Lot 2 DP 111628	Residential	116	Strip to rear adjacent to rail corridor	Temporary lease

15 Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
15 Station Road, Papatoetoe	Lot 3 DP 111628	Residential	129	Strip to rear adjacent to rail corridor	Temporary lease

11 Station Road (no #13)



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
11 Station Road, Papatoetoe	Lot 4 DP 111628	Residential	139	Strip to rear adjacent to rail corridor	Temporary lease

9 Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
9 Station Road, Papatoetoe	Lot 5 DP 111628	Residential	781	Whole site	Full Permanent

5 Station Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
5 Station Road, Papatoetoe	Lot 6 DP 111628	Residential	120	Not shown	Full Permanent

1 Station Road



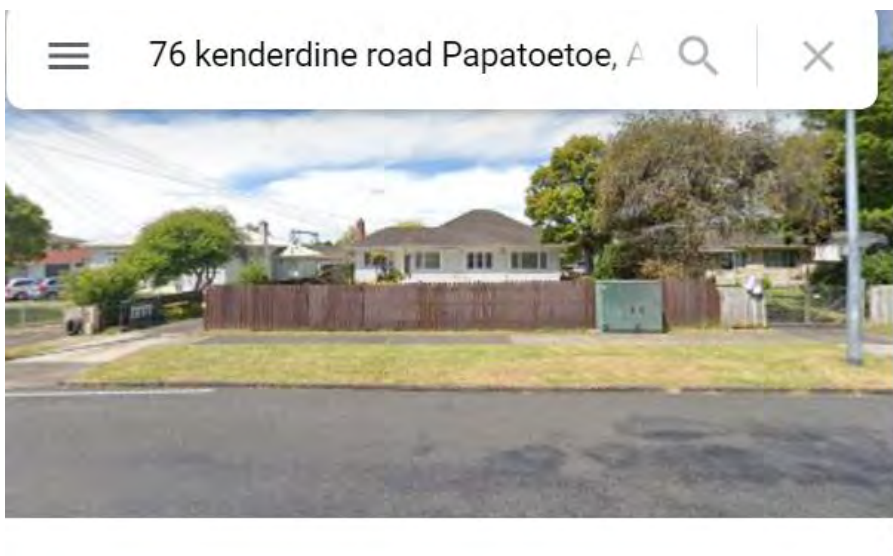
Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
1 Station Road, Papatoetoe	Lot 7 DP 111628	Residential	129	Strip to rear adjacent to rail corridor	Temporary lease

74D Kenderdine Road



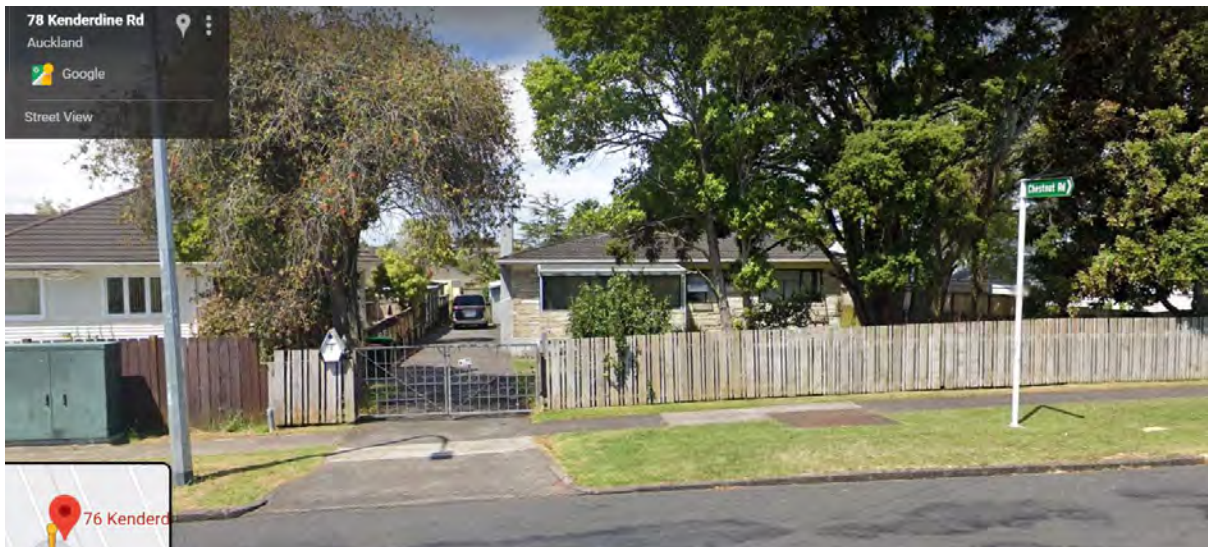
Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
74D Kenderdine Road, Papatoetoe	Lot 5 DP 327717 ¼ Lot 6 DP 327717	Residential	41	Contractor occupation	Temporary

76 Kenderdine Road



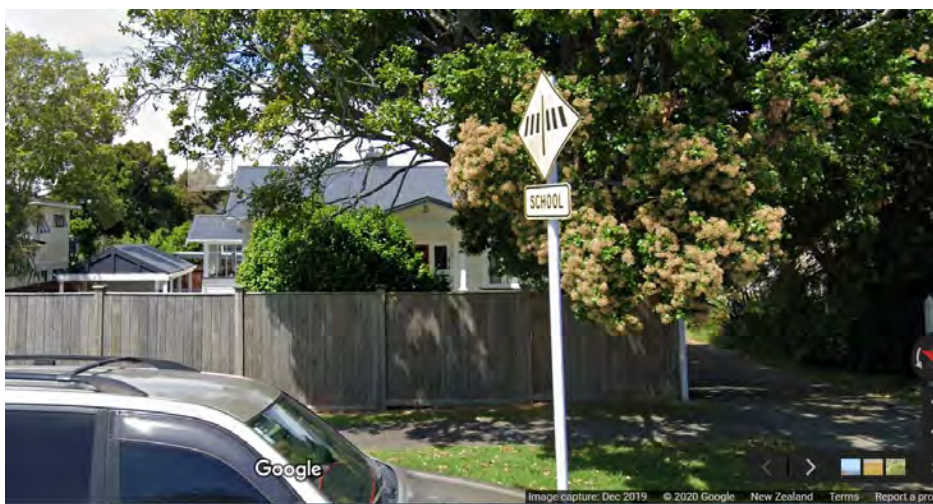
Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
76 Kenderdine Road, Papatoetoe	Pt Lot 30 DP 16605, Flat 1-4 DP 80955	Residential 4 No. dwellings	62	Strip to rear adjacent to rail corridor	Temporary Lease

78 Kenderdine Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
78 Kenderdine Road, Papatoetoe	Pt Lot 30 DP 16605, Pt Lot 31 DP 16605	Residential	64	Strip to rear adjacent to rail corridor	Permanent

80 Kenderdine Road



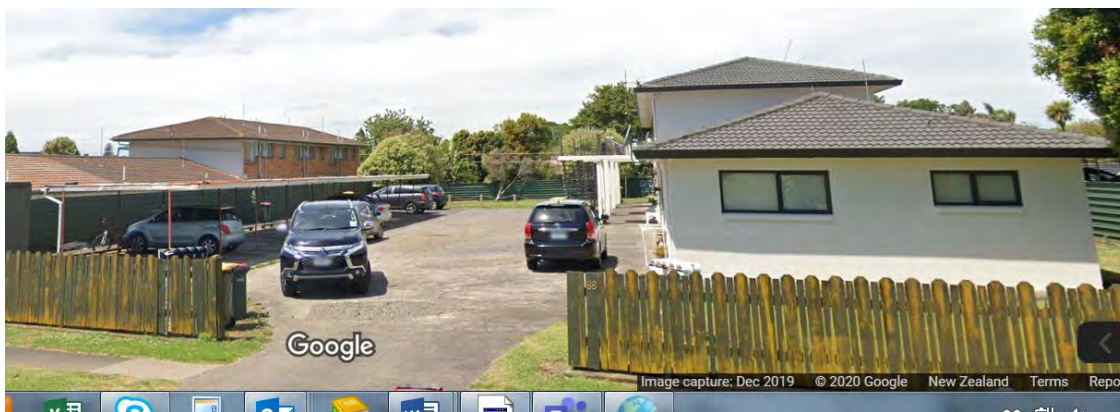
Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
80 Kenderdine Road, Papatoetoe	Part Lot 31 DP 16605	Residential 2? No. dwellings	63	Strip to rear adjacent to rail corridor	Temporary lease

84 Kenderdine Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
84 Kenderdine Road, Papatoetoe	Lot 1 DP 70381	Residential Flats 9 No.	97	Strip to rear adjacent to rail corridor	Temporary lease

88 Kenderdine Road



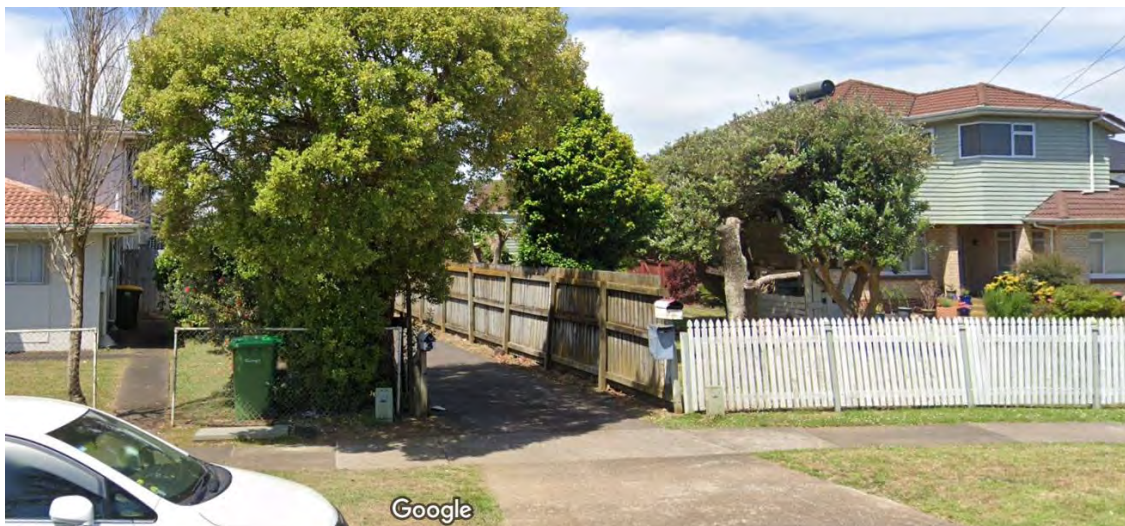
Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
88 Kenderdine Road, Papatoetoe	Lot 2 DP 70381	Residential	103	Strip to rear adjacent to rail corridor	Temporary lease

90 Kenderdine Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
90 Kenderdine Road, Papatoetoe	Lot 34 DP 16605	Residential Flats (11 No.)	103	Strip adjacent to rail corridor	Temporary Lease

92 Kenderdine Road



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
92 Kenderdine Road, Papatoetoe	Lot 2 DP 82259	Residential 3 No. dwellings	106	Strip to rear adjacent to rail corridor	Temporary lease

10 Bridge Street



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
10 Bridge Street, Papatoetoe	Lot 22 DP 21411	Residential	841	Strip adjacent to rail corridor	Permanent

9 Bridge Street



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
9 Bridge Street, Papatoetoe	Lot 27 DP 21411	Residential	858	Strip adjacent to rail corridor	Full Permanent

8 Bridge Street



8 Bridge Street, Papatoetoe, Auck



Property address	Legal Description	Land use	Area Required m2	Description	Temporary or Permanent Acquisition
8 Bridge Street	Lot 21 DP 136372	Residential	77	Small strip of land across front yard to enable heavy vehicle access to 10 Bridge Street.	Temporary

Appendix B. Historical Aerial Imagery

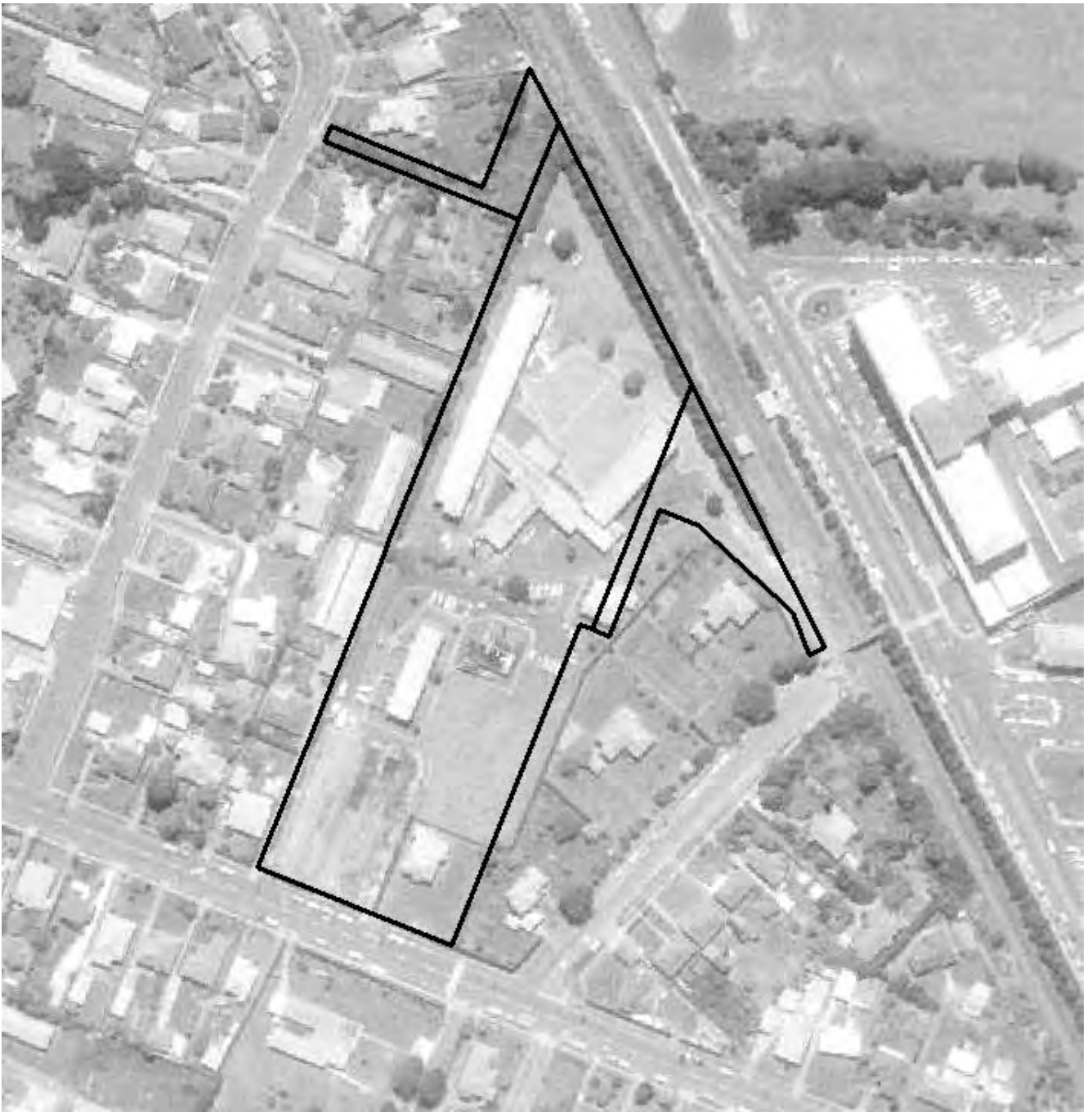
Part One – 64 Rosella Road, 82 Gray Avenue, and 15 Orakau Road



Historical aerial imagery from 1940 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1959 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1980 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.

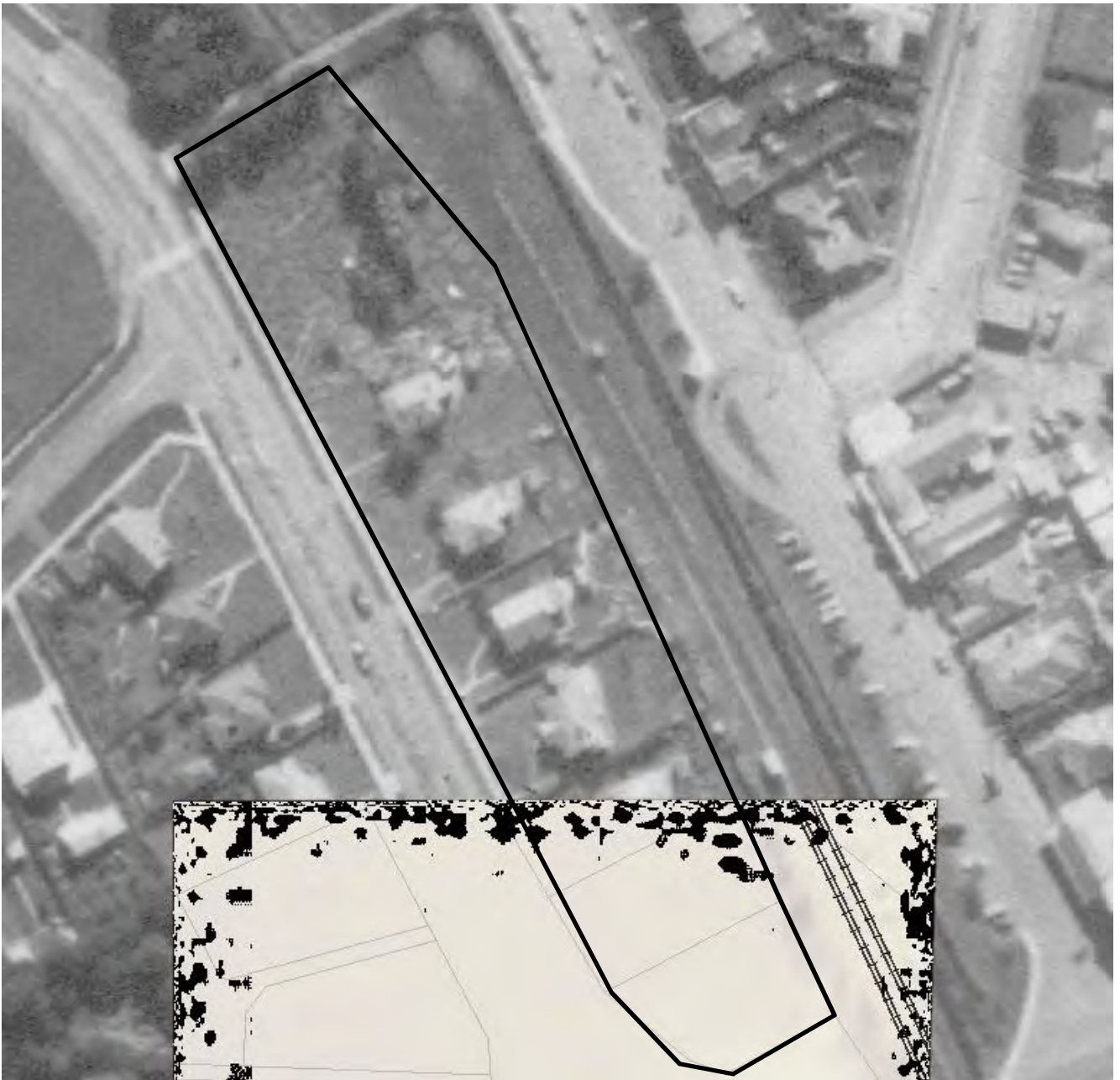


Historical aerial imagery from 1996 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.

Part Two – 1-21 Station Road



Historical aerial imagery from 1939 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1959 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1959 (Sourced from Auckland Council GEOMAPS). Approximate boundary of 18R Gordon Road shown.



Historical aerial imagery from 1980 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 2001 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 2001 (Sourced from Auckland Council GEOMAPS). Approximate boundary of 18R Gordon Road shown.

Part Three – 12 & 14 Wyllie Road



Historical aerial imagery from 1939 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1956 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.

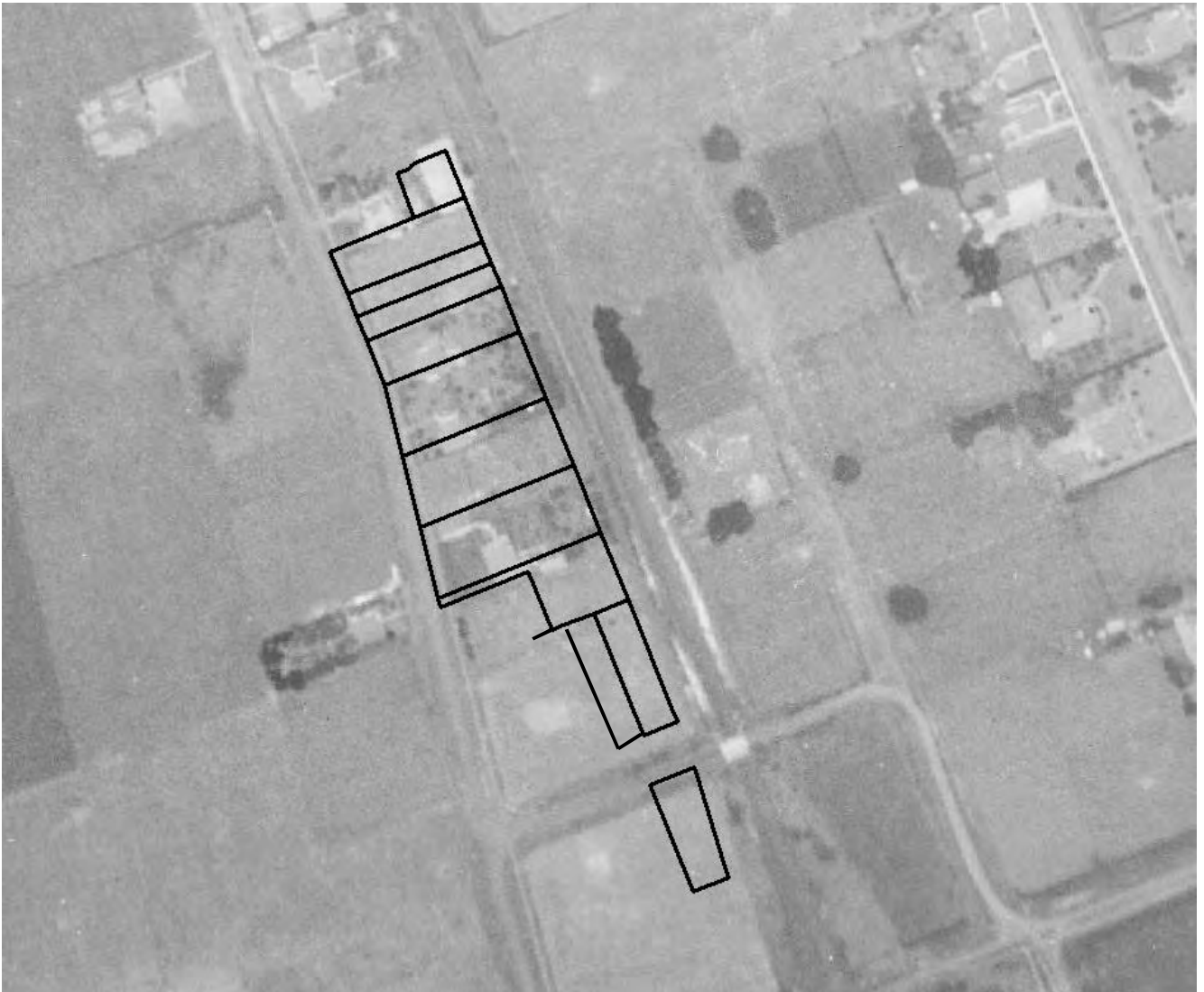


Historical aerial imagery from 1980 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 2001 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.

Part Four –Kenderdine Road & Bridge Street



Historical aerial imagery from 1939 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1959 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 1980 (Sourced from Retrolens). Approximate boundary of land parcels of interest is shown in black.



Historical aerial imagery from 2001 (Sourced from Auckland Council GEOMAPS). Approximate boundary of land parcels of interest is shown in black.

Appendix C. AC Contamination Enquiry Response

From: Rachel Terlinden <rachel.terlinden@aucklandcouncil.govt.nz> **On Behalf Of**
RECContamination
Sent: Friday, 29 May 2020 4:26 PM
To: Tearney, Kevin <Kevin.Tearney@jacobs.com>
Subject: [EXTERNAL] RE: Contaminated Land/HAll status query

Hi Kevin,

This email is in response to your recent enquiry requesting available site contamination information that was held within the Environmental Health Unit of the Licensing and Compliance Services Department (LCS).

There is no contamination information held within our records for the site 64 Rosella Road, Mangere East. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.

There is no contamination information held within our records for the site 100 Hospital Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Additionally, due to the age of the buildings on site the potential for asbestos and/or lead paint to be present may need to be considered.

There is no contamination information held within our records for the site 12 Wyllie Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.

There is no contamination information held within our records for the site 21R Station Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.

There is no contamination information held within our records for the site 1 Station Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Additionally, due to the age of the dwelling on site the potential for presence of asbestos and/or lead paint may need to be considered.

There is no contamination information held within our records for the site 74D Kenderdine Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Due to the age of the dwelling on site the potential for presence of asbestos and/or lead paint may need to be considered. In addition to this, Council's GIS aerial records indicate possible horticultural activity on site.



There is no contamination information held within our records for the site 74C Kenderdine Road, Papatoetoe. However, due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site. Due to the age of the dwelling on site the potential for presence of asbestos and/or lead paint may need to be considered. In addition to this, Council's GIS aerial records indicate possible horticultural activity on site in the form of a potential glasshouse.



Please note that only council's soil contamination records within the LCS department and GIS map have been checked. There may be other soil contamination information held within:

1. A Contaminated Sites Enquiry report, which contains the following information only:
(A search area of radius 200m is applied by default)

- Pollution Incidents (incl. air discharges, oil or diesel spills)
- Bores
- Contaminated site, air discharge and industrial trade process consents
- Closed Landfills (council- owned closed landfill sites only)
- Air quality permitted activities

How to apply for a Contaminated Sites Enquiry Response: DO NOT apply for this as part of a Property File request. Please follow this link -->

<https://www.aucklandcouncil.govt.nz/building-and-consents/types-resource-consents/earthworks/Pages/order-site-contamination-enquiry-report.aspx>

Please take note of the following when applying:

- Apply under the Company Name if request is on behalf of the company.
- Legal Description(s) of the physical site(s) is/are stated clearly. This is to ensure accurate representation of data.
- Enter preferred Postal Address or PO Box instead of physical address of company.
- Contact Person: Please enter your full name, including e-mail address.

2. Property File for viewing reports or all relevant information relating to the property -Requested from the local service centre, by phone, 09 3010101.

Please note:

If you are demolishing any building that may have asbestos containing materials (ACM) in it:

1. *You have obligations under the relevant regulations for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
2. *Work may have to be carried out under the control of the person holding a WorkSafe NZ Certificate of Competence (CoC) for restricted works.*
3. *If any ACM is found, removal or demolition will have to meet the requirements of the Health and Safety at Work (Asbestos) Regulations 2016.*
4. *Information on asbestos containing materials and your obligations can be found at www.worksafe.govt.nz.*

If ACM is found on site following the demolition or removal of the existing buildings, you may be required to remediate the site and carry out validation sampling. Dependent on the amount of soil disturbance a further consent application may be required.

Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. Older paints dating from before 1945 often contained extremely high levels of lead. Dust and flakes from painted surfaces in poor condition are a major cause of lead poisoning in both adults and children.

You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property. Very sensitive uses such as residential with young children, childcare centres, play areas or recreational land should be considered as high risk. In services or working environments other regulatory requirements may require risk assessment and mitigation.

Ngā mihi,
Rachel

**Rachel Terlinden | Technical Officer – Contamination, Air & Noise
Specialist Input | Resource Consents**

Mob 021956763

Auckland Council, Level 2, 35 Graham Street, Auckland

Visit our website: www.aucklandcouncil.govt.nz

From: Tearney, Kevin <Kevin.Tearney@jacobs.com>
Sent: Thursday, 21 May 2020 2:03 PM
To: RECContamination <reccontamination@aklc.govt.nz>
Subject: Contaminated Land/HAIL status query

Kia ora,

I am enquiring as to whether there are any council records or information held by Auckland Council that indicates the land parcels listed below, which are all located between Middlemore Hospital and Puhinui Station, are HAIL sites or have the potential to be HAIL sites?

- 64 Rosella Road Mangere East, Lot 13 DP 19494;
- 100 Hospital Road Papatoetoe, Allotment 237 Parish of Manurewa, Part Lot 13 DP 2989 Lot 10 DP 19627;
- 12 Wyllie Road Papatoetoe, Lot 1 DP 152288
- 21R Station Road Papatoetoe, Lot 9 DP 111628
- 1 Station Road Papatoetoe, Lot 7 DP 111628
- 74D Kenderdine Road Papatoetoe LOT 5 DP 327717, 1/4 SH LOT 6 DP 327717
- 74 C Kenderdine Road Papatoetoe LOT 4 DP 327717, 1/4 SH LOT 6 DP 327717

A response by Friday 29 May would be appreciated.

Thank you

Nga Mihi

Regards

Kevin Tearney, MSc, CEnvP SC | Jacobs | Principal Consultant - Environmental Solutions
+64 4 914 8472 | +64 29 496 3765 | kevin.tearney@jacobs.com
Level 8, 1 Grey Street Wellington 6011, New Zealand www.jacobs.com

NOTICE - This communication may contain confidential and privileged information that is for the sole use of the intended recipient. Any viewing, copying or distribution of, or reliance on this message by unintended recipients is strictly prohibited. If you have received this message in error, please notify us immediately by replying to the message and deleting it from your computer.

Have your say on Auckland's Emergency Budget 2020/2021.

*Together we can
recover stronger.*

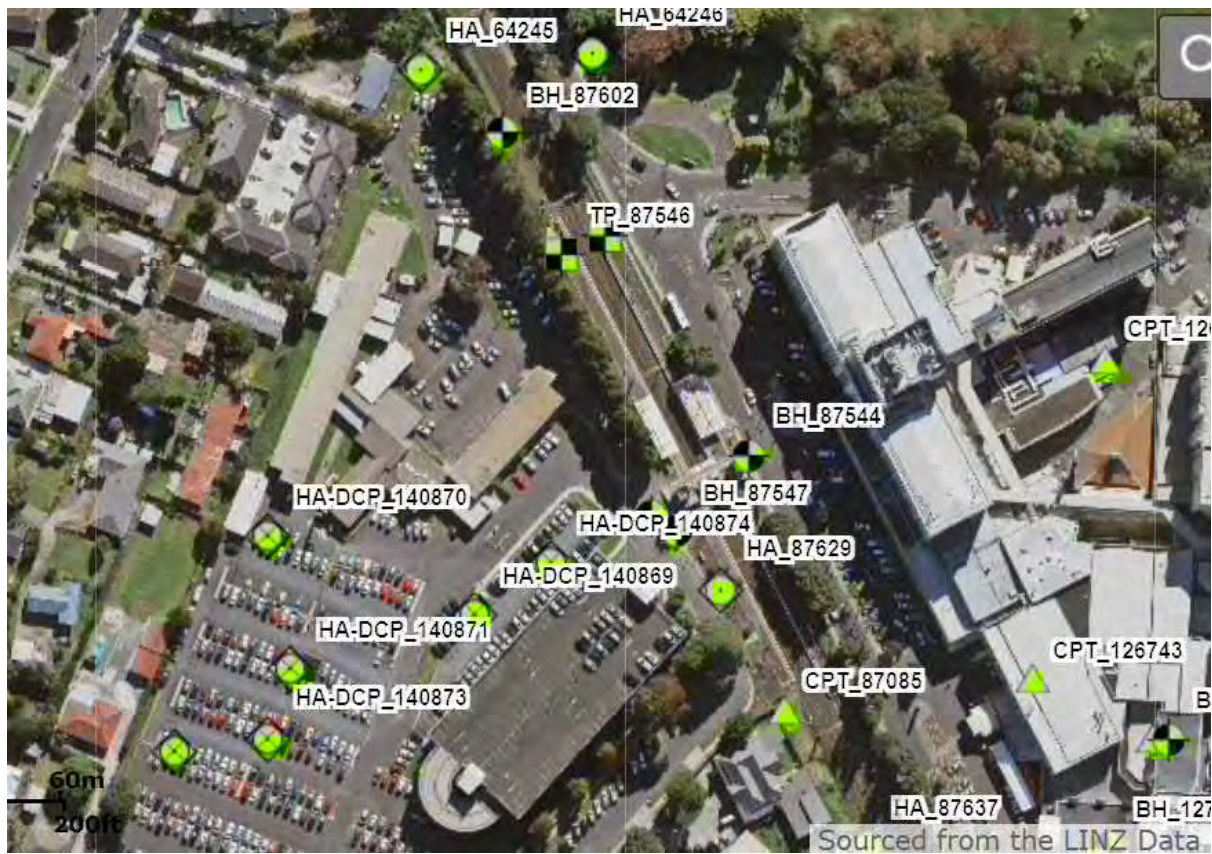
Find out more 



CAUTION: This email message and any attachments contain information that may be confidential and may be LEGALLY PRIVILEGED. If you are not the intended recipient, any use, disclosure or copying of this message or attachments is strictly prohibited. If you have received this email message in error please notify us immediately and erase all copies of the message and attachments. We do not accept responsibility for any viruses or similar carried with our email, or any effects our email may have on the recipient computer system or network. Any views expressed in this email may be those of the individual sender and may not necessarily reflect the views of Council.

Appendix D. NZGD Records

Part 1 Rosella Road and Hospital Road





PROJECT: Middlemore Station
 CLIENT: ARTNL
 LOCATION: Western platform Middlemore Station
 JOB No.: 51/20265/05
 LOGGED BY: SL
 CHECKED BY: TD
 COMMENCED: 14/11/05
 COMPLETED: 14/11/05

Borehole No.: BH 1

Page: 1 of 3

CONTRACTOR: Pro Drill
 EQUIPMENT: Small Kubota Tractor
 INCLINATION (deg): - DIAMETER (mm): -
 X-COORDINATE: - Y-COORDINATE: -
 R.L. SURFACE (m): - TOTAL DEPTH (m): 23m

Depth (m)	Geological Group	DESCRIPTION OF CORE Geological Formation (name, weathering, relative strength, colour, cement, defect type, lithological features, bedding, foliation, mineralogy, etc)	SPT Blow Count	Test Result SPT 'N' Value Shear Strength (kPa)	Core Loss (%)	Spacing of Natural Defects (m)	Graphic Log	DEFECT DESCRIPTION (defect type, attitude, spacing, continuity, roughness, infilling etc) SOIL DESCRIPTION (minor MAJOR subordinate, consistency, water content, plasticity/relative density, grading, etc)	Piezometer Details and Water Levels	Water Loss (%)	Drilling Method
0		Railway platform						Ground Surface			
	Fill	Fill: Embankment for platform						Asphalt			
		Fill: Engineered fill						GRAVEL with some sand and silt, well packed, dry, medium density, grey brown			
		Puketoka Formation- Fine grained pumiceous and micaceous sands, silts and muds with interbedded peats						silty CLAY, soft to firm, moist, slightly plastic, mottled orange brown			
1	Tauranga Group		1 2 1	N = 3				CLAY with some silt, firm, moist, moderately to highly plastic, alternating grey yellow orange brown bands	Standing @ 15/11/05		
2								clayey SILT, firm to stiff, moist, slightly plastic, mottled yellow grey with medium grey SILT inclusions			
3			1 3 0	N = 1				fine pumiceous SAND with some clay, soft, moist to wet, mottled grey yellow light brown			
4							CLAY with a trace of silt, soft to firm, moist, moderately to highly plastic, brown orange with black streaks				
5		0 0 1	N = 1				SILT with some clay, firm to stiff, moist, black, organic staining, frequent fibrous inclusions- peaty material				
6							organic CLAY with some silt, soft to firm, moist to wet, moderately plastic, dark grey with black streak, occasional very thin pumiceous fine SAND layers				
7		1 2 0	N = 5				silty CLAY with some sand, soft to firm, moist, slightly to moderately plastic, medium grey				
8							pumiceous SAND with some silt, firm to stiff, wet, dark brown yellow grey				
9		1 2 2	N = 4				CLAY with some silt, soft to firm, slightly to moderately plastic, wet, light grey green alternating with fine layers of micaceous fine SAND with some silt, firm to stiff, wet, medium grey				
10							CLAY, soft, moist, moderately plastic, brown grey				
							CLAY with some silt, soft to firm, moderately plastic, wet, light grey green alternating with fine layers of micaceous fine SAND with some silt, firm to stiff, wet, medium grey				
		4 17 20	N = 37				fine SAND, firm to stiff, wet, medium density, light to medium grey				

Core Boxes -
 Shear Vane -
 Factor (as per NZGS Guideline)
 Core will be stored for 3 months only unless alternative arrangements are made



PROJECT: Middlemore Station
 CLIENT: ARTNL
 LOCATION: Western platform Middlemore Station
 JOB No.: 51/20265/05
 LOGGED BY: SL
 CHECKED BY: TD
 COMMENCED: 14/11/05
 COMPLETED: 14/11/05

Borehole No.: BH 1

Page: 2 of 3

CONTRACTOR: Pro Drill
 EQUIPMENT: Small Kubota Tractor
 INCLINATION (deg): - DIAMETER (mm): -
 X-COORDINATE: - Y-COORDINATE: -
 R.L. SURFACE (m): - TOTAL DEPTH (m): 23m

Depth (m)	Geological Group	DESCRIPTION OF CORE Geological Formation: (name, weathering, relative strength, colour, cement, defect type, lithological features, bedding, foliation, mineralogy, etc)	SPT Blow Count	Test Result SPT 'N' Value Shear Strength (kPa)	Core Loss (%)	Spacing of Natural Defects (m)	Graphic Log	DEFECT DESCRIPTION (defect type, attitude, spacing, continuity, roughness, infilling etc) SOIL DESCRIPTION (minor MAJOR subordinate, consistency, water content, plasticity/relative density, grading, etc)	Piezometer Details and Water Levels	Water Loss (%)	Drilling Method
11	Tauranga Group		2 2	N = 5							Open barrel
12			1 2	N = 5			SILT with some clay and sand, firm to soft, wet, medium density, light grey with medium grey bands of SAND with some silt and clay, soft to firm, wet, medium density				
13			1 3 1	N = 4				clayey SILT, soft to firm, moist to wet, slightly to moderately plastic, light grey brown			
14			1 1 0	N = 1				SILT with trace fine sand, stiff, moist, medium density, light brown CLAY with some silt, firm to stiff, moist, moderately plastic, light grey brown			
15			3 3 4	N = 7				CLAY with some silt, soft, moderately plastic, medium grey green			
16			4 4 5	N = 9				CLAY with trace silt, soft, moist, moderately to highly plastic, dark grey brown, obvious banding			
17								silty CLAY, firm to stiff, moist, moderately plastic, light grey green, occasional organic inclusions- tree bark and branches			
18			10 20 24	N = 44				silty SAND, stiff to very stiff, well packed, high density, green grey			
19											
20											

Core Boxes -
 Shear Vane -
 Factor (as per NZGS Guideline)
 Core will be stored for 3 months only unless alternative arrangements are made



PROJECT: Middlemore Station
 CLIENT: ARTNL
 LOCATION: Western platform Middlemore Station
 JOB No.: 51/20265/05
 LOGGED BY: SL
 CHECKED BY: TD
 COMMENCED: 14/11/05
 COMPLETED: 14/11/05

Borehole No.: BH 1

Page: 3 of 3

CONTRACTOR: Pro Drill
 EQUIPMENT: Small Kubota Tractor
 INCLINATION (deg): - DIAMETER (mm): -
 X-COORDINATE: - Y-COORDINATE: -
 R.L. SURFACE (m): - TOTAL DEPTH (m): 23m

Depth (m)	Geological Group	DESCRIPTION OF CORE Geological Formation: (name, weathering, relative strength, colour, cement, defect type, lithological features, bedding, foliation, mineralogy, etc)	SPT Blow Count	Test Result SPT 'N' Value Shear Strength (kPa)	Core Loss (%)	Spacing of Natural Defects (m)	Graphic Log	DEFFECT DESCRIPTION (defect type, attitude, spacing, continuity, roughness, infilling etc) SOIL DESCRIPTION (minor MAJOR subordinate, consistency, water content, plasticity/relative density, grading, etc)	Piezometer Details and Water Levels	Water Loss (%)	Drilling Method
21	Tauranga Group		7 10 10	N = 20				micaceous SAND with some silt and clay, firm to stiff, moist, very slightly plastic, medium density, dark grey green			Washdrilling
22										Washdrilling	
23				14 25 25 for 100mm	N = 50						SPT
23		End of Borehole @ 23m. Target Depth									

Core Boxes -
 Shear Vane -
 Factor (as per NZGS Guideline)
 Core will be stored for 3 months only unless alternative arrangements are made



RECORD OF BOREHOLE

Job Name : **Middlemore Station**

Client : **GHD**

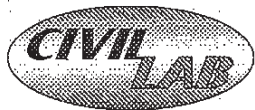
Date of Order : **23.7.04**

Location : **As per client's marks**

Borehole No. : **BH 3**

SHEAR STRENGTH (kPa)	REMOULDED STRENGTH (kPa)	SENSITIVITY	OTHER TESTS	DEPTH (m)	GRAPHIC LOG	SAMPLE DESCRIPTION	GROUNDWATER	CORE RECOVERY %	SAMPLE TYPE	MOISTURE CONTENT %	COMMENTS
				0.0		TOPSOIL					
216+	-			0.5		Firm to stiff, moderately plastic, orange/brown silty CLAY, moist					
183	90			1.0							
159	33			1.5		Firm to stiff, moderately plastic, orange/brown streaked yellow/brown clayey SILT and moist					
135	42			2.0							
96	30			2.5		- becoming firm, moderately plastic, yellow/brown flecked grey	▽				
27	21			3.0		- becoming soft and wet					
48	36			3.5		- becoming soft, highly plastic, dark grey/black clayey SILT and wet					
81	30			4.0							
39	30			4.5							
69	30			5.0							
				5.5		E.O.B. at 5.0 metres Scala carried out in base of borehole					

DRILLED BY: KH	SAMPLE TYPES	CHECKED BY: TB
DATE: 26.7.04	SS Small Sample	DATE: 29.07.04
LOGGED BY: ZH	LS Large Sample	
DATE: 26.7.04	SH Undisturbed Shelby Tube Sample	



DETERMINATION OF THE PENETRATION RESISTANCE OF A SOIL
NZS 4402 : 1988 TEST 6.5.2 - HAND METHOD USING A DYNAMIC CONE PENETROMETER
EQUIVALENT CBR VALUES TO CRB 402.1 - CRB AUSTRALIA
(Conversion to CBR values are not IANZ endorsed as part of this report)

Job Name: **Middlemore Station**
 Date of Order : 23.7.04
 Location : Base of borehole 3
 Layer Tested : -

DEPTH	NO. OF BLOWS	EQUIV. CBR	DEPTH	NO. OF BLOWS	EQUIV. CBR	DEPTH	NO. OF BLOWS	EQUIV. CBR	DEPTH	NO. OF BLOWS	EQUIV. CBR
Borehole 3											
5100	1	2									
5200	2	3.5									
5300	2	3.5									
5400	4	8									
5500	4	8									
5600	4	8									
5700	5	10									
5800	5	10									
5900	3	5.5									
6000	3	5.5									

Comments:

Tested By:	ZH and KH	Date:	26.7.04
Checked By:	TB	Date:	29.07.04
Approved Signatory:		Date:	29.07.04



ÄÄÄ! Ä "
#\$ %&'()Ä\$* !)+

KS=Z
<QZ. <E8 . <SQ

#\$ 15

89\$# ' >'P' 9
T%D\$?# .2 '%Ä) '(
T%D\$?#ÄH& C\$% M""++6+-

8 DD%() #G + "MMI+," N&Z 3-"N+", +3& Q
S %%(#) #D(\-"^ Z\$(@)#(-, M6&
=D?) #D(T)1) # D\$D\$
E\$) #H\$ OÄ ÄM577MB&

Ä 8 KQZÄ ORZPKS=ZÄSRÄ < KÄ8 TÄÄ SÄT=Z0ÄSRÄ . RTÄÄÄ . Z. RO. ÄÄ +47415

Table with multiple columns containing technical specifications, codes, and alphanumeric strings. Includes sections like 'RZS=SR<8 =Ä Z:8P< T. \$Q', 'P) 9: Ä)99G#', 'E'99', 'E(SÄÄ)'(\$Ä) 9ÄÄ&', and 'Ä 6- Ä#Ä() #Ä Ä#Ä& .) %ÄÄ81#2'. The table also features various patterns and symbols such as 'M', '3', 'N', '+', '6', 'MM453', '+1453', 'INMc', and 'Ä 6- Ä#Ä() #Ä Ä#Ä& .) %ÄÄ81#2'.

Hand Auger No. **HA01**
 Sheet 1 of 1
 Project No: **GENZAUCK16136AA**
 Date started: **13.12.2013**
 Date completed: **13.12.2013**
 Logged by: **PP**
 Checked by: **RF**

Engineering Log - Hand Auger

Client: **AUCKLAND COUNCIL**
 Principal:
 Project: **ROSELLA ROAD STORMWATER CULVERT UPGRADE**
 Hand Auger Location: **Refer to site plan**

VanE No: 1356 Easting: 406590.31 m Slope: -90° R.L. Surface: 8.71 m
 Hole diameter: 50 mm Northing: 790857.86 m Bearing: Datum:

drilling information				material substance													
stratigraphy	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	Material Description	moisture condition	consistency/density index	vane shear (remoulded /peak) kPa	structure and additional observations						
Fill	▼	13/12/2013	8.5	0.5	[diagonal hatching]		TOPSOIL	D	H								
							Clayey SILT; low plasticity, orange-brown, mottled dark brown, trace fine subangular gravel. Moist, hard, minor fine rootlets.	M									
							Silty CLAY; medium plasticity, dark brown, mottled dark brown/orange. Moist, very stiff - hard, trace fine rootlets.	VSt		>>X							
							buried TOPSOIL; medium plasticity, dark grey, flecked black/orange. Moist, very stiff to hard, with trace fine rootlets.		•	x							
							CH Silty CLAY; medium to high plasticity, light grey streaked orange. Moist, very stiff, trace fine rootlets.		•	x							
							1.4m: becoming high plasticity, wet										
							1.5m: minor organic staining		•x								
							1.8m: becoming saturated										
							PT PEAT; fibrous, spongy, dark brown, minor fine grained sand. Saturated, firm, organic odour, minor plant inclusions.	F	•	x							
							3.5m: becoming firm with some fibres compressed		•	x							
Tauranga Group Alluvium	▼	13/12/2013	6.5	2.0	[cross-hatching]			S		•	x						
			4.5	4.5	[cross-hatching]		CH	Sandy CLAY; grey, some silt. Saturated, very stiff.	VSt		•	x					
			4.0	5.0	[cross-hatching]												
			3.5	5.5	[cross-hatching]				D-Md		•	x					
			3.5				Borehole HA01 terminated at 5 metres.										

classification symbols and soil description based on Field Description of Soil and Rock, New Zealand Geotechnical Society Inc 2005	vane shear (kPa) ● remoulded x peak >>X peak greater than 200kPa UTP unable to penetrate	water ▼ 10/1/98 water level on date shown ▲ water inflow ◀ water outflow	moisture D dry M moist W wet S saturated	consistency/ density index VS very soft VL very loose S soft L loose F firm MD medium dense St stiff D dense VSt very stiff VD very dense H hard
---	---	--	---	---

HAND AUGER HA1-2 13122013.GPJ COFFEY.GDT 3.2.14
 Form GEO 5.1 Rev.6

Part 2 Gordon Road



Part 2 Station Road



Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH03)



DH03- 0.0 – 1.7m



DH03- 1.7 – 5.0m

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH03)



DH03- 5.0 – 8.0m



DH03- 8.0 - 11.0m

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH03)



DH03- 11.0 – 14.0m



DH03- 14.0 - 16.5m

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH03)



DH03- 16.5 - 18.0m



DH03- Site



ÄÄÄ! Ä "
#\$ %&'() Ä\$* !)+

KS=Z
<QZ. <E8 . <SQ

#\$ 41

89\$# ' >'P)' 9
T'D\$?# .2 '%Ä)' (
T'D\$?#ÄH& C\$% M""++6+-

8 DD%(') #G + "3M3-, -3&Z 3NN-66,71& Q
S %\$(#)#D(\- " ^ Z\$@)E(!N,3- &
=D?)#D(T)1)# D\$D\$
E\$)#H\$ OÄÄM",5B&

Table with multiple columns containing alphanumeric codes, symbols, and text. Includes a vertical label 'OP QR AR PSOT' on the left side of the table.

Ä 8KQZÄ ORZPKS=ZASRÄ < K08TÄ SÄT=Z0ÄSRÄ . RTÄÄÄ .Z. RO. ÄÄ+47415



Ä!Ä " Ä\$!% & Ä%

&C>^
=S'A?=<Q?=@A '# (

Q1+)([+!@-4
D*2) 4(?K+*Ä- +,
D*2) 4(Ä5! 0) * \$,;XX%X_

Q2aZ. +-()6 X;VÄU" %!^ VU_VV;XX! A
C*+)(- (+2 a; b ^ 13(- Ä; \$"!
>24-(Ä, D-P-(2)(2)
<- (5*) B2*. 2, ÄD*N

S/P(K	B^C>CB=Q >Ä^IQ@=D?=@A T)-(1) *90ÄZ3OÄ4*Ä@4Ä-1) OÄ1) 9(10 S642 (+5+16OÄ+2234.Ä) (5)6Ä0).+ 90Ä+(Ä. O 1+.) *12LOÄ4). (OÄZ	?) 6(Ä@42* 6 I K)*ÄR-.) ÄND-Z @6+5-1Ä0)-N Ä-ÄÄÄ Ä-ÄÄÄ	I- IP: 1+9	SL-! 4ÄQ2.) D.) (*2!) () * Y 12J6ÄP Ä; Ä Z S Ä ÄU X	E' ?^ @=>Ä^IQ@=D?=@A 1 502* +-()ÄE \C@Ä+ 2MÄ25MÄ545) Ä(1) 9(MÄ1265) Ä2. fe MÄÄ +9M 0) .. +9MÄ6(4+1UMÄ66+3LMAJ2ÄC4(Ä. Ä) 64*P+2MÄ62*+-()ÄG 4(Ä. J6 4*P(Ä. M +2*Ä-4(Ä. Ä)6 4*P(Ä. Ä)4 S/P(KÄ@ 1(). @! - *N6	B+PKÄÄ99	=6(5) , (- (+2.
Ä	<+11 E+F) Ä6, Ä -, Ä G)Ä9*+), Ä -1636! ÄUV:U ÄÄUW ÄÄU:V ÄÄU:XX	Ä Ä " " # # # \$ % \$	Ä Ä " " # # # \$ % \$	I =>Ä! (KÄ2!) Ä1LÄ, Ä! +2* Ä-, M Ä-*N0*2J, Ä-#! O ! 26(OÄJÄÄP 6(ÄÄL Q1L) LÄI=>MÄK(ÄL)ÄJÄ0*2J, Ä! (KÄ2- 9) Ä 2((16 ÄI(Ä ! 26(OÄÄ.) * -) 1ÄP 6(Ä I - . LÄ =>ÄJ(KÄ +2*Ä41LMÄK(Ä9) LÄ0*2J, ÄR*LÄ(Ä ! 26(OÄJÄÄP 6(ÄÄL I' ASÄJ(KÄÄ!) ÄÄ(MÄ*Ä9) L ÄÄK(LÄP4N). OÄ65- (). C*9- , #Ä1L) LÄI=>MÄ*Ä0*2J, ÄI(ÄÄ65- (). OÄ12 P46 (ÄÄL Ä 22.ÄPÄ) ÄÄ%Ä Ä)9(K & ÄÄ(! + - (). Ä(Ä#% / , -01)Ä2Ä.3-4) Ä5)Ä(2Ä75)8 +9	I =>Ä! (KÄ2!) Ä1LÄ, Ä! +2* Ä-, M Ä-*N0*2J, Ä-#! O ! 26(OÄJÄÄP 6(ÄÄL Q1L) LÄI=>MÄK(ÄL)ÄJÄ0*2J, Ä! (KÄ2- 9) Ä 2((16 ÄI(Ä ! 26(OÄÄ.) * -) 1ÄP 6(Ä I - . LÄ =>ÄJ(KÄ +2*Ä41LMÄK(Ä9) LÄ0*2J, ÄR*LÄ(Ä ! 26(OÄJÄÄP 6(ÄÄL I' ASÄJ(KÄÄ!) ÄÄ(MÄ*Ä9) L ÄÄK(LÄP4N). OÄ65- (). C*9- , #Ä1L) LÄI=>MÄ*Ä0*2J, ÄI(ÄÄ65- (). OÄ12 P46 (ÄÄL Ä 22.ÄPÄ) ÄÄ%Ä Ä)9(K & ÄÄ(! + - (). Ä(Ä#% / , -01)Ä2Ä.3-4) Ä5)Ä(2Ä75)8 +9	Ä	Ä
X	Ä! Ä#S%&'() Ä *Ä+, - . %Ä&/Ä . +! 0&() '+ 1Ä+""Ä2 Ä3""(			@! - *N6 >24-(Ä, Ä6*3) L). Ä0ÄQ > "" UÄD-Ä6ÄK) ÄK)* Ä,)ÄH †	I (- * (). ;Ä; ;" ;Ä" <+ 6K). ;Ä; ;" ;Ä" S- ()Ä299). ;Ä; ;" ;Ä" >299). ! > @ QK) 4N). @ B	Ä	Ä
	&- , . ÄQ1.ÄK)- * ÄR- ,) S@Ä U;ÄÄ !!Ä 01.) HÄQ**) 4+2Ä- 4(2*ÄÄ U#V 4&"Ä+3"Ä! Ä+15 (3ÄS"Ä68 9Ä5) /"%)				D-9) Ä 2G Ä		

Ä! Ä#S%&'() Ä *Ä+, - . %Ä&/Ä . +! 0&() '+ 1Ä+""Ä2 Ä3""(



Ä!Ä " Ä\$!% & Ä%

&C>^ =S'A?=<Q?=@A '# .

Q1+)([+!@-4
D*2) 4(?K+*Ä- +,
D*2) 4(Ä5! 0) * \$;XX%X_

Q2aZ. +-()6 X;V\$VÄ\$U! ^ VUU_%VÄ! A
C*+)(- (+2 a; b ^ 13(- 2, "Ä #X!
>24-(2, D-P-(2)(2)
<)-(5*) / EÄ\$; "ÄN

S/P(K	B^C>CB=Q >Ä^IQ@=D?=@A T.)-(K)*90ÄZ3OÄ4*Ä@ÄÄ-) OÄ! 9(KO S642 (+5+6Ä+2234.Ä*) (5)6Ä0).+ 902*(2.0 !+.)-12LOÄ4).(OÄZ	?)6(Ä@42*.6 I K)*ÄR.-) ÄND-Z @85-1Ä0)-N	- IP: 1+9	SL-! 4ÄQ2.) D.) (*2!) () * Y 12J6ÄP Ä! Z s Ä AU x	E' ?^ @=>Ä^IQ@=D?=@A 1 502* +-(ÄE \C@Ä+ 2MÄ25MÄ545) Ä!(*). 9(MÄÄ265) Ä2. +2. MÄÄ +9M 0) . +9MÄÄ(4+LUMÄ66+3LUMÄ12Ä24(2.Ä) 64*P+2MÄ62*+-(ÄG 4(2.)6 4*P(2. M +2*Ä 4(2.Ä)6 4*P(2.Ä)4 S/P(KÄ@ 1). @! - *N6	B-P-K-Ä99	=6(5) , (-+2.
Ä	<+11 Q2! P1() 1ÄJ)-(K*). Ä9 LÄ02J, 32# , #Ä5(Ä*)!) 1ÄJ)-N V_""	ÄU%*V			I =PMAÄJ, Ä#! Ä(Ä6ÄÄLOÄÄ) OÄ!, LÄ22(1)6OÄ62 9-3) ÄK+11Z I #LÄQ> eÄJÄÄ(Ä4) Ä*3) MÄK(Ä9) LÄ*2J, Ä (KÄK(ÄL)ÄJ 0*2J, Ä, .Ä*, 9) Ä 2((15 Ä(ÄÄ2-6(OÄJÄÄ 6(ÄL ÄÄ) Ä(2 !) +5! Ä*3) 1 Q1L) LÄI=ÄÄJÄÄ(Ä2) Ä9-3) MÄÄLÄ02J, Ä(ÄÄ)ÄIOÄ P16(ÄOÄ66(Ä) ÄE. 5! Ä(Ä2-6) Ä9-3) ÄÄG 4NÄ2# , #6 Y-6-(ZÄ, Ä (-4)Ä6, .Ä +45.+9Ä 56423(Ä) Ä9 4NÄ ÄE-L P4(Ä9!) (6\$! HÄ6L ; U! HÄ9*-)6Ä(2Ä3LÄ. .L Ä =?OÄ6*-). Ä! HÄRLÄ(ÄGÄÄ)Ä02J, Ä9)ÄOÄÄ(- OÄÄ(Ä*-4 42-6)Ä6, Ä(2ÄGÄ9*-3)1Ä6)Ä*25,.Ä3 2#.+4 1P+HÄ		
#					8* LÄ(J! +-.). Ä(ÄÄÄ / ,01)Ä(2Ä.3-.4)Ä 6Ä22Ä+G6Ä(Ä(Ä59)* &-*. Ä-1) *Ä(ÄÄÄ!Ä) P(KÄ2**) 6P2. 6Ä(ÄK*. Ä-1)*)4 25()*)Ä+Ä45(Ä2P)Ä! Ä25(KÄGÄ.-59)* ÄK2J S)64*0)Ä-6Ä%4 ÄL) ÄGÄ-N (Ä 2)* -(1LÄ)-(K*)O 42-6)Ä2# , #Ä/ <<Ä42 P*6). Ä25) Ä(Ä2-6) Ä6. 68). OÄ95+ OÄK(Ä9) LÄ02J, ÄÄ 4) 6Ä262*+ Ä/ .) *1 +Ä0 ";4 ! ÄL) ÄGÄ LÄJ)-N (Ä*) LÄ*2J, OÄ =?I ?CÄ^ ÄP*20-01L 0-N. Ä2# , #Ä.#G 1Ä(PK- ÄÄÄ) *L+9Ä6. .LÄI=ÄOÄÄL 0*2J, OÄÄÄ2-6(
X	Ä! Ä#S%&'&() Ä *Ä+.-. %Ä&/Ä .+! 0&() '+ 1Ä+""Ä2 Ä9""(			@! - *N6 >24-(2, Ä6*3) L). Ä0ÄQ> Ä ÄÄÄ-Ä6Ä(Ä6) -*Ä3,)Ä# †	I (-*). "Ä; ".":;Ä" <+ 6K). "Ä; ".":;Ä" S-()Ä299). "Ä; ".":;Ä" >299). @'B QK)4N). &&		D-9) Ä 2G Ä
	&- . .Ä(1.ÄK)-* ÄR-) S@X"U;+HÄÄ !Ä 01.)HÄQ** 4(+2Ä<- 4(2*ÄÄ #S\$V 4&"Ä+3*! Ä+15 (3ÄS"Ä68 9Ä5)/%"						

7 B^@&C>^ÄCBÄ DRC#; dÄ>CTÄQC/ A7IÄQCED=>SÄCB1 BDIÄ 1^ BS?ÄÄÄ#Ä

Part 3 12/14 Wyllie Road





139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 8019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 1 of 8

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 25/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 407703.86		Date Completed: 30/06/2010	
Diameter Core: HQ (60mm)		Northing: 788855.54		Inclination: 90°	
Flush: Water		Ground Level: 23.59m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
	23.5					Fill	F	0m: Clayey SILT with minor fine sand, dark brown. Soft, wet, high plasticity. Frequent rootlets. [TOPSOIL]. 0.1m: Silty GRAVEL, dark brown. Loose, wet. Angular, 10-30mm in size. Frequent rootlets. [FILL].	GM							0m: FILL Representative samples taken from hand auger cuttings.	
	23.0					Auckland Volcanic Field	VI	0.35m: Clayey SILT with some fine sand, mottled orange brown and light grey. Firm to stiff, wet, high plasticity. Frequent rootlets. (TUFF).	MH							0.35m: AUCKLAND VOLCANIC FIELD	
	22.5	1															
	22.0							1.5m: ...50mm band of medium SAND, orange brown. Medium dense, wet, non plastic. 1.55m: Fine sandy SILT, medium brown. Firm to stiff, wet, low plasticity.	ML					3/1,1,1,1	4		
	21.5	2						2.2m: ...increase in sand content, some fine gravels (<0.5mm). 2.25m: Sandy clayey SILT, banded orange brown and light grey. Firm to stiff, wet, low plasticity.									
	21.0							2.6m: Very clayey SILT, orange brown. Firm to stiff, wet, high plasticity. 2.7m: ...light brownish grey with discrete orange brown streaks and brown organic streaks.									
	20.5	3						3.3m: ...light to medium grey.						0/0,1,1,2	4		
	20.0																
	19.5	4															
	19.0					Paleosol	T	4.5m: Very clayey SILT, medium grey with dark brown organic staining. Very soft, wet, high plasticity.						1/0,0,0,0	0	4.5m: PALEOSOL	
	18.5						ATI	4.7m: Very clayey SILT, light to medium grey with dark brown organic staining. Very soft, wet, high plasticity. minor medium to coarse white pumiceous sand. [TAURANGA GROUP].								4.7m: TAURANGA GROUP	

Remarks:														Logged: HH	
1. Hand Auger to 1.2mbgl for service check.														Input: HH	
2. Casing to 24.0mbgl.														Checked: PKC	
3. No groundwater measured on the day of drilling.														Verified: AJB	
4. Hole backfilled with gravel and bentonite.															

Last Generated: 12/07/2010 2:10:29 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 2 of 8

DRILLING INFORMATION Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear		CO-ORDINATES [ME2000] Easting: 407703.86 Northing: 788855.54 Ground Level: 23.59m [Auckland 1946 msl]		Date Started: 25/06/2010 Date Completed: 30/06/2010 Inclination: 90° Orientation:	
---	--	--	--	--	--

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	18.5							4.7m: Very clayey SILT, light to medium grey with dark brown organic staining. Very soft, wet, high plasticity. minor medium to coarse white pumiceous sand. [TAURANGA GROUP].		67						4.95m: Core loss likely between 4.95 to 5.3m.	
HQ3	18.0	6				ATI		5.8m: ...medium to dark brown (organic stained). Some thin interbeds (<30mm) of PEAT, black. Very soft, wet. Amorphous.	MH							6m: Attempted push tube - sample slipped out.	
HQ3	17.5	7						7.2m: ...100mm band of fine sandy SILT, light grey with dark brown organic staining. Firm, wet, low plasticity.		100							
SPT	17.0					Tauranga Group		7.35m: Organic clayey SILT/ PEAT, black. Very soft, wet, high plasticity. Plastic, amorphous and discrete wood fragments.					2/1,2,2,2	7			
HQ3	16.5																
SPT	16.0	8				ATd			OH							8.41m: Core loss likely between 8.41 to 9.0m.	
HQ3	15.5																
SPT	15.0																
HQ3	14.5	9															
SPT	14.0																
HQ3	14.0								CH							9m: Zero SPT values resulting from hammer weight.	
	10					ATc				100							

Last Generated: 12/07/2010 2:10:30 p.m.

Remarks:

1. Hand Auger to 1.2mbgl for service check.
2. Casing to 24.0mbgl.
3. No groundwater measured on the day of drilling.
4. Hole backfilled with gravel and bentonite.

Logged: HH
Input: HH
Checked: PKC
Verified: AJB



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 3 of 8

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 25/06/2010
Drilling Method: Truck Mounted Drill Rig		Easting: 407703.86		Date Completed: 30/06/2010
Diameter Core: HQ (60mm)		Northing: 788855.54		Inclination: 90°
Flush: Water		Ground Level: 23.59m		Orientation:
Contractor: Boart Longyear		[Auckland 1946 msl]		

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details	
														Peak/Residual 'Su' or Blows	'N' Value			
HQ3	13.5					Tauranga Group	ATc	9.75m: CLAY with some silt, light to medium brownish grey. Very soft, wet, high plasticity. Frequent dark brown amorphous organic streaks.	CH	100							10.5m: Attempted push tube -sample slipped out.	
	13.0			ATI			10.4m: Clayey SILT with trace fine sand, medium grey. Soft, wet, high plasticity. Discrete dark brown organic fragments.	MH										
	11						ML	10.65m: Fine sandy SILT, light to medium grey. Soft to firm, wet, low plasticity. Some mica specks. Some greyish green lenses and discrete dark brown organic fragments.										
	12.5								11.05m: Silty fine SAND with trace clay, medium grey. Medium dense, wet, low plasticity. Some mica specks.									
	12.0						ATs	11.15m: to 11.35m... brown (organic stained) with discrete black organic streaks.	SM	100								
	11.5								12m: PEAT, black. Firm to stiff, wet. Amorphous and fibrous.	PT	100		5/4,8,8,8	29				
	11.0								12.3m: Silty fine SAND, medium grey. Medium dense, wet, non plastic. Some mica specks.									
	10.5								12.45m: ...very loose.									
	10.0								13.5m: ...trace clay.						3/0,0,0,2	2		
	9.5								13.9m: Clayey SILT with trace fine sand, medium grey. Firm, wet, high plasticity. Some mica specks. Discrete sandy lenses.	MH	90							
9.0																		
							ATs	14.6m: Fine SAND, medium grey. Loose, wet, non plastic. Some mica specks. Discrete lenses of CLAY, medium grey. Soft, wet, high plasticity. Trace siltstone gravels, firm, rounded (<15mm).	SW	90								

Remarks:		Logged:	HH
1. Hand Auger to 1.2mbgl for service check.		Input:	HH
2. Casing to 24.0mbgl.		Checked:	PKC
3. No groundwater measured on the day of drilling.		Verified:	AJB
4. Hole backfilled with gravel and bentonite.			

Last Generated: 12/07/2010 2:10:30 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 4 of 8

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 25/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 407703.86		Date Completed: 30/06/2010	
Diameter Core: HQ (60mm)		Northing: 788855.54		Inclination: 90°	
Flush: Water		Ground Level: 23.59m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
SPT	8.5					ATs		14.6m: Fine SAND, medium grey. Loose, wet, non plastic. Some mica specks. Discrete lenses of CLAY, medium grey. Soft, wet, high plasticity. Trace siltstone gravels, firm, rounded (<15mm).	SW					2/1,0,1,2	4		
HQ3	8.0					ATI		15.45m: Clayey SILT with some fine sand, medium grey. Firm, wet, low plasticity. Some mica specks.	ML								
HQ3	7.5							15.88m: Clayey SILT with some fine sand, medium grey. Soft to firm, wet, high plasticity. Some mica specks and discrete sandy lenses.		95							
HQ3	7.0							16.3m: Sandy clayey SILT, medium grey. Soft, wet, high plasticity. Some mica specks.	MH					1/0,0,1,2	3		
SPT	6.5					Tauranga Group		16.8m: Silty SAND with some clay, medium grey. Very loose, wet, low plasticity. Some mica specks.	SM								
HQ3	6.0							17.45m: Fine to medium SAND, medium grey. Loose, wet, non plastic. Some mica specks.		90							
SPT	5.5					ATs		18m: ...medium dense.						2/1,3,5,8	17		
HQ3	5.0							18.45m: Drillers Note change to normal catcher. Attempted core run - material washed out.	SW								
HQ3	4.5							19.5m: ...very dense.						10/12,14,19,5	64	19.5m: SPT - 50 blows for 235mm.	
SPT	4.0																
SPT	20																

Remarks:		Logged: HH
1. Hand Auger to 1.2mbgl for service check.		Input: HH
2. Casing to 24.0mbgl.		Checked: PKC
3. No groundwater measured on the day of drilling.		Verified: AJB
4. Hole backfilled with gravel and bentonite.		

Last Generated: 12/07/2010 2:10:30 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 5 of 8

DRILLING INFORMATION Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear		CO-ORDINATES [ME2000] Easting: 407703.86 Northing: 788855.54 Ground Level: 23.59m [Auckland 1946 msl]		Date Started: 25/06/2010 Date Completed: 30/06/2010 Inclination: 90° Orientation:	
---	--	--	--	--	--

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	3.5							17.45m: Fine to medium SAND, medium grey. Loose, wet, non plastic. Some mica specks.		100						19.885m: <i>Drillers Note</i> change to extended catcher. Add quick mud.	
HQ3	3.0									0						20.5m: <i>Drillers Note</i> change to normal catcher. Material washed out.	
SPT	2.5	21						21m: ...dense.					12/7,9,12,14	42			
HQ3	2.0									100						21.45m: <i>Drillers Note</i> change bit to a clay coring bit. Applying 800psi to core material.	
HQ3	1.5	22								47							
HQ3	1.0							22.5m: ...very dense.	SW	67							
SPT	1.0									100						22.5m: SPT - 50 blows for 175mm.	
HQ3	0.5	23								53						22.825m: <i>Drillers Note</i> add quick mud.	
HQ3	0.0									56						23.2m: <i>Drillers Note</i> add quick mud.	
HQ3	0.0									56							
SPT	-0.5	24						24m: ...dense.		67							
HQ3	-1.0									8						24.45m: <i>Drillers Note</i> change bit and ream casing to 16.0mbgl.	

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. Casing to 24.0mbgl. 3. No groundwater measured on the day of drilling. 4. Hole backfilled with gravel and bentonite.														Logged: HH Input: HH Checked: PKC Verified: AJB	
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Last Generated: 12/07/2010 2:10:30 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 6 of 8

DRILLING INFORMATION	CO-ORDINATES [ME2000]	Date Started: 25/06/2010 Date Completed: 30/06/2010
Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear	Easting: 407703.86 Northing: 788855.54 Ground Level: 23.59m [Auckland 1946 msl]	Inclination: 90° Orientation:

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	-1.5						ATs	17.45m: Fine to medium SAND, medium grey. Loose, wet, non plastic. Some mica specks.	SW	8							
SPT	-2.0						ATc	25.42m: CLAY/ organic CLAY, medium to dark brown (organic staining). Soft, wet, high plasticity. Some mica specks.	CH	100			0/2,1,3,2	8	25.5m: Zero SPT values resulting from hammer weight.		
HQ3	-2.6							25.95m: ...some silt and fine sand. 25.98m: to 26.02m... some dark brown fibrous organic fragments.									
HQ3	-3.0						ATs	26.18m: Silty fine SAND with some clay, light greenish grey. Medium dense, wet, low plasticity. Some mica specks and discrete black organic specks.	SM	90			5/4,5,6,7	22	27.45m: Core loss likely from 27.45 to 27.8m.		
SPT	-3.5									100							
HQ3	-4.0						ATI	27.85m: Clayey SILT with some fine sand, light greyish brown. Firm, wet, low plasticity. Some dark brown amorphous organic flecks. 28.05m: ...medium greyish brown (organic staining).	ML	67							
HQ3	-4.5						ATs	28.1m: Fine SAND with some silt, medium grey. Dense, wet, non plastic. Some mica specks.	SW	100			7/7,8,10,12	37			
SPT	-5.0									100							
HQ3	-5.5						ATs		SW	92							
HQ3	-6.0																

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. Casing to 24.0mbgl. 3. No groundwater measured on the day of drilling. 4. Hole backfilled with gravel and bentonite.	Logged: HH Input: HH Checked: PKC Verified: A.JB
---	---

Last Generated: 12/07/2010 2:10:30 p.m.



Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 7 of 8

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 25/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 407703.86		Date Completed: 30/06/2010	
Diameter Core: HQ (60mm)		Northing: 788855.54		Inclination: 90°	
Flush: Water		Ground Level: 23.59m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
SPT	-6.5							28.1m: Fine SAND with some silt, medium grey. Dense, wet, non plastic. Some mica specks.	SW	100				8/6,9,10,13	38		
HQ3	-7.0															30.45m: Core loss likely from 30.45 to 31.48m. <i>Drillers Note</i> inner stuck down hole.	
SPT	-7.5	31												6/7,6,8,8	29		
HQ3	-8.0							33m: ...dense.	SW	100						31.95m: Core loss likely from 31.95 to 32.98m.	
SPT	-8.5	32															
HQ3	-9.0																
SPT	-9.5	33												6/3,4,6,5	18		
HQ3	-10.0							33.45m: PEAT, dark brown to black. Firm to stiff, wet, non plastic. Amorphous, fibrous and some wood fragments.	PT							33.45m: <i>Drillers Note</i> change bit and ream casing to 24.0mbgl.	
SPT	-10.5	34						33.89m: Inferred boundary. Fine SAND, medium greenish grey. Dense, wet, non plastic. Some mica specks.	SW	42						33.89m: Core loss likely from 33.89 to 34.5m.	
HQ3	-11.0													8/9,11,12,16	48		
SPT	-11.5	35						34.6m: Silty fine SAND with trace clay, light greenish grey. Dense, wet, low plasticity to non plastic. Some mica specks.	SM	100							

Remarks:

- Hand Auger to 1.2mbgl for service check.
- Casing to 24.0mbgl.
- No groundwater measured on the day of drilling.
- Hole backfilled with gravel and bentonite.

Logged: HH
Input: HH
Checked: PKC
Verified: AJB

Last Generated: 12/07/2010 2:10:30 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **St George St Church, Papatoetoe**
Project Reference: **203299**

DH101

Sheet 8 of 8

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 25/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 407703.86		Date Completed: 30/06/2010	
Diameter Core: HQ (60mm)		Northing: 788855.54		Inclination: 90°	
Flush: Water		Ground Level: 23.59m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details	
														Peak/Residual 'Su' or Blows	'N' Value			
HQ3	-11.5					Tauranga Group	ATs	34.6m: Silty fine SAND with trace clay, light greenish grey. Dense, wet, low plasticity to non plastic. Some mica specks.	SM							34.95m: Core loss likely from 34.95 to 35.5m.		
	-12.0							35.5m: Inferred boundary. Medium SAND, medium grey. Very dense, wet, non plastic. Some mica specks.		38								
SPT	-12.5	36												3/3,11,22,21	63	35.9m: Core loss likely from 35.9 to 36.0m. 36m: SPT - 57 blows for 270mm.		
HQ3	-13.0							36.5m: ...30mm band of silty CLAY, grey. Very stiff, wet, high plasticity. 36.58m: ...10mm band of silty CLAY, grey. Very stiff, wet, high plasticity.									36.62m: Core loss likely from 36.62 to 37.5m.	
	-13.5	37																
SPT	-14.0	38						37.5m: ...medium dense.	SW						5/4,6,8,5	23		
	-14.5							37.95m: ...some lenses of silty CLAY (<5mm).										
HQ3	-15.0							38.2m: ...discrete shell inprints.										
	-15.5	39						38.85m: ...5mm lens of medium brown fibrous organics. 39m: ...dense.							5/5,8,11,15	39		
SPT								DH101 terminated at 39.45m depth - Target Depth.										

Remarks:														Logged: HH	
1. Hand Auger to 1.2mbgl for service check.														Input: HH	
2. Casing to 24.0mbgl.														Checked: PKC	
3. No groundwater measured on the day of drilling.														Verified: AJB	
4. Hole backfilled with gravel and bentonite.															

Last Generated: 12/07/2010 2:10:30 p.m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH101 Date Drilled: 25/06/10 - 30/06/10
Photographed By: HH Date Photographed: 25/06/10 - 30/06/10



Box 1. - Depth: 0.00m to 4.50m.



Box 2. - Depth: 4.50m to 8.35m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH101 Date Drilled: 25/06/10 - 30/06/10
Photographed By: HH Date Photographed: 25/06/10 - 30/06/10



Box 3. - Depth: 8.35m to 12.45m.



Box 4. - Depth: 12.45m to 15.95m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH101
Photographed By: HH

Date Drilled: 25/06/10 - 30/06/10
Date Photographed: 25/06/10 - 30/06/10



Box 5. - Depth: 15.95m to 20.25m.



Box 6. - Depth: 20.25m to 25.95m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference:	DH101	Date Drilled:	25/06/10 - 30/06/10
Photographed By:	HH	Date Photographed:	25/06/10 - 30/06/10



Box 7. - Depth: 25.95m to 29.50m.



Box 8. - Depth: 29.50m to 36.00m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH101 Date Drilled: 25/06/10 - 30/06/10
Photographed By: HH Date Photographed: 25/06/10 - 30/06/10



Box 9. - Depth: 36.0m to 39.45m.



+ FBMC , MB?EF
8>DASC 5KE@X? EN
8>DASCANV#LA> %((:!: \$

+D'D@PQB:(ÄÄ.% "J# 4 ÄJÄ]: !# .
1>ENOCEN ^\$ _ 4FAU?EN ! (%
-DSXEN 8?R?CACA
3A?CWA * X Ä%("IT#

741-172 +) - /4<+62 852].	5ABCÄSD@			EERLJK AGD@ +7EENJÄH?7TB	/ARCK	7>?RKUSÄJ	X) 5462) -Ä 4<+62 852]. <VLD@PQÄ) d16# ED@D EMBGSDAÄGANI@G# DEBÄSDN@EN@?@ECLA@G@P#EBCO BÄBEHE@ ?DÄP?SEN@ABEEN@MLD@EQA#?SDN@ES@E@N@ EDÄP#SE@N@ABEEN@G#
XEA@ÄMUE#SD# R#EEN ABS?>EJÄEM#RÄN@ÄMFTA@ EINE L-ÄÄRDEB 5) *6 J) 7) Ä7 61* 8 1.7 Ä 12-Ä3Ä6(ÄG)X)2. Ä1-ÄÄÄ1 X8-24/ Ä-17 < 7 8ÄÄ) <4 7 /5 ÄÄ'-Ä(Ä'	<KA?>Ä0?NA >ÄE@VÄRA?T (ÄÄ)Ä 78?	Ä0?FVÄB (ÄÄ)	"S&'! "Q"Q"Ä.Z %.&I :Q"Q"Ä.Z]:&'("Q"Q"Ä.Z ""&'! "Q"Q"Ä.Z "(&"] "Q"Q"Ä.Z I&'S :Q"Q"Ä.Z IS&% "Q"Q"Ä.Z Ä.el (	1; <85 1; <85 1; <85 1; <85 1; <85	/" /" /" /" /" /" /" /" /Ä /] /5	3EÄÄÄS?>BÄÄ / ANÄÄ#EDÄEÖÄE#ÄO@TÄJAG -DDEAQÄBEÖQÄSÄBASTBÄÄ#ÄBSEÖEÄ ""# =Ä?CV>?CA@ +PQÄÄ 2-5ÄNÄÄCSÄÄEÄBÄNÄNÄ#ÄBSEÖEÄBASTEQ J>AGÄ-ÖRÄÄBEÖQÄSÄBASTBÄÄ#ÄBSEÖEÄ "!# =Ä?@ÄBÖDÄ@E# Ä@ÄMB 3EÄÄÄS?>BÄÄ / ANÄÄ#EDÄEÖÄE#ÄO@TÄJAG -DDEAQÄBEÖQÄSÄBASTBÄÄ#ÄBSEÖEÄ ": IÄCDÄ"Ä# =ÄÄED>ÄLSTÄD>J?SEÖ>ÄBÄÄRÄ?TB +PQÄÄ 2-5ÄNÄÄCSÄÄEÄBÄNÄNÄ#ÄBSEÖEÄBASTEQ J>AGÄ-ÖRÄÄBEÖQÄSÄBASTBÄÄ#ÄBSEÖEÄ 3EÄÄÄS?>BÄÄ / ANÄÄ#EDÄEÖÄE#ÄO@TÄJAG -DDEAQÄBEÖQÄSÄBASTBÄÄ#ÄBSEÖEÄ "% IÄÖÄ"Ä# =ÄÄÄRÄSTÄD>J?SEÖÄÄ?TB "J# =Ä?@ÄBÖDÄ@E# Ä@ÄMB "J IÄCDÄ"Ä# =ÄÄMÄDNÄE?TBQÄ@ÄC?NÄ "\$ I# =Ä?@ÄBÖDÄ@E# Ä@ÄMB / W ÄÄÄE?CÄÄCÄ#Ä5>JACÄÄRCK	2NÖC>VÄNÖEDN

7 61* J])546Ä 1;<460)52 1.< / ARK 8EÄD# ÄÄ 6Ä?@E /? Ä	/ ?ÄÄJJA@ "%&' & ("" - DJJA@ .7 +KASTA@ 6; 7 +?EENJÄ AÖEFB / ARK / E# ÄÄ	6Ä# ?>B -DS?ÖINÄB-UAGÄ@IGÄ+ - ""Ä T8?ÄEÄÄÄKÄ?ÄPNAFEIE W?NÄKÄ@ÄKÄ?Ä?NÄ 7 41 " : " = Ä"\$#ÄLP@ÄÄD>ÄSENÄ?SD>ÄÄÄ [Ä] Ä!"Ä#\$"%Ä&% &SÄ("ÄÄ, Ä-/0."	/ >E FFA <Ö>Ä@ 8>D Y> EF "%&' & ("" / >E FFA 3EÄÄKÄ@ , VLDÖ "%&' & ("" +DÄÄ D YÄB 8?JÄ ' DP '
---	--	--	--

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH02)



DH02- 0.0 - 3.5m



DH02- 3.5 - 6.8m

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH02)



DH02- 6.8 - 10.0m



DH02- 10.0 - 13.3m

Kiwi Rail Ltd
Third Main – Puhinui Station to Otahuhu Station
Drillhole Photos (DH02)



DH02- 13.3 – 16.5m



DH02- 16.5 – 19.95m



ÄÄÄ! Ä "
#\$ %&' () Ä\$* !)+

KS=Z
<OZQ. <E8 . <SQ

#\$, 2

89\$# ' >'P' 9
T%D\$?# .2 '%Ä) '(
T%D\$?#ÄH& C\$% M""++6+-

8DD%(') #G + "33+, 3N&Z 3NNMNM& Q
S %\$(#)#D(\- " ^ Z\$(@)#E(!3, N+&
=D?)#D(T)1)#D\$D\$
E\$)#H\$ OÄÄ6-, N77B&

Ä 8 K-QÄ ORZPKS=ZÄSRÄ, < KÄ8 TÄSÄT=Z0ÄSRÄ, RTÄÄÄ, Z, RO, ÄÄ+47415

Table with multiple columns containing alphanumeric codes, symbols, and text. Includes headers like 'RZS=SR<8 =Ä Z:8P< T. <SQ' and various symbols like 'E'99', 'N74!', 'M455', 'M346!', 'M4M3'. The table is organized into several vertical sections with varying background patterns.



ÄÄÄ! Ä "
#\$ %&' () Ä\$* !)+

KS=Z
<QZ. <E8 . <SQ # \$, 4

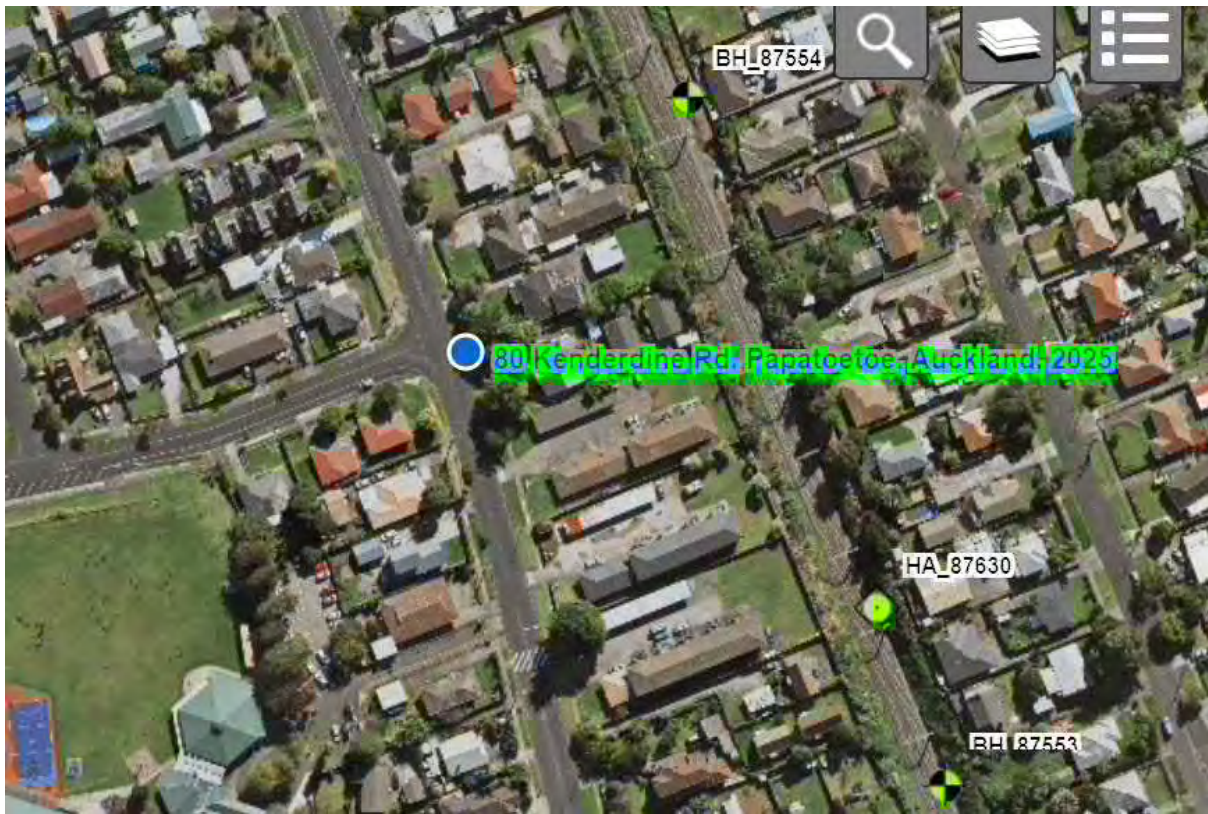
89\$ # ` '>'P' 9
T'D\$?# .2 '%Ä) '(
T'D\$?#ÄH& C\$% M'''++6+-

8DD%(') #G + "33N", -N&Z 3NN357+3&Q
S%#(#D(\- " ^ Z\$@)E(!N, +6&
=D?)#D(T)1)#D\$D\$
E\$)#H\$ OÄÄ6-, N-IB&

Ä 8 K-QÄ ORZPKS=ZÄSRÄ < KÄ8 TÄSÄT=Z0ÄSRÄ . RTÄÄÄ . Z. RO. ÄÄ+47415

Table with multiple columns containing alphanumeric codes, symbols, and technical specifications. Includes headers like 'RZS=SR<8 =Ä Z:8P< T. \$Q' and various alphanumeric strings.

Part 4 Kenderdine Road



Part 4 Bridge Street





139 Carleton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **10 Bridge St, Papatoetoe**
Project Reference: **203299**

DH105

Sheet 1 of 6

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 10/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408087.05		Date Completed: 11/06/2010	
Diameter Core: HQ (60mm)		Northing: 787971.39		Inclination: 90°	
Flush: Water		Ground Level: 23.84m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 ms]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details			
														Peak/Residual 'Su' or Blows	'N' Value					
HA	23.5					Fill	F	0m: Silty GRAVEL, dark grey and brown. Medium dense, moist. Poorly sorted, angular to subangular, medium sized. [FILL].	GP-GM								0m: FILL Representative samples taken from hand auger cuttings.			
									0.3m: Clayey SILT, brown. Very stiff, moist, high plasticity. Some angular gravels.											
							Auckland Volcanic Field	Vt	0.6m: Clayey SILT with some fine sand, dark orange brown and brown. Firm to stiff, wet, high plasticity. [TUFF].	MH								0.6m: AUCKLAND VOLCANIC FIELD		
							Paleosol	T	1.75m: Inferred boundary. Very clayey SILT, dark brown. Firm to stiff, moist, high plasticity. [PALEOSOL].										1.75m: PALEOSOL	
							Tauranga Group	ATc	2.05m: Silty CLAY, light grey with some orange mottling and brown interbeds. Firm to stiff, moist, high plasticity. Trace white pumiceous specks. [TAURANGA GROUP].							1/1,1,2,2	6	2.05m: TAURANGA GROUP		
						3m: ...orange brown.												3m: Attempted push tube - sample slipped out.		
							3.15m: ...dark brown with some very light brown interbeds.													
							3.5m: ...dark brown (organic stained).													
							3.6m: SILT, light grey. Stiff, moist, low plasticity.													
							3.75m: Silty fine SAND, light greyish brown. Loose, wet, non plastic.													
							4.03m: PEAT, dark brown to black. Stiff, wet. Amorphous and fibrous.													
							4.85m: ...band of wood at base of push tube.													

Remarks:														Logged: HH	
1. Hand Auger to 1.2mbgl for service check.														Input: HH	
2. No groundwater measured on the day of drilling.														Checked: PKC	
3. Hole backfilled with gravel and bentonite.														Verified: AJB	

Last Generated: 12/07/2010 2:11:11 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **10 Bridge St, Papatoetoe**
Project Reference: **203299**

DH105

Sheet 2 of 6

DRILLING INFORMATION				CO-ORDINATES [ME2000]				Date Started: 10/06/2010 Date Completed: 11/06/2010									
Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear				Easting: 408087.05 Northing: 787971.39 Ground Level: 23.84m [Auckland 1946 msl]				Inclination: 90° Orientation:									
Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
SPT	18.5					ATp	ATp	4.03m: PEAT, dark brown to black. Stiff, wet. Amorphous and fibrous.	PT					0/2,4,4,4	14	5m: SPT reading possibly affected by wood fragments from previous push tube.	
HQ3	18.0					ATs	ATs	5.2m: Silty fine SAND, light brownish grey. Medium dense, moist, non plastic. Dilatent when wet.	SM	70	100			1/0,0,0,0	0	5.45m: Attempted push tube -sample slipped out. <i>Drillers Note</i> change to extended catcher. Returned core is very disturbed.	
								5.75m: ...light brown and saturated (drilling induced).									
SPT	17.5					ATp	ATp	6.08m: PEAT, dark brown to black. Very soft, wet. Amorphous.	PT	100	100					6.45m: Core loss likely from 6.45 to 6.9m.	
HQ3	17.0							6.45m: ...firm.									
TW	16.5					ATp	ATp	7.28m: ...two thin (<10mm) bands of silty CLAY, medium brown. Firm, moist, high plasticity.	PT	57	83						
HQ3	16.0																
SPT	15.5					ATc	ATc	9.3m: CLAY, light grey. Firm, wet, high plasticity.	CH	104	100						
HQ3	15.0																
SPT	14.5					ATs	ATs	9.7m: Gradational boundary. Silty CLAY with some fine sand, light grey with some black specks. Firm, wet, high plasticity.	SM	100				2/1,2,2,2	7		
HQ3	14.0																
	10																

Remarks:
1. Hand Auger to 1.2mbgl for service check.
2. No groundwater measured on the day of drilling.
3. Hole backfilled with gravel and bentonite.

Logged: HH
Input: HH
Checked: PKC
Verified: AJB



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **10 Bridge St, Papatoetoe**
Project Reference: **203299**

DH105

Sheet 3 of 6

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 10/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408087.05		Date Completed: 11/06/2010	
Diameter Core: HQ (60mm)		Northing: 787971.39		Inclination: 90°	
Flush: Water		Ground Level: 23.84m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	13.5							9.85m: Silty fine SAND with trace clay, grey. Medium dense, wet, non plastic.		100				2/1,3,3,4	11		
SPT	13.0	11						10.5m: Silty fine SAND, medium grey. Medium dense, wet, low plasticity. Discrete black specks and some mica specks.		44							
HQ3	12.5							11.1m: ...10mm band of clayey SILT, medium grey. Firm, wet, high plasticity.		100				3/2,3,3,4	12	12m: SPT sample slipped out.	
SPT	11.5							12.45m: ...discrete brown organic flecks.	SM	0						12.5m: Drillers Note loss of circulation.	
HQ3	11.0									86							
SPT	10.5									100				5/4,2,1,1	8		
HQ3	10.0							13.95m: ...some thin interbeds of clayey SILT with some fine sand, medium grey. Soft, wet, high plasticity.		100							
SPT	9.5																
HQ3	9.0																
SPT	8.5																

Remarks: 1. Hand Auger to 1,2mbgl for service check. 2. No groundwater measured on the day of drilling. 3. Hole backfilled with gravel and bentonite.													Logged:	HH
													Input:	HH
													Checked:	PKC
													Verified:	AJB

Last Generated: 12/07/2010 2:11:11 p.m.



Client: **ONTRACK**
 Project: **Auckland Electrification Project**
 Location: **10 Bridge St, Papatoetoe**
 Project Reference: **203299**

DH105

Sheet 4 of 6

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 10/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408087.05		Date Completed: 11/06/2010	
Diameter Core: HQ (60mm)		Northing: 787971.39		Inclination: 90°	
Flush: Water		Ground Level: 23.84m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details	
														Peak/Residual 'Su' or Blows	'N' Value			
SPT	8.5	8.5					ATs	10.5m: Silty fine SAND, medium grey. Medium dense, wet, low plasticity. Discrete black specks and some mica specks. 15m: to 15.6m... dilatent.	SM	100				2/2,2,3,4	11	15.45m: Core loss likely from 15.45 to 15.9m.		
HQ3	8.0	16					ATs		SM	48				1/0,0,0,0	0	16.5m: SPT reading possibly affected by previous core run.		
SPT	7.5	7.0					ATc	16.5m: Gradational boundary. Silty fine SAND, medium grey with some dark grey bands. Very loose, wet, non plastic. Some mica specks.		100							16.95m: Core loss likely from 16.95 to 17.2m.	
HQ3	7.0	17					ATc	16.95m: Silty CLAY with trace fine sand, medium grey with some brown organic staining. Soft to firm, wet, high plasticity. Some thin bands of amorphous organics (<2mm). Some mica specks.	CH	76								
SPT	6.5	18					ATs	17.5m: Silty fine SAND with some clay, medium grey. Medium dense, wet, low plasticity. Some thin bands of amorphous organics (<2mm). Some mica specks. 17.75m: Fine SAND with some silt, medium grey. Medium dense, wet, non plastic. Some mica specks. 17.8m: ...3mm band of brown amorphous organics with some mica specks.	SM	100				2/0,0,1,2	3			
HQ3	6.0	19					ATs	18.4m: Silty fine SAND, medium grey with dark grey bands and some brown organic staining. Medium dense, wet, non plastic. Some interbeds of silty CLAY (20-30mm), medium grey. Soft to firm, wet, high plasticity. Discrete thin brown amorphous organic bands (<2mm). 19m: ...decrease in organics and silty CLAY interbeds.	SM	86								
SPT	5.5	20					ATs	19.5m: Fine SAND with some silt, medium grey. Medium dense, wet, non plastic. Some mica specks.	SW	100				2/0,2,1,1	4			

Remarks:														Logged: HH	
1. Hand Auger to 1.2m bgl for service check.														Input: HH	
2. No groundwater measured on the day of drilling.														Checked: PKC	
3. Hole backfilled with gravel and bentonite.														Verified: AJB	

Last Generated: 12/07/2010 2:11:12 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **10 Bridge St, Papatoetoe**
Project Reference: **203299**

DH105

Sheet 5 of 6

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 10/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408087.05		Date Completed: 11/06/2010	
Diameter Core: HQ (60mm)		Northing: 787971.39		Inclination: 90°	
Flush: Water		Ground Level: 23.84m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details	
														Peak/Residual 'Su' or Blows	'N' Value			
HQ3	3.5							19.5m: Fine SAND with some silt, medium grey. Medium dense, wet, non plastic. Some mica specks.										
SPT		21					ATs	21m: ...very dense.	SW	44			10/10,11,14,15	50				
HQ3	2.0							21.45m: ...wet to saturated (drilling induced).										
SPT		22						22.5m: Very clayey SILT with minor fine sand, medium to dark brownish grey. Firm to stiff, moist to wet, high plasticity. Discrete black organic flecks and some mica specks.					1/1,1,3,3	8			21.45m: Drillers Note SPT rods stuck down hole - add drilling mud. Applying 1000psi with extended catcher - change to normal catcher - material washed out.	
HQ3	0.5							23.02m: Very clayey SILT with trace fine sand, light blueish grey. Stiff, wet, high plasticity.										22.95m: Drillers Note change to extended catcher.
SPT		23					ATI	24.4m: Fine sandy SILT, light blueish grey. Medium dense, wet, low plasticity to non plastic. Some white specks/ fine gravels (<1mm). Some thin interbeds of clayey SILT, light blueish grey. Stiff, wet, high plasticity. Some mica specks.	MH	100								
HQ3	0.0							24.8m: to 25.1m... loose.	ML	100								
HQ3	-1.0																	

Remarks:		Logged:	HH
1. Hand Auger to 1.2mbgl for service check.		Input:	HH
2. No groundwater measured on the day of drilling.		Checked:	PKC
3. Hole backfilled with gravel and bentonite.		Verified:	AJB

Last Generated: 12/07/2010 2:11:12 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **10 Bridge St, Papatoetoe**
Project Reference: **203299**

DH105

Sheet 6 of 6

DRILLING INFORMATION Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear		CO-ORDINATES [ME2000] Easting: 408087.05 Northing: 787971.39 Ground Level: 23.84m [Auckland 1946 msl]		Date Started: 10/06/2010 Date Completed: 11/06/2010 Inclination: 90° Orientation:	
---	--	--	--	--	--

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
SPT	HQ3	1.5				Tauranga Group	ATI	24.4m: Fine sandy SILT, light blueish grey. Medium dense, wet, low plasticity to non plastic. Some white specks/ fine gravels (<1mm). Some thin interbeds of clayey SILT, light blueish grey. Stiff, wet, high plasticity. Some mica specks.	ML	100				4/4,5,8,10	27		
		2.0						DH105 terminated at 25.95m depth - Target Depth.									

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. No groundwater measured on the day of drilling. 3. Hole backfilled with gravel and bentonite.														Logged: HH Input: HH Checked: PKC Verified: AJB	
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Last Generated: 12/07/2010 2:11:12 p.m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH105 Date Drilled: 10/06/10 – 11/06/10
Photographed By: HH Date Photographed: 10/06/10 – 11/06/10



Box 1. - Depth: 0.00m to 5.20m.



Box 2. - Depth: 5.20m to 8.60m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH105 Date Drilled: 10/06/10 – 11/06/10
Photographed By: HH Date Photographed: 10/06/10 – 11/06/10



Box 3. - Depth: 8.60m to 11.90m.



Box 4. - Depth: 11.90m to 15.45m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH105

Date Drilled: 10/06/10 – 11/06/10

Photographed By: HH

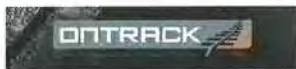
Date Photographed: 10/06/10 – 11/06/10



Box 5. - Depth: 15.45m to 19.50m.



Box 6. - Depth: 19.50m to 23.60m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH105

Date Drilled: 10/06/10 – 11/06/10

Photographed By: HH

Date Photographed: 10/06/10 – 11/06/10



Box 7. - Depth: 23.60m to 25.95m.



Babbage Geotechnical Laboratory
 Level 4
 68 Beach Road
 Auckland 1010
 Telephone
 Fax
 Email

P O Box 2027
 New Zealand
 64-9-367 4954
 64-9-377 0554
wec@babbage.co.nz

Please reply to: W.E. Campton

Page 1 of 5

Aurecon Ltd
 PO Box 9762
 Newmarket
 Auckland 1149, New Zealand



Job Number: 44326

Checked by:
 WEC
 9th July 2010

Attention: **PAUL CARTER**

Dear Sir,

**Re: AEP Bridges
 Hydrometer Particle-Size Distribution Testing
 Report Number: 44326/HYD**

The following report presents the results of hydrometer particle-size distribution testing of core box soil samples collected from your office on the 7th July 2010. Test results are summarised below, with the following pages showing graphs and detailed results.

Test standards used were:

Water Content: NZS4402:1986:Test 2.1
Hydrometer Test: NZS4402:1986:Test 2.8.4

Borehole Number	Sample Number	Depth (m)	Hydrometer Grading (% of Dry Mass)		
			SAND (%)	SILT FRACTION (%)	CLAY FRACTION (%)
DH102	1	14.0 – 14.1	69	19	12
DH105	2	14.9 – 15.0	59	27	14
DH106	3	16.25 – 16.35	70	18	12
DH106	4	11.6 – 11.7	53	32	15

The whole soil was used for these tests.

Please note that the test results relate only to the samples under test.


Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report, please contact the undersigned at your convenience.

Yours faithfully,

Wayne Campton
**Signatory (Laboratory Manager)
 Babbage Geotechnical Laboratory**



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

 B G L BABBAGE GEOTECHNICAL LABORATORY	Job Number:	44326	Sheet 1 of 1	Page 3 of 5
	Reg. Number:	1787	Revision No:	1
	Report No:		Issue Date:	August 2003
	Project:	AEP Bridges		

PARTICLE SIZE DETERMINATION

Distribution by Hydrometer
 Test Method: NZS4402:1986:Test 2.8.4

Tested By:	wec	Jul-10
Compiled By:	comp	Jul-10
Checked By:	wec	9/07/2010

Borehole Number: DH105
Sample Number: 2
Depth: 14.9 - 15.0m

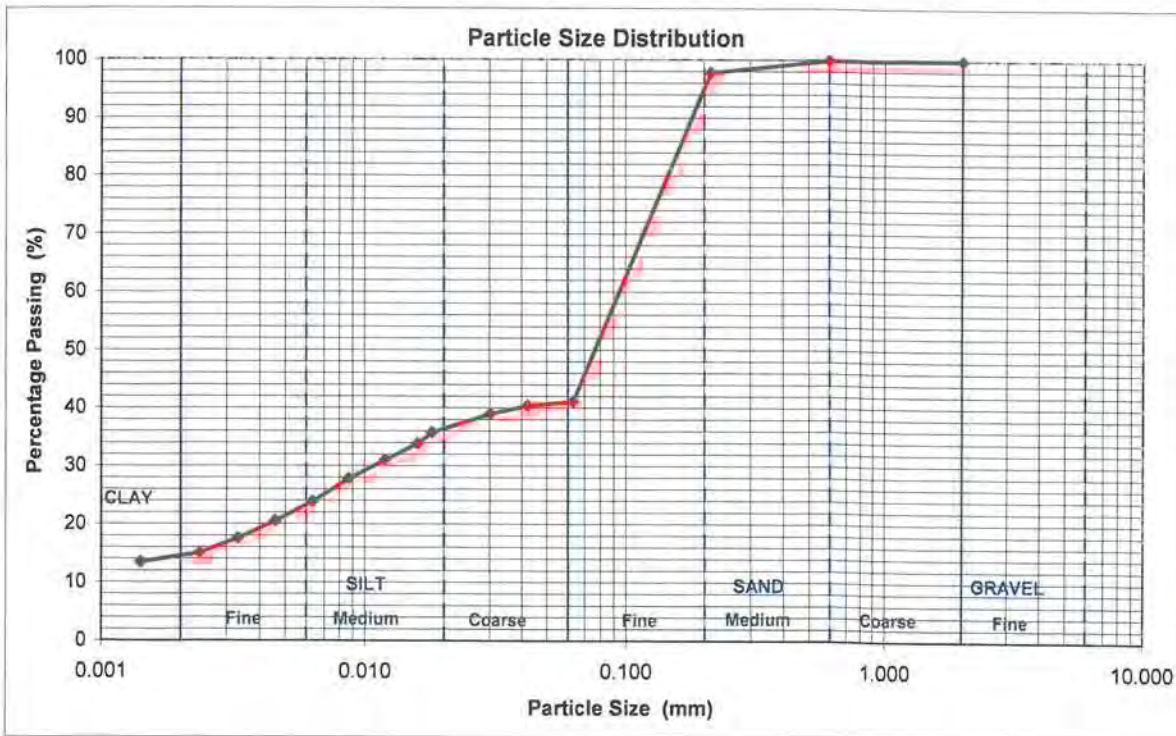
Water Content (%): 34.3

Sample History: Natural / Air-Dried / Oven-Dried / Unknown

Particle Size (mm)	% Finer Than
9.50	100
6.70	100
4.75	100
2.00	100
0.600	100
0.212	98
0.063	41
0.042	40
0.030	39
0.018	36
0.016	34
0.012	31
0.0087	28
0.0063	24
0.0046	21
0.0033	18
0.0024	15
0.0014	13

HYDROMETER ANALYSIS (% of dry mass)

			Total	
GRAVEL:	(Coarse)	60 - 20mm	0	0 %
	(Medium)	20 - 2mm	0	
	(Fine)	6 - 2mm	0	
SAND:	(Coarse)	2.0 - 0.6mm	0	59 %
	(Medium)	0.6 - 0.2mm	2	
	(Fine)	0.2 - 0.06mm	57	
SILT FRACTION:	(Coarse)	0.06 - 0.02mm	4	27 %
	(Medium)	0.02 - 0.006mm	14	
	(Fine)	0.006 - 0.002mm	9	
CLAY FRACTION: < 0.002mm			14	%
			100%	





139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

Sheet 1 of 7

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 17/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408097.37		Date Completed: 21/06/2010	
Diameter Core: HQ (60mm)		Northing: 787953.97		Inclination: 90°	
Flush: Water		Ground Level: 22.90m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HA	22.5	1				Auckland Volcanic Field	VI	0m: Clayey SILT with some trace fine sand, medium orange brown. Firm to stiff, wet, high plasticity. Some rootlets at top. [TUFF].	MH	50				1/1,1,1,2	5	0m: TUFF Representative samples taken from hand auger cuttings.	
HQ3	21.5	2				Auckland Volcanic Field Paleosol	T	1.5m: ...light orange brown.	MH	100						1.95m: Core loss likely between 1.95 to 2.45m.	
SPT	21.0					Auckland Volcanic Field Paleosol	VI	2.45m: Clayey SILT with some trace fine sand, medium to dark brown. Firm to stiff, wet, high plasticity. Some rootlets at top. [PALEOSOL].	CH	52						2.45m: PALEOSOL	
HQ3	20.5					Auckland Volcanic Field Paleosol	VI	2.55m: CLAY with some silt, light grey with discrete orange streaks. Firm to stiff, wet, high plasticity. Some white pumiceous gravels (<1mm), [TUFF]	CH							2.55m: TUFF	
SPT	20.0					Auckland Volcanic Field Paleosol	VI	3m: Clayey SILT with trace medium sand, medium grey. Firm to stiff, wet, low plasticity. Frequent compressed pumice fragments, light grey. Firm to stiff, wet, high plasticity.	CH	67				2/2,3,3,2	10		
HQ3	19.5					Tauranga Group	ATI	3.45m: SILT with some fine sand, light greyish brown. Stiff, wet, low plasticity to non plastic. [TAURANGA GROUP].	ML							3.45m: TAURANGA GROUP	
HQ3	19.0					Tauranga Group	ATI	3.55m: ...10mm band of CLAY, dark brown (organic stained). Stiff, wet, high plasticity.	ML	100							
HQ3	18.5					Tauranga Group	ATI	3.65m: ...20mm band of dilatent SILT.	ML								
HQ3	18.0					Tauranga Group	ATI	3.85m: ...medium greyish brown.	ML								
HQ3	18.0					Tauranga Group	ATI	3.95m: ...dark brown (organic stained).	ML								
HQ3	18.5					Tauranga Group	ATO	4.3m: Organic silty CLAY with trace fine sand, dark brown. Very soft, saturated, high plasticity. Discrete black amorphous organic pockets.	OH	90						4.5m: Attempted push tube - sample slipped out.	
HQ3	18.0					Tauranga Group	ATI	4.75m: Fine sandy SILT with some clay, medium orange brown. Soft becoming firm, wet, low plasticity.	ML	90							

Remarks:														Logged:		HH	
1. Hand Auger to 1.2m bgl for service check.														Input:		HH	
2. No groundwater measured on the day of drilling.														Checked:		PKC	
3. Hole backfilled with gravel and bentonite.														Verified:		AJB	

Last Generated: 12/07/2010 2:11:23 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

Sheet 2 of 7

DRILLING INFORMATION				CO-ORDINATES [ME2000]				Date Started: 17/06/2010 Date Completed: 21/06/2010									
Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear				Easting: 408097.37 Northing: 787953.97 Ground Level: 22.90m [Auckland 1946 msl]				Inclination: 90° Orientation:									
Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	17.5							4.95m: PEAT, black. Firm to stiff, wet, high plasticity. Amorphous and plastic with some brown fibrous wood fragments.	PT	90				1/0,1,1,1	3		
SPT	17.0	6					ATp										
HQ3	16.5																
HQ3	16.0	7															
TW	15.5																
TW54	15.0	8															
HQ3	14.5							8m: CLAY, light brownish grey. Firm, moist, high plasticity. Some dark brown amorphous organic flecks.	CH	105							
HQ3	14.0							8.65m: Fine sandy SILT with some clay, medium brownish grey. Firm, wet, low plasticity. Discrete fibrous wood/ rootlet streaks. Frequent mica specks.	ML								
SPT	13.5	9						9m: Gradational boundary. Silty fine SAND, medium grey. Very loose, wet, non plastic.	SM	100				1/2,2,1,2	7		
HQ3	13.0									76							
HQ3	10																9.45m: Core loss likely between 9.45 to 9.7m.

Last Generated: 12/07/2010 2:11:23 p.m.

- Remarks:**
1. Hand Auger to 1.2mbgl for service check.
 2. No groundwater measured on the day of drilling.
 3. Hole backfilled with gravel and bentonite.

Logged: HH
Input: HH
Checked: PKC
Verified: AJB



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

Sheet 3 of 7

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 17/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408097.37		Date Completed: 21/06/2010	
Diameter Core: HQ (60mm)		Northing: 787953.97		Inclination: 90°	
Flush: Water		Ground Level: 22.90m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 ms]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	12.5							9m: Gradational boundary. Silty fine SAND, medium grey. Very loose, wet, non plastic.		76				4/3,4,6,5	18		
SPT	12.0	11						10.5m: ...medium dense.		100						10.95m: Core loss likely between 10.95 to 11.3m.	
HQ3	11.5							11.6m: to 12.45m... dilatent.		67				6/4,4,4,3	15		
SPT	11.0	12								100						12.45m: Drillers Note change to normal catcher - no recovery. Change to extended catcher - material has washed out. Add drilling mud.	
HQ3	10.0	13								0				2/2,2,3,3	10		
SPT	9.5	14								100							
HQ3	8.5	15								46							

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. No groundwater measured on the day of drilling. 3. Hole backfilled with gravel and bentonite.													Logged:	HH
													Input:	HH
													Checked:	PKC
													Verified:	AJB

Last Generated: 12/07/2010 2:11:23 p.m.



Client: **ONTRACK**
 Project: **Auckland Electrification Project**
 Location: **9 Bridge St, Papatoetoe**
 Project Reference: **203299**

DH106

Sheet 4 of 7

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 17/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408097.37		Date Completed: 21/06/2010	
Diameter Core: HQ (60mm)		Northing: 787953.97		Inclination: 90°	
Flush: Water		Ground Level: 22.90m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 ms]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details						
														Peak/Residual 'Su' or Blows	'N' Value								
SPT	7.5	7.0	TW54	16	[Graphic Log]	Tauranga Group	ATs	15m: ...very loose.	SM						1/0,0,0,2	2							
							ATI	15.15m: Clayey SILT with trace fine sand, medium grey. Very soft, wet, high plasticity. Some mica specks.	MH														
							ATs	16.12m: Fine SAND with some silt, medium grey. Loose, wet to saturated, non plastic. Some mica specks.	SW						1/0,1,1,2	4							
							ATI	16.9m: Fine sandy SILT with some clay, medium grey. Soft, wet, low plasticity. Some mica specks. Some thin (<5mm) SAND interbeds.	ML											16.95m: Core loss likely between 16.95 to 17.25m			
							ATI	17.2m: ...5mm band of amorphous organic flecks.															
							ATI	17.55m: ...50mm band of amorphous organic flecks.															
							ATs	17.9m: Silty fine SAND, medium grey. Loose, wet, non plastic. Some mica flecks.	SM											0/2,2,2,2	8		18.45m: Core loss likely between 18.45 to 19.0m.
							ATs	19.5m: ...very dense.	SM											14/11,12,15,12	56		19.5m: SPT - 50 blows for 270mm.
							ATs																
							ATs																

Remarks:													Logged: HH		Input: HH	
1. Hand Auger to 1.2mbgl for service check.													Checked: PKC		Verified: AJB	
2. No groundwater measured on the day of drilling.																
3. Hole backfilled with gravel and bentonite.																

Last Generated: 12/07/2010 2:11:24 p.m.



Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

Sheet 5 of 7

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 17/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408097.37		Date Completed: 21/06/2010	
Diameter Core: HQ (60mm)		Northing: 787953.97		Inclination: 90°	
Flush: Water		Ground Level: 22.90m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 ms]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	RQD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	2.5	21				ATs		17.9m: Silty fine SAND, medium grey. Loose, wet, non plastic. Some mica flecks.	SM	10				5/5,7,7	24	19.92m: <i>Drillers Note</i> change to normal catcher - material has washed out.	
SPT								21m: ...medium dense.									
HQ3	1.0	22				ATc		21.65m: CLAY, dark brown (organic stained). Very stiff, wet, high plasticity. Some mica specks.	CH								21.45m: <i>Drillers Note</i> change to extended catcher -drilling is not advancing - change back to normal catcher Core loss likely between 21.45 to 21.65m.
SPT								21.98m: Clayey SILT with minor fine sand, light to medium grey. Very stiff, moist, high plasticity. Frequent white pumiceous gravels (<1mm). Some mica specks and discrete brown amorphous organic streaks.	MH	81							
SPT								22.4m: ...decrease in gravels. 22.5m: ...increase in sand content.						4/2,3,4,4	13		
HQ3	-0.5	23				ATI		22.95m: Fine SAND with some silt, medium grey. Medium dense, wet, non plastic. Some mica flecks. Some thin (<5mm) lenses of CLAY, medium grey. Firm, moist, high plasticity.	SW	100							
SPT								23.9m: Silty fine SAND, medium grey. Medium dense, moist to wet, low plasticity to non plastic. Some mica specks.	SM	100					3/4,5,4,5	18	
HQ3	-2.0	25				ATs		24.7m: Medium SAND, green. Dense, wet, non plastic. Some very light brown fragments (calcareous?).	SW	33							24.8m: Core loss likely between 24.8 to 25.5m.

Last Generated: 12/07/2010 2:11:24 p.m.

Remarks:		Logged:	HH
1. Hand Auger to 1.2m bgl for service check.		Input:	HH
2. No groundwater measured on the day of drilling.		Checked:	PKC
3. Hole backfilled with gravel and bentonite.		Verified:	AJB



139 Carleton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

Sheet 6 of 7

DRILLING INFORMATION		CO-ORDINATES [ME2000]		Date Started: 17/06/2010	
Drilling Method: Truck Mounted Drill Rig		Easting: 408097.37		Date Completed: 21/06/2010	
Diameter Core: HQ (60mm)		Northing: 787953.97		Inclination: 90°	
Flush: Water		Ground Level: 22.90m		Orientation:	
Contractor: Boart Longyear		[Auckland 1946 msl]			

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details
														Peak/Residual 'Su' or Blows	'N' Value		
HQ3	-2.5					ATs		24.7m: Medium SAND, green. Dense, wet, non plastic. Some very light brown fragments (calcareous?).	SW	33				13/13,11,9,9	42		
SPT	-3.0	26				ATc		25.95m: Silty CLAY/ organic silty CLAY, medium greyish brown with organic staining. Very stiff, wet, high plasticity. Frequent brown and black amorphous and fibrous organic fragments.	CH	100				6/5,8,10,11	34	25.95m: Drillers Note change to normal catcher.	
HQ3	-3.5					ATI		26.6m: ...80mm band of wood fragments. 26.75m: ...100mm band of PEAT, black. Firm, wet. Amorphous and fibrous. 26.85m: ...becomes light brownish grey with dark brown organic fragments/ veins. 27m: ...frequent bands (30-80mm) of wood.	MH	100							
SPT	-4.5	27				ATs		27.45m: ...decrease in wood. Trace fine gravels (<0.5mm). 27.5m: Very clayey SILT, medium grey. Very stiff to hard, moist, high plasticity. Discrete brown amorphous organic fragments. Some lenses (<20mm) of silty fine SAND, medium grey. Dense, moist, non plastic. 27.51m: ...discrete silty CLAY lithologic gravels, subrounded to rounded (1-5mm), greyish green. Very stiff, moist, high plasticity.	SM	100							
HQ3	-5.0	28				ATs		28.25m: Silty fine SAND, light to medium grey. Dense, moist to wet, non plastic.	SM	100				8/7,8,8,13	36		
SPT	-6.0	29				ATp		29.15m: ...10mm band of very clayey SILT. 29.17m: ...20mm band of very clayey SILT. 29.4m: ...35mm band of very clayey SILT. 29.45m: Medium SAND with some fine gravels and minor silt, dark grey. Dense, wet, non plastic. 29.5m: PEAT/ WOOD, medium orange brown to dark brown. Stiff, moist to wet. Fibrous and amorphous.	PT	100							

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. No groundwater measured on the day of drilling. 3. Hole backfilled with gravel and bentonite.													Logged:	HH
													Input:	HH
													Checked:	PKC
													Verified:	AJB

Last Generated: 12/07/2010 2:11:24 p.m.



139 Carlton Gore Road
PO Box 9762
Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **ONTRACK**
Project: **Auckland Electrification Project**
Location: **9 Bridge St, Papatoetoe**
Project Reference: **203299**

DH106

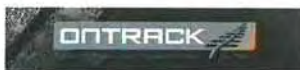
Sheet 7 of 7

DRILLING INFORMATION Drilling Method: Truck Mounted Drill Rig Diameter Core: HQ (60mm) Flush: Water Contractor: Boart Longyear		CO-ORDINATES [ME2000] Easting: 408097.37 Northing: 787953.97 Ground Level: 22.90m [Auckland 1946 msl]		Date Started: 17/06/2010 Date Completed: 21/06/2010 Inclination: 90° Orientation:
---	--	--	--	--

Drilling Method	R.L. (m)	Depth (m)	Sample Type	Water Level (m)	Graphic Log	Geological Name	Layer Code	Description of Materials	Weathering/USCS	TCR (%)	SCR (%)	ROD (%)	Fracture Index	Standard Penetration Tests [SPT]		Additional Information (Defect Description)	Installation Details						
														Peak/Residual 'Su' or Blows	'N' Value								
SPT		-7.5				Tauranga Group	ATp	30.2m: Silty medium SAND, light grey. Dense, wet, non plastic. Frequent fine white pumiceous gravels (<1mm).	PT	100					7/7,7,9,9	32							
							ATs	30.42m: PEAT/ WOOD, dark brown. Firm to stiff, wet. Fibrous and amorphous.	PT														
							ATI	30.55m: Clayey SILT, light greyish brown. Very stiff to hard, moist, high plasticity. Discrete black and dark orange brown amorphous organic fragments. 30.65m: ...becomes light to medium grey.	MH														
							ATs	31.05m: Gradational boundary. Silty fine SAND, medium grey. Dense, wet, non plastic.	SM	100										2/8,11,13,16	48	31.5m: Drillers Note SPT rods stuck down hole - need to drill over them.	
							ATs	31.95m: ...decrease in silt.	SM													31.95m: Core loss likely throughout run - material is worn down (drilling induced).	
SPT		-10.0				Tauranga Group	ATs	32.3m: ...wood fragment, dark brown (<10mm). 32.37m: ...wood fragment, dark orange brown (<10mm).	SM	38													
							ATs	DH106 terminated at 33.45m depth - Hole terminated due to equipment failure.							5/5,8,14,16	43							

Remarks: 1. Hand Auger to 1.2mbgl for service check. 2. No groundwater measured on the day of drilling. 3. Hole backfilled with gravel and bentonite.														Logged: HH Input: HH Checked: PKC Verified: AJB	
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Last Generated: 12/07/2010 2:11:24 p.m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



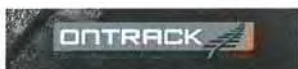
DH Reference: DH106 Date Drilled: 17/06/10 – 21/06/10
Photographed By: HH Date Photographed: 17/06/10 – 21/06/10



Box 1. - Depth: 0.00m to 4.15m.



Box 2. - Depth: 4.15m to 7.20m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH106

Date Drilled: 17/06/10 – 21/06/10

Photographed By: HH

Date Photographed: 17/06/10 – 21/06/10



Box 3 - Depth: 7.20m to 10.40m.



Box 4 - Depth: 10.40m to 15.45m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference:	DH106	Date Drilled:	17/06/10 – 21/06/10
Photographed By:	HH	Date Photographed:	17/06/10 – 21/06/10



Box 5. - Depth: 15.45m to 19.70m.



Box 6. - Depth: 19.70m to 23.80m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



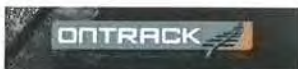
DH Reference: DH106 Date Drilled: 17/06/10 – 21/06/10
Photographed By: HH Date Photographed: 17/06/10 – 21/06/10



Box 7. - Depth: 23.80m to 27.45m.



Box 8. - Depth: 27.45m to 30.55m.



Auckland Electrification Project
St George St and Bridge St, Papatoetoe



DH Reference: DH106

Date Drilled: 17/06/10 – 21/06/10

Photographed By: HH

Date Photographed: 17/06/10 – 21/06/10



Box 9. - Depth: 30.55m to 33.45m.



Babbage Geotechnical Laboratory
 Level 4
 68 Beach Road
 Auckland 1010
 Telephone
 Fax
 Email

P O Box 2027
 New Zealand
 64-9-367 4954
 64-9-377 0554
wec@babbage.co.nz

Please reply to: W.E. Campton

Page 1 of 5

Aurecon Ltd
 PO Box 9762
 Newmarket
 Auckland 1149, New Zealand



Job Number: 44326

Checked by:
 WEC
 9th July 2010

Attention: **PAUL CARTER**

Dear Sir,

**Re: AEP Bridges
 Hydrometer Particle-Size Distribution Testing
 Report Number: 44326/HYD**

The following report presents the results of hydrometer particle-size distribution testing of core box soil samples collected from your office on the 7th July 2010. Test results are summarised below, with the following pages showing graphs and detailed results.

Test standards used were:

Water Content: NZS4402:1986:Test 2.1
Hydrometer Test: NZS4402:1986:Test 2.8.4

Borehole Number	Sample Number	Depth (m)	Hydrometer Grading (% of Dry Mass)		
			SAND (%)	SILT FRACTION (%)	CLAY FRACTION (%)
DH102	1	14.0 – 14.1	69	19	12
DH105	2	14.9 – 15.0	59	27	14
DH106	3	16.25 – 16.35	70	18	12
DH106	4	11.6 – 11.7	53	32	15

The whole soil was used for these tests.

Please note that the test results relate only to the samples under test.


Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report, please contact the undersigned at your convenience.

Yours faithfully,

Wayne Campton
**Signatory (Laboratory Manager)
 Babbage Geotechnical Laboratory**



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

 <p>B G L BABBAGE GEOTECHNICAL LABORATORY</p>	Job Number:	44326	Sheet 1 of 1	Page 4 of 5
	Reg. Number:	1787	Revision No:	1
	Report No:		Issue Date:	August 2003
	Project:	AEP Bridges		

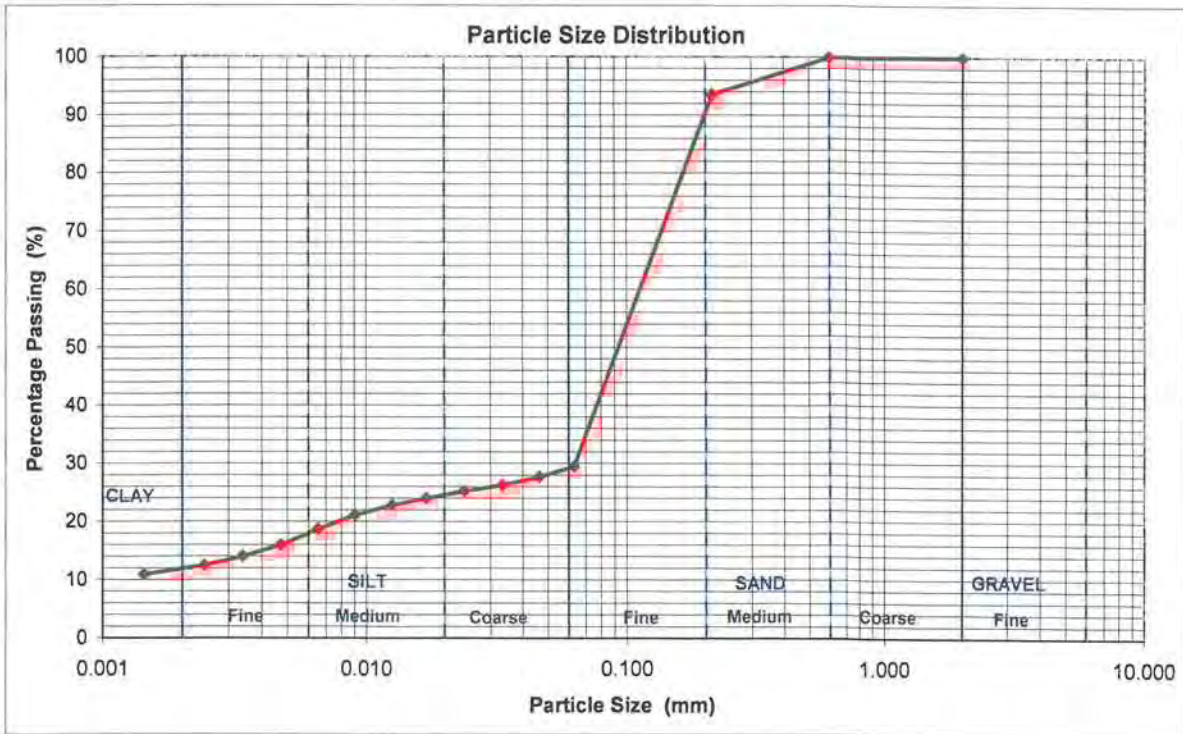
PARTICLE SIZE DETERMINATION Distribution by Hydrometer Test Method: NZS4402:1986:Test 2.8.4	Tested By:	wec	Jul-10
	Compiled By:	comp	Jul-10
	Checked By:	wec	9/07/2010


Borehole Number: DH106
Sample Number: 3
Depth: 16.25 - 16.35m
Water Content (%): 25.5

Sample History: Natural / Air-Dried / Oven-Dried / Unknown

Particle Size (mm)	% Finer Than
9.50	100
6.70	100
4.75	100
2.00	100
0.600	100
0.212	94
0.063	30
0.046	28
0.033	26
0.024	25
0.017	24
0.013	23
0.0091	21
0.0066	19
0.0047	16
0.0034	14
0.0024	12
0.0014	11

HYDROMETER ANALYSIS (% of dry mass)			Total	
GRAVEL:	(Coarse) 60 - 20mm	0	0	%
	(Medium) 20 - 2mm	0		
	(Fine) 6 - 2mm	0		
SAND:	(Coarse) 2.0 - 0.6mm	0	70	%
	(Medium) 0.6 - 0.2mm	6		
	(Fine) 0.2 - 0.06mm	64		
SILT FRACTION:	(Coarse) 0.06 - 0.02mm	5	18	%
	(Medium) 0.02 - 0.006mm	7		
	(Fine) 0.006 - 0.002mm	6		
CLAY FRACTION:	< 0.002mm		12	%
			100%	



 B G L BABBAGE GEOTECHNICAL LABORATORY	Job Number:	44326	Sheet 1 of 1	Page 5 of 5
	Reg. Number:	1787	Revision No:	1
	Report No:		Issue Date:	August 2003
	Project:	AEP Bridges		

PARTICLE SIZE DETERMINATION

Distribution by Hydrometer
 Test Method: NZS4402:1986:Test 2.8.4

Tested By:	wec	Jul-10
Compiled By:	comp	Jul-10
Checked By:	wec	9/07/2010

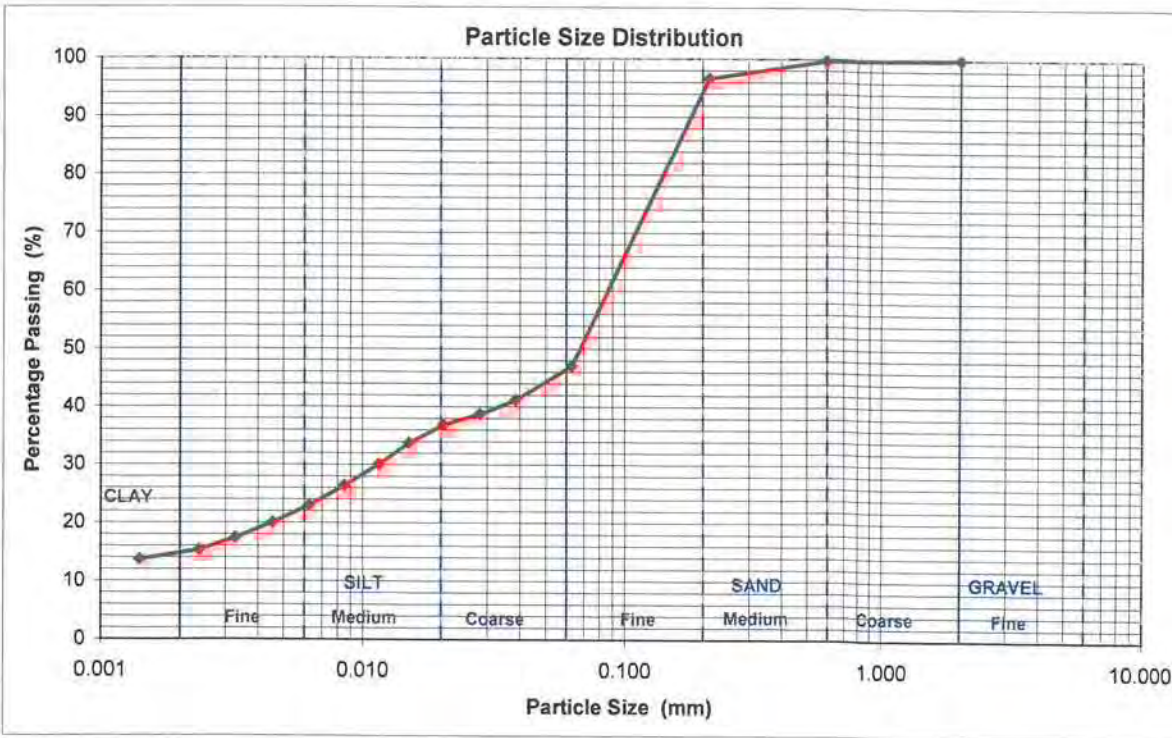
Borehole Number: DH106
Sample Number: 4
Depth: 11.6 - 11.7m
Water Content (%): 46.9

Sample History: Natural / Air-Dried / Oven-Dried / Unknown

Particle Size (mm)	% Finer Than
9.50	100
6.70	100
4.75	100
2.00	100
0.600	100
0.212	97
0.063	47
0.038	41
0.028	39
0.020	37
0.015	34
0.012	30
0.0085	26
0.0062	23
0.0045	20
0.0033	17
0.0024	15
0.0014	14

HYDROMETER ANALYSIS (% of dry mass)

				Total	
GRAVEL:	(Coarse)	60 - 20mm	0	0	%
	(Medium)	20 - 2mm	0		
	(Fine)	6 - 2mm	0		
SAND:	(Coarse)	2.0 - 0.6mm	0	53	%
	(Medium)	0.6 - 0.2mm	3		
	(Fine)	0.2 - 0.06mm	50		
SILT FRACTION:	(Coarse)	0.06 - 0.02mm	10	32	%
	(Medium)	0.02 - 0.006mm	14		
	(Fine)	0.006 - 0.002mm	8		
CLAY FRACTION: < 0.002mm				15	%
				100%	



Appendix E. Hazardous Activities and Industries List (HAIL)

KIWIRAIL

MIDDLEMORE (662,600m) TO PUHINUI (659,000m)

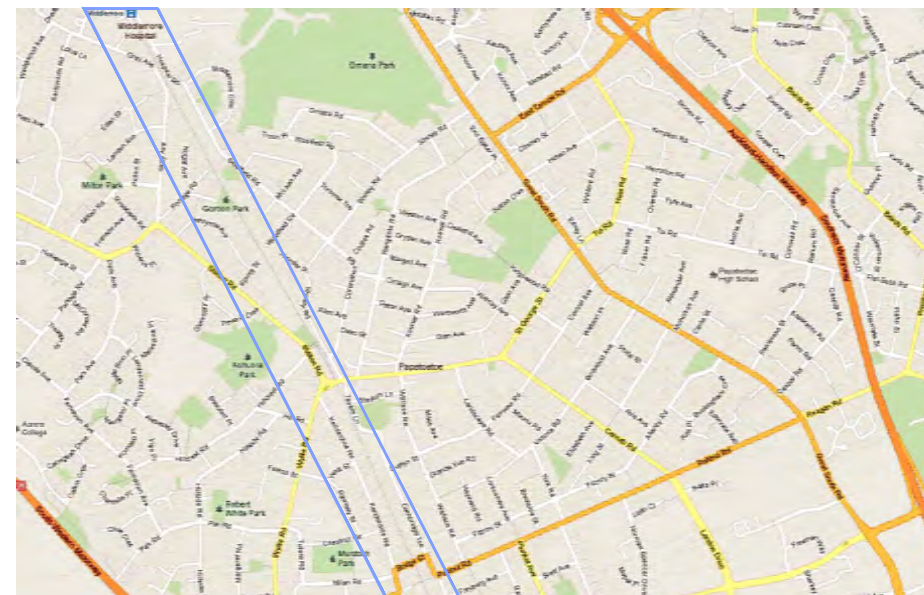
NEW THIRD MAIN - STAGE 2 CIVIL DRAWINGS

85% DETAILED DESIGN

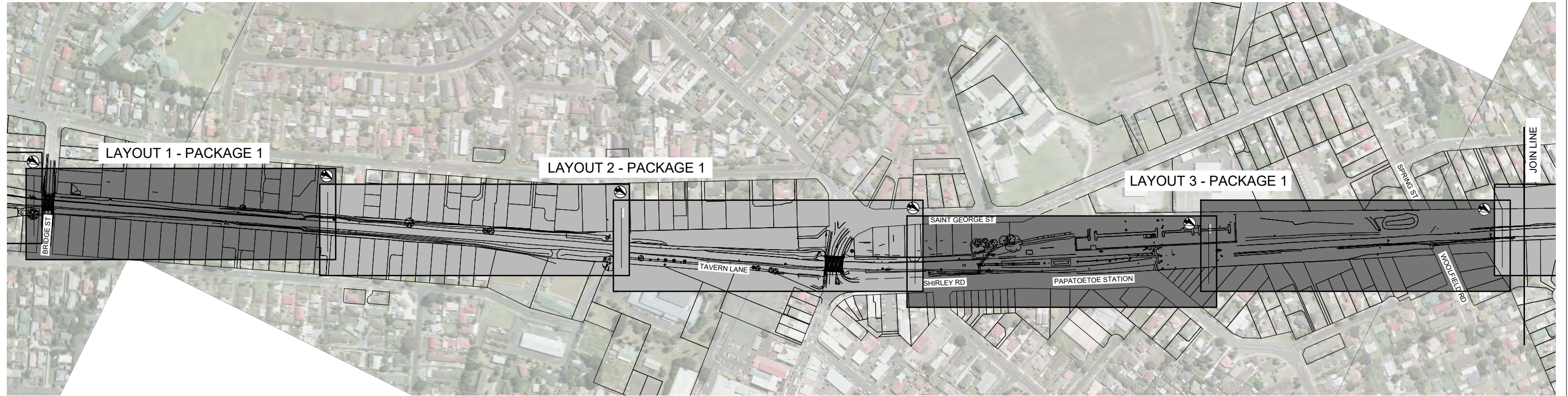
Drawing No: 1 / 6057 / 19 / 5104 /

Project No: 1-M9001.86

Date: 16th DECEMBER 2016



LOCALITY PLAN - NTS



PRELIMINARY

Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	MIDDLEMORE PRELIMINARY DESIGN	TW	20.06.12
RD	ISSUED FOR CONSENT	TW	03.07.12
RE	DETAILED DESIGN ISSUE	TW	06.07.12



Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Project
KIWIRAIL
MIDDLEMORE TO PUHINUI
NEW THIRD MAIN - STAGE 2

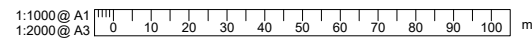
Drawn	Designed	Approved	Revision Date
A.COOK	A.COOK	T.WILSON	20.04.12

Project No. 1-C0681.00
Scale 1:2500 @ A1

SHEET OVERVIEW
LAYOUT 1 OF 1

Drawing No. 1/6057/19/5104

Sheet No.	Revision
10	RE



LEGEND - SURVEYED SERVICES

- SERVICE LIDS UNKNOWN
- STORMWATER CATCHPIT, MANHOLE, CULVERT, DOWNPIPE
- STORMWATER OPEN DRAIN, SLOT DRAIN
- WATER HYDRANT, METER, VALVE, MANHOLE
- GAS BOX, VENT
- POWER POLE, LIGHT MAST, BOX, METER, CABLE MARKER
- TELEPHONE BOX, PULL PIT
- SEWER MANHOLE

LEGEND - RELOCATED SERVICES

- RELOCATED ARTA FIBRE OPTICS
- RELOCATED FIBRE OPTICS
- RELOCATED FIBRE OPTICS KRN
- RELOCATED SIGNAL CABLE DUCT KRN
- RELOCATED TELSTRACLEAR COMMS
- NEW ACCESS CHAMBER
- PROPOSED OLE SUPPORT EXCLUSION ZONE

LEGEND - OTHER

- RAILWAY BOUNDARY
- EXISTING RAIL TRACK
- PROPOSED TRACK
- PROPERTY BOUNDARY
- STORMWATER OPEN DRAIN

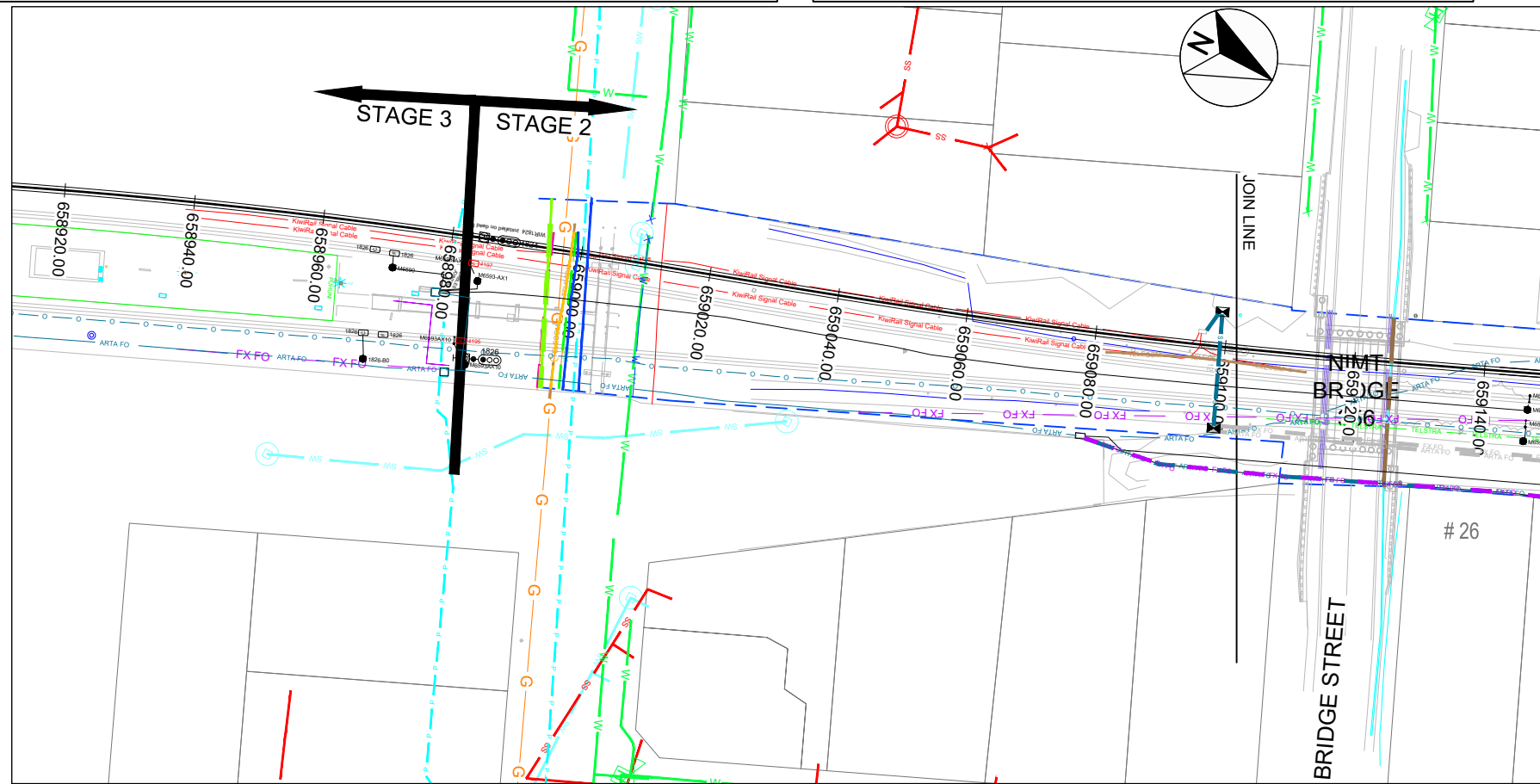
LEGEND - EXISTING SERVICES

- UNKNOWN SERVICE, FUTURE DUCTS
- AUCKLAND COUNCIL STORMWATER
- AUCKLAND COUNCIL SW MANHOLE, FITTING, CULVERT
- SURVEYED STORMWATER
- AUCKLAND COUNCIL SANITARY SEWER
- SURVEYED SANITARY SEWER
- AUCKLAND COUNCIL SS MANHOLE, FITTING, PUMP STATION, CHAMBER
- SURVEYED WATER
- WATERCARE WATER
- WATERCARE WATER VALVE, FITTING, HYDRANT, STRUCTURE
- WATERCARE TRACE
- VECTOR GAS DUCT OR OTHER
- VECTOR LOW PRESSURE GAS
- VECTOR HIGH PRESSURE GAS
- OVERHEAD TRANSPOWER
- POWER
- POWER DUCT, CABLE MARKER
- KIWI RAIL SIGNAL TRACE
- KIWI RAIL SIGNAL TRACE POWER SUPPLY
- TELSTRA CLEAR COMMUNICATIONS
- TELECOM COMMUNICATIONS
- CHORUS COMMUNICATIONS
- FIBRE OPTICS ABANDONED
- FIBRE OPTICS KIWI RAIL NEW ZEALAND ABANDONED
- FIBRE OPTICS AUCKLAND REGIONAL TRANSPORT AUTHORITY
- EXTRA PRECAUTION REQUIRED AROUND THESE SERVICES

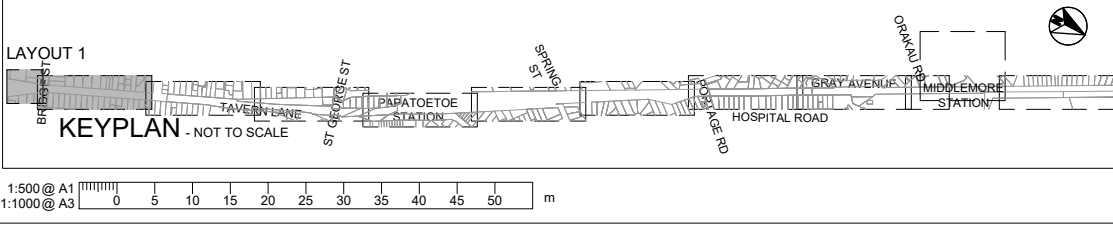
SERVICES NOTES:

- LOCATION OF ALL EXISTING SERVICES ARE INDICATIVE ONLY AND ARE BASED ON INFORMATION PROVIDED BY
 - UTILITIES COMPANIES
 - OPUS SURVEYS
 - KIWI RAIL SURVEYS
 - INTERPOLATING AS-BUILT RECORDS
 - CKL SURVEYS
 - ADDITIONAL SURVEYS (SOMETIMES HARDCOPY ONLY)
 - KIWI RAIL SURVEYS
- EXISTING SERVICES LOCATIONS TO BE CONFIRMED ON SITE BY CONTRACTOR AFTER LIAISON WITH APPROPRIATE UTILITIES COMPANIES
- EXISTING LOCATION OF SIGNAL EQUIPMENT / LINES IS INDICATIVE ONLY AND ARE BASED ON DRAWING NO. "MA 50 SIGNAL DESIGN - REV 16" WHICH SHOULD BE CONFIRMED ON SITE BY A KIWI RAIL REPRESENTATIVE
- SERVICES RELOCATIONS AND PROTECTIONS CARRIED OUT BY A SUITABLY QUALIFIED CONTRACTOR AS PART OF THE TEMPORARY/ENABLING WORKS. INFORMATION SUPPLIED BY KIWI RAIL HAS BEEN ADDED
- FIBRE OPTIC BACKBONE ENABLING WORKS SHOWN BOLD COLOUR AS PER LEGEND AND DISUSED ONES ARE REPRESENTED IN THIN LINE TYPES.
- LEVEL DATUM IN TERMS OF LINZ DATUM 1946
- EXISTING LEVELS SHOWN ARE TAKEN FROM EITHER SURVEY (PREFERENCE) OR GIS RECORDS, IL = INVERT LEVEL (CLOCKWISE FROM NORTH) LL = LID LEVEL, OL = OVERT LEVEL
- ALL LEVELS SHOWN ARE IN TERMS OF REDUCED LEVEL, IN METER UNITS
- ALL DIAMETER DIMENSIONS ARE GIVEN IN MILLIMETRES EG 1050Ø = 1.050m DIAMETER
- EXTRA PRECAUTION IS NEEDED AROUND SERVICES HIGHLIGHTED YELLOW
- KIWI RAIL SIGNAL REQUIREMENTS REFER TO MA50 SIGNAL DESIGN - REV16
- DO NOT SCALE FROM THESE DRAWINGS
- RAIL DESIGNATION AND PROPERTY BOUNDARIES AS PROVIDED BY AC AND TERRAVIEW RESPECTIVELY.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND AVOIDING CLASHES WITH ALL OTHER SERVICES.
- CABLE ROUTES ARE INDICATIVE. FINAL POSITION TO BE APPROVED BY CLIENT REPRESENTATIVE
- THE FINAL POSITION OF THE DUCTS SHALL BE APPROVED APPROPRIATE SERVICES PROVIDER

300 mm
DM
200
100
50
10 mm



85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 20.04.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project: KIWI RAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2

Sheet: EXISTING SERVICES LAYOUT 1 OF 8

Drawing No: 1/6057/19/5104

Sheet No: 20
Revision: RD

LEGEND - SURVEYED SERVICES

- SERVICE LIDS UNKNOWN
- ⊕ STORMWATER CATCHPIT, MANHOLE, CULVERT, DOWNPIPE
- STORMWATER OPEN DRAIN, SLOT DRAIN
- ⊕ WATER HYDRANT, METER, VALVE, MANHOLE
- ⊕ GAS BOX, VENT
- ⊕ POWER POLE, LIGHT MAST, BOX, METER, CABLE MARKER
- ⊕ TELEPHONE BOX, PULL PIT
- ⊕ SEWER MANHOLE

LEGEND - RELOCATED SERVICES

- RELOCATED ARTA FIBRE OPTICS
- RELOCATED FIBRE OPTICS
- RELOCATED FIBRE OPTICS KRN
- RELOCATED SIGNAL CABLE DUCT KRN
- RELOCATED TELSTRACLEAR COMMS
- ⊕ NEW ACCESS CHAMBER
- ⊕ PROPOSED OLE SUPPORT EXCLUSION ZONE

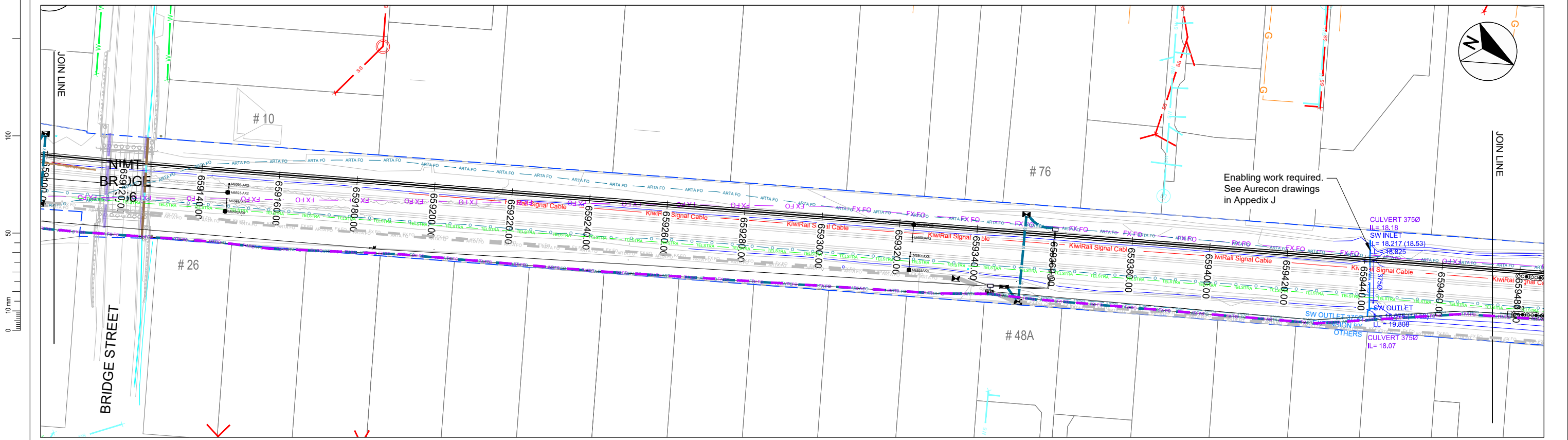
LEGEND - OTHER

- RAILWAY BOUNDARY
- EXISTING RAIL TRACK
- PROPOSED TRACK
- PROPERTY BOUNDARY
- STORMWATER OPEN DRAIN

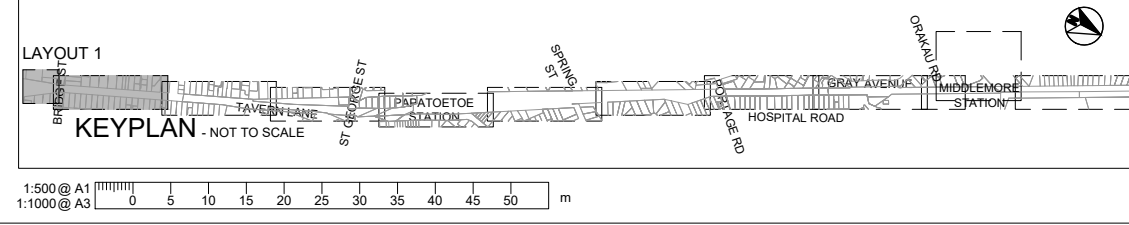
LEGEND - EXISTING SERVICES

- UNKNOWN SERVICE, FUTURE DUCTS
- AUCKLAND COUNCIL STORMWATER
- ⊕ AUCKLAND COUNCIL SW MANHOLE, FITTING, CULVERT
- SURVEYED STORMWATER
- AUCKLAND COUNCIL SANITARY SEWER
- SURVEYED SANITARY SEWER
- ⊕ AUCKLAND COUNCIL SS MANHOLE, FITTING, PUMP STATION, CHAMBER
- SURVEYED WATER
- WATERCARE WATER
- ⊕ WATERCARE WATER VALVE, FITTING, HYDRANT, STRUCTURE
- WATERCARE TRACE
- VECTOR GAS DUCT OR OTHER
- VECTOR LOW PRESSURE GAS
- VECTOR HIGH PRESSURE GAS
- OVERHEAD TRANSPOWER
- POWER
- ⊕ POWER DUCT, CABLE MARKER
- KiwiRail Signal Cable
- KIWIRAIL SIGNAL TRACE
- KIWIRAIL SIGNAL TRACE POWER SUPPLY
- TELSTRA
- TELSTRA CLEAR COMMUNICATIONS
- TELECOM
- TELECOM COMMUNICATIONS
- CHORUS COMMUNICATIONS
- FX FO
- FIBRE OPTICS ABANDONED
- KRN FO
- FIBRE OPTICS KIWIRAIL NEW ZEALAND ABANDONED
- ARTA FO
- FIBRE OPTICS AUCKLAND REGIONAL TRANSPORT AUTHORITY
- EXTRA PRECAUTION REQUIRED AROUND THESE SERVICES

- ### SERVICES NOTES:
- LOCATION OF ALL EXISTING SERVICES ARE INDICATIVE ONLY AND ARE BASED ON INFORMATION PROVIDED BY
 - UTILITIES COMPANIES
 - OPUS SURVEYS
 - KIWIRAIL SURVEYS
 - INTERPOLATING AS-BUILT RECORDS
 - CKL SURVEYS
 - ADDITIONAL SURVEYS (SOMETIMES HARDCOPY ONLY)
 - KIWIRAIL SURVEYS
 - EXISTING SERVICES LOCATIONS TO BE CONFIRMED ON SITE BY CONTRACTOR AFTER LIAISON WITH APPROPRIATE UTILITIES COMPANIES
 - EXISTING LOCATION OF SIGNAL EQUIPMENT / LINES IS INDICATIVE ONLY AND ARE BASED ON DRAWING NO. "MA 50 SIGNAL DESIGN - REV 16" WHICH SHOULD BE CONFIRMED ON SITE BY A KIWIRAIL REPRESENTATIVE
 - SERVICES RELOCATIONS AND PROTECTIONS CARRIED OUT BY A SUITABLY QUALIFIED CONTRACTOR AS PART OF THE TEMPORARY/ENABLING WORKS. INFORMATION SUPPLIED BY KIWIRAIL HAS BEEN ADDED
 - FIBRE OPTIC BACKBONE ENABLING WORKS SHOWN BOLD COLOUR AS PER LEGEND AND DISUSED ONES ARE REPRESENTED IN THIN LINE TYPES.
 - LEVEL DATUM IN TERMS OF LINZ DATUM 1946
 - EXISTING LEVELS SHOWN ARE TAKEN FROM EITHER SURVEY (PREFERENCE) OR GIS RECORDS, IL = INVERT LEVEL (CLOCKWISE FROM NORTH) LL = LID LEVEL, OL = OVERT LEVEL
 - ALL LEVELS SHOWN ARE IN TERMS OF REDUCED LEVEL, IN METER UNITS
 - ALL DIAMETER DIMENSIONS ARE GIVEN IN MILLIMETRES EG 1050Ø = 1.050m DIAMETER
 - EXTRA PRECAUTION IS NEEDED AROUND SERVICES HIGHLIGHTED YELLOW
 - KIWIRAIL SIGNAL REQUIREMENTS REFER TO MA50 SIGNAL DESIGN - REV16 DO NOT SCALE FROM THESE DRAWINGS
 - RAIL DESIGNATION AND PROPERTY BOUNDARIES AS PROVIDED BY AC AND TERRAVIEW RESPECTIVELY.
 - THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND AVOIDING CLASHES WITH ALL OTHER SERVICES.
 - CABLE ROUTES ARE INDICATIVE. FINAL POSITION TO BE APPROVED BY CLIENT REPRESENTATIVE
 - THE FINAL POSITION OF THE DUCTS SHALL BE APPROVED APPROPRIATE SERVICES PROVIDER



85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



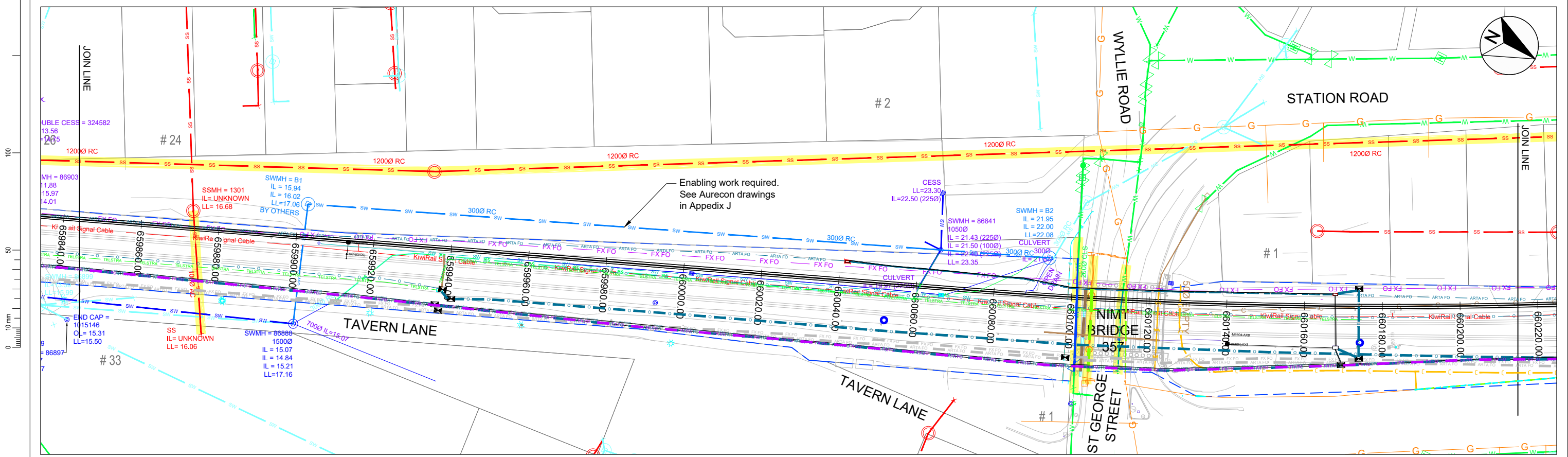
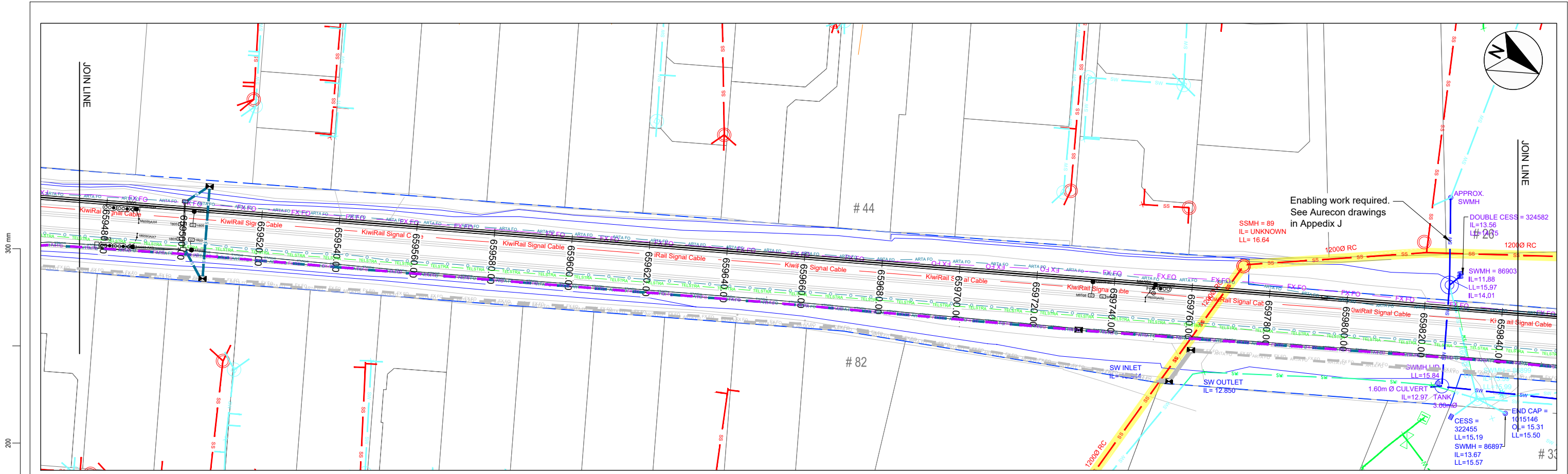
OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

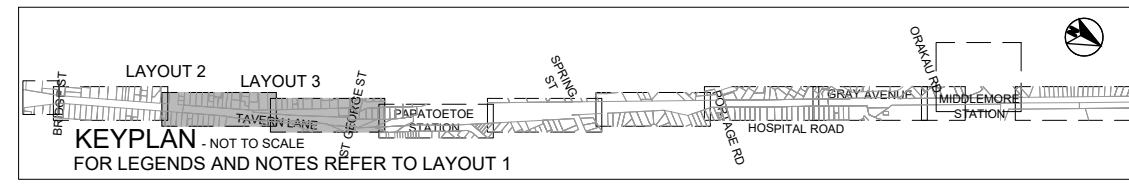
Drawn: VARIOUS
Designed: T.WILSON
Approved: T.WILSON
Revision Date: 20.04.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project		Sheet No.		Revision	
KIWIRAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2		21		RD	
EXISTING SERVICES LAYOUT 2 OF 8		Drawing No.		Revision	
		1/6057/19/5104			



85% ISSUE



1:500 @ A1
1:1000 @ A3
0 5 10 15 20 25 30 35 40 45 50 m
Plot Date 09/07/12 @ 15:11 k:\kiwirail\1_6057_19\5104\1_6057_19_5104_20-27.dwg - 22

Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



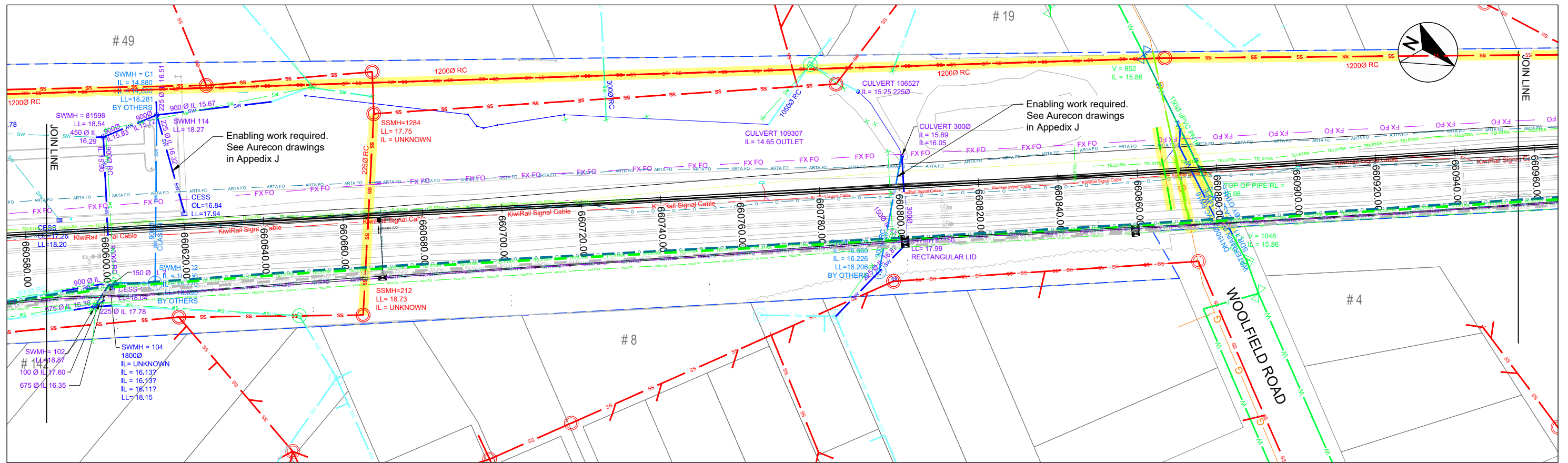
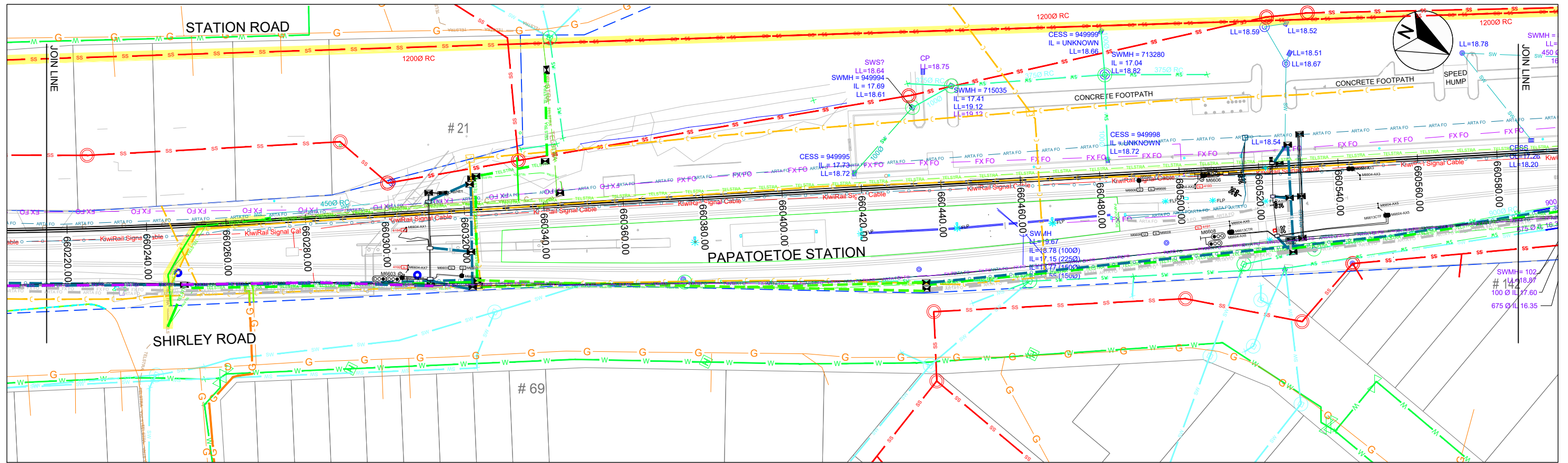
OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

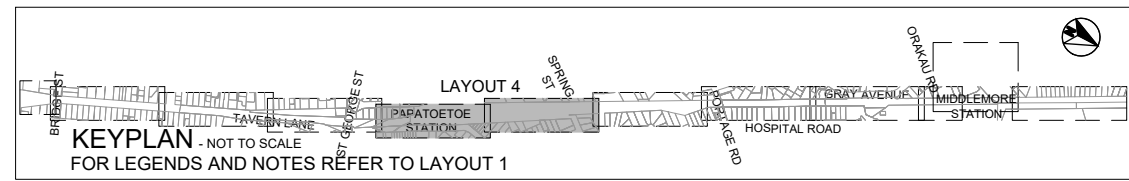
Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 20.04.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project		Sheet	
KIWI RAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2		EXISTING SERVICES LAYOUT 3 OF 8	
Drawn No:	1/6057/19/5104	Sheet No:	22
Revision:	RD	Revision:	RD



85% ISSUE



1:500 @ A1
1:1000 @ A3

0 5 10 15 20 25 30 35 40 45 50 m

Original Sheet Size A1 [841x594] Plot Date 09/07/12 @ 15:11 k:\kiwirail\1_6057_19\5104\1_6057_19_5104_20-27.dwg - 23

Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



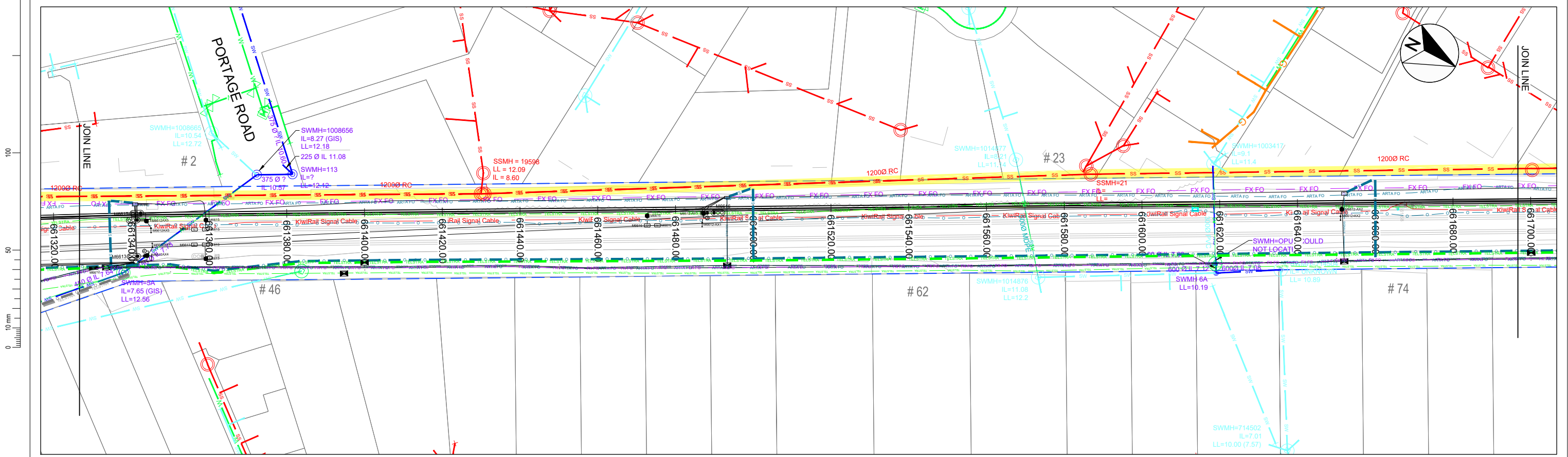
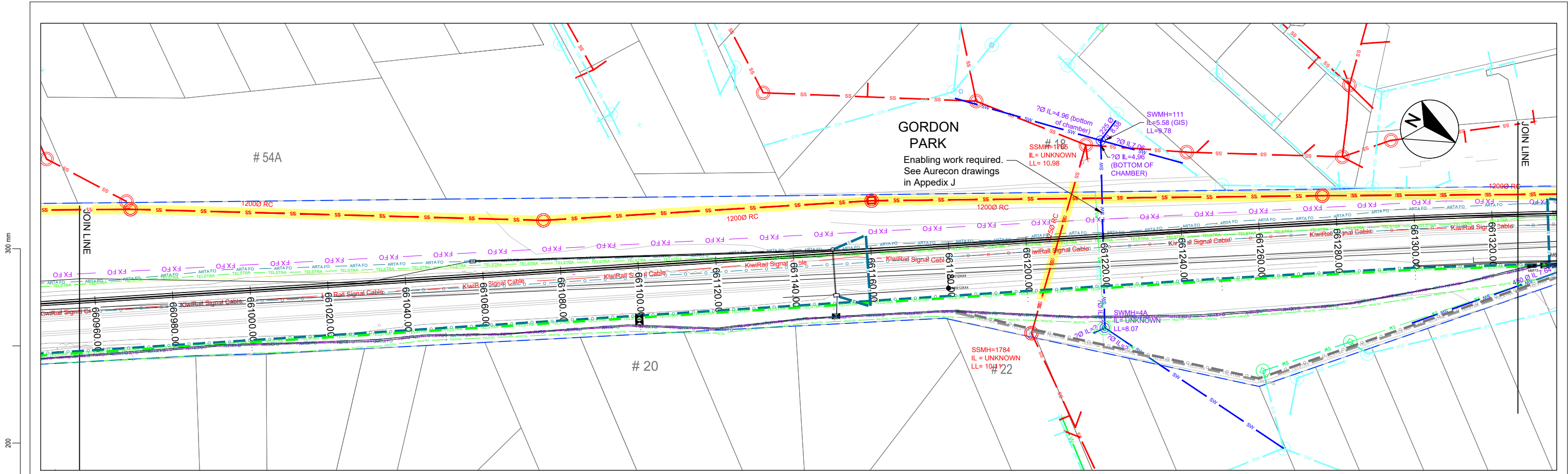
OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

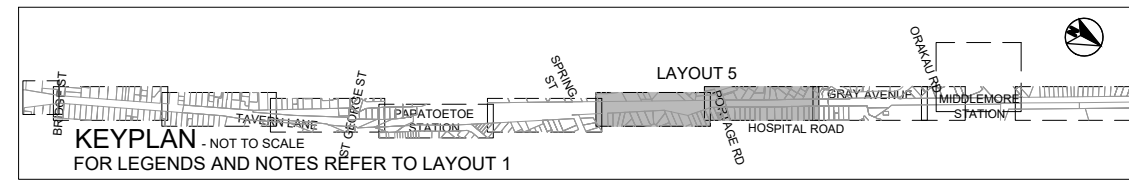
Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 20.04.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project		Sheet	
KIWIRAIL MIDDLEMORE TO PUHINI NEW THIRD MAIN - STAGE 2		EXISTING SERVICES LAYOUT 4 OF 8	
Project No:	1-C0681.00	Sheet No:	23
Revision:	RD	Revision:	RD



85% ISSUE



1:500 @ A1
1:1000 @ A3
0 5 10 15 20 25 30 35 40 45 50 m
Original Sheet Size A1 [841x594] Plot Date 09/07/12 @ 15:11 k:\kiwirail\1_6057_19\5104_20-27.dwg - 24

Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



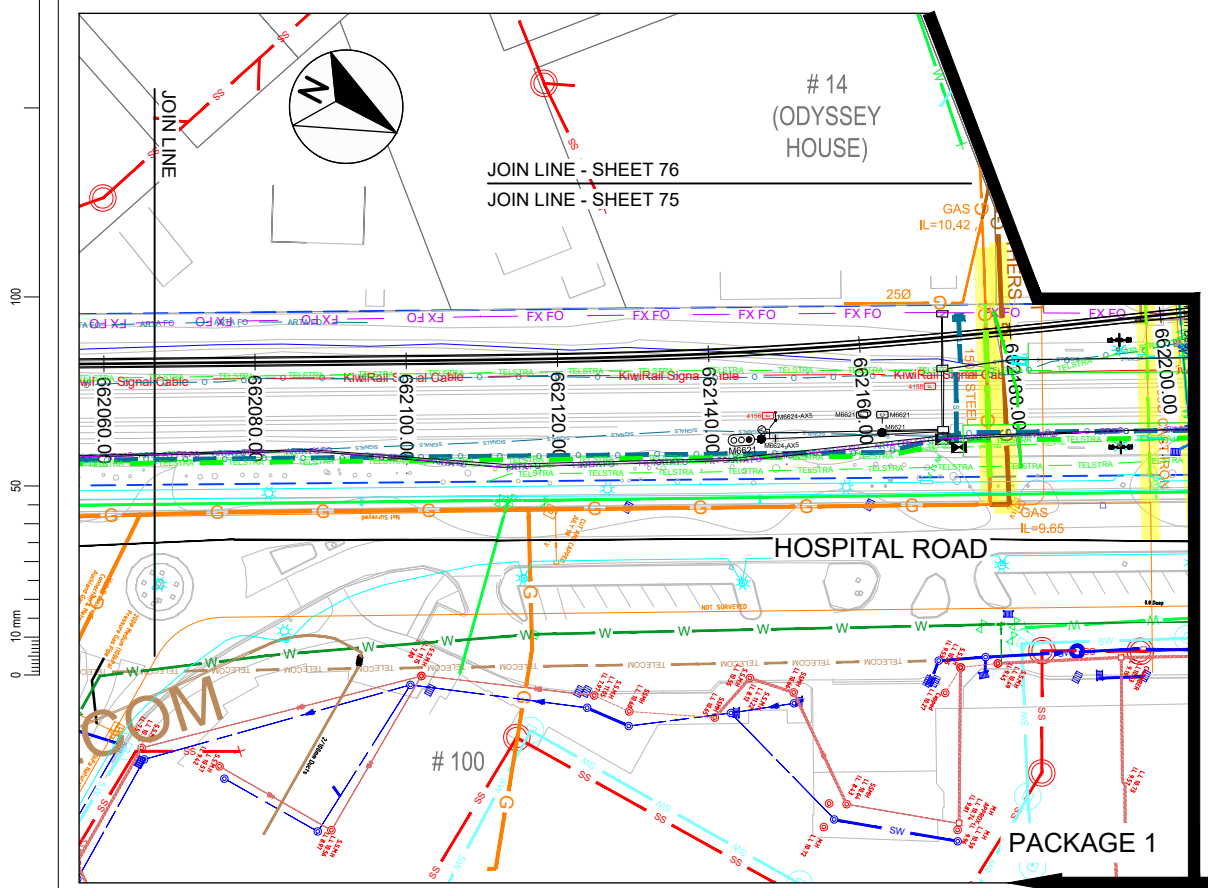
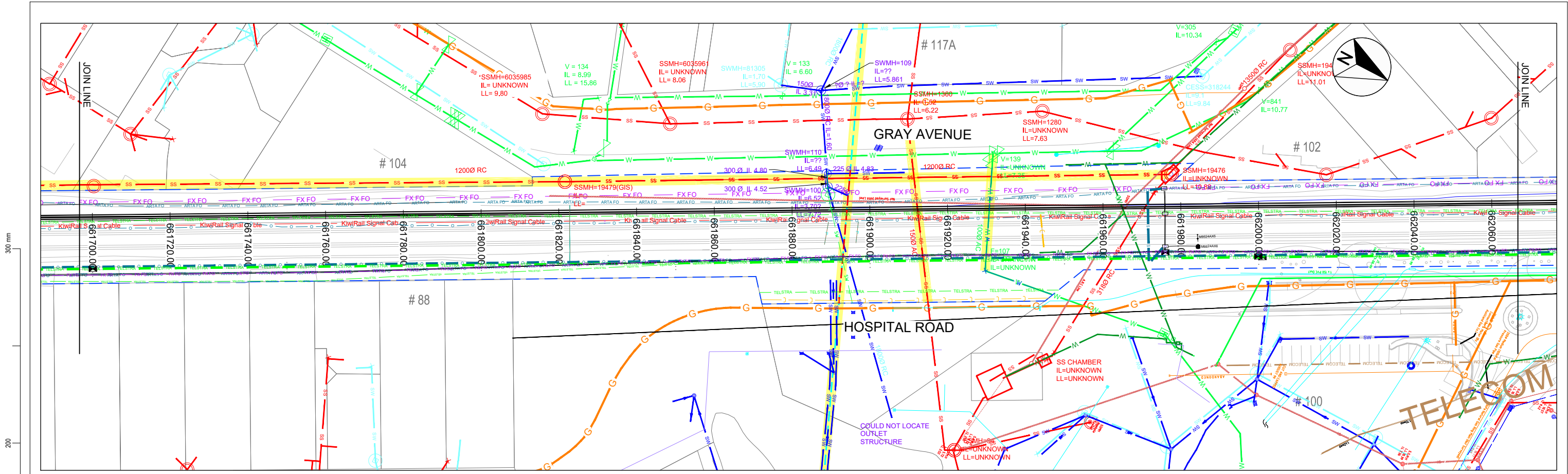
OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 20.04.12

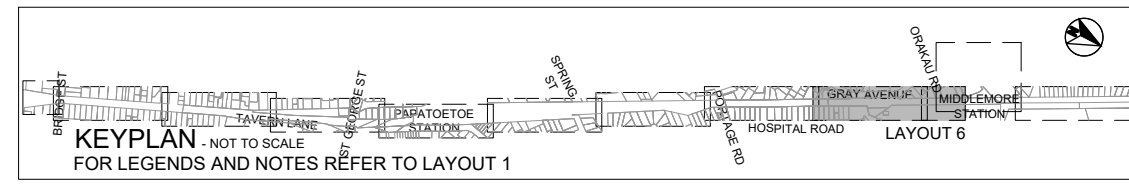
Project No: 1-C0681.00
Scale: 1:500 @ A1

Project	
KIWIRAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2	
Sheet	
EXISTING SERVICES LAYOUT 5 OF 8	
Sheet No.	Revision
24	RD



NOTE:
LAYOUT 6 CONTAINS
MIDDLEMORE STATION
(PACKAGE 2 - ISSUED SEPARATELY)

85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	ISSUED IN INFRASTRUCTURE REPORT	TW	20.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 20.04.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project		Sheet No.	Revision
KIWI RAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2		25	RD
EXISTING SERVICES LAYOUT 6 OF 8		Drawing No: 1/6057/19/5104	

LEGEND - SURVEYED SERVICES

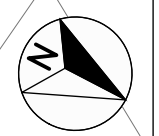
- ○ SERVICE LIDS UNKNOWN
- ⊕ ⊙ ⊗ ⊕ STORMWATER CATCHPIT, MANHOLE, CULVERT, DOWNPIPE
- STORMWATER OPEN DRAIN, SLOT DRAIN
- ⊕ ⊙ ⊗ ⊕ WATER HYDRANT, METER, VALVE, MANHOLE
- ⊕ ⊙ ⊗ ⊕ GAS BOX, VENT
- ⊕ ⊙ ⊗ ⊕ POWER POLE, LIGHT MAST, BOX, METER, CABLE MARKER
- ⊕ ⊙ ⊗ ⊕ TELEPHONE BOX, PULL PIT
- ⊕ ⊙ ⊗ ⊕ SEWER MANHOLE

SERVICES NOTES:

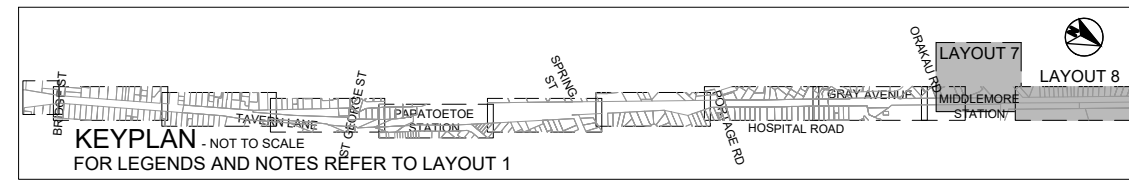
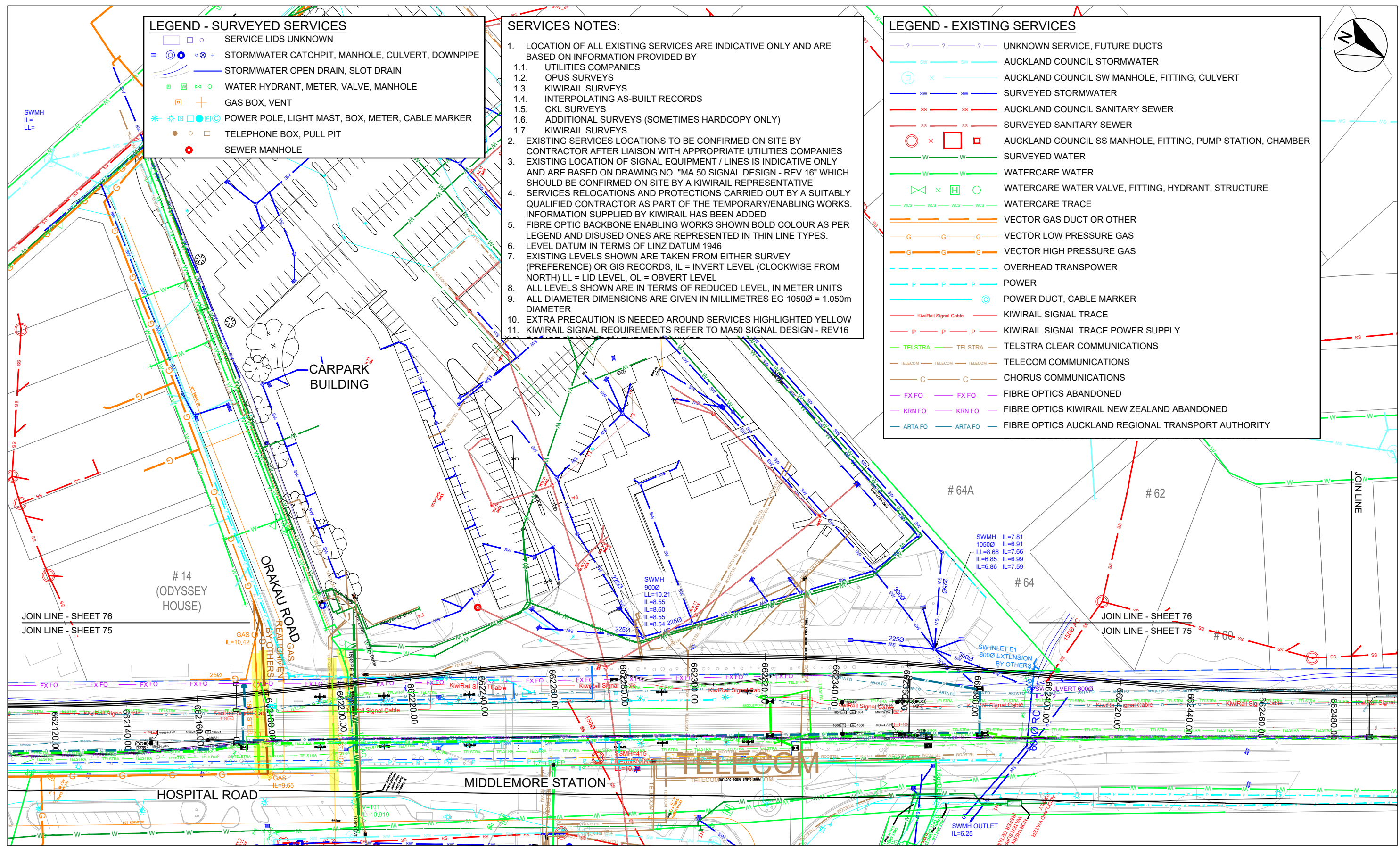
- LOCATION OF ALL EXISTING SERVICES ARE INDICATIVE ONLY AND ARE BASED ON INFORMATION PROVIDED BY
 - UTILITIES COMPANIES
 - OPUS SURVEYS
 - KIWRIL SURVEYS
 - INTERPOLATING AS-BUILT RECORDS
 - CKL SURVEYS
 - ADDITIONAL SURVEYS (SOMETIMES HARDCOPY ONLY)
 - KIWRIL SURVEYS
- EXISTING SERVICES LOCATIONS TO BE CONFIRMED ON SITE BY CONTRACTOR AFTER LIAISON WITH APPROPRIATE UTILITIES COMPANIES
- EXISTING LOCATION OF SIGNAL EQUIPMENT / LINES IS INDICATIVE ONLY AND ARE BASED ON DRAWING NO. "MA 50 SIGNAL DESIGN - REV 16" WHICH SHOULD BE CONFIRMED ON SITE BY A KIWRIL REPRESENTATIVE
- SERVICES RELOCATIONS AND PROTECTIONS CARRIED OUT BY A SUITABLY QUALIFIED CONTRACTOR AS PART OF THE TEMPORARY/ENABLING WORKS. INFORMATION SUPPLIED BY KIWRIL HAS BEEN ADDED
- FIBRE OPTIC BACKBONE ENABLING WORKS SHOWN BOLD COLOUR AS PER LEGEND AND DISUSED ONES ARE REPRESENTED IN THIN LINE TYPES.
- LEVEL DATUM IN TERMS OF LINZ DATUM 1946
- EXISTING LEVELS SHOWN ARE TAKEN FROM EITHER SURVEY (PREFERENCE) OR GIS RECORDS, IL = INVERT LEVEL (CLOCKWISE FROM NORTH) LL = LID LEVEL, OL = OBVERT LEVEL
- ALL LEVELS SHOWN ARE IN TERMS OF REDUCED LEVEL, IN METER UNITS
- ALL DIAMETER DIMENSIONS ARE GIVEN IN MILLIMETRES EG 1050Ø = 1.050m DIAMETER
- EXTRA PRECAUTION IS NEEDED AROUND SERVICES HIGHLIGHTED YELLOW
- KIWRIL SIGNAL REQUIREMENTS REFER TO MA50 SIGNAL DESIGN - REV16

LEGEND - EXISTING SERVICES

- ? — ? — ? — UNKNOWN SERVICE, FUTURE DUCTS
- SW — SW — SW AUCKLAND COUNCIL STORMWATER
- ⊕ ⊙ ⊗ ⊕ AUCKLAND COUNCIL SW MANHOLE, FITTING, CULVERT
- SS — SS — SS SURVEYED STORMWATER
- ⊕ ⊙ ⊗ ⊕ AUCKLAND COUNCIL SS MANHOLE, FITTING, PUMP STATION, CHAMBER
- W — W — W SURVEYED WATER
- W — W — W WATERCARE WATER
- ⊕ ⊙ ⊗ ⊕ WATERCARE WATER VALVE, FITTING, HYDRANT, STRUCTURE
- WCS — WCS — WCS WATERCARE TRACE
- G — G — G VECTOR GAS DUCT OR OTHER
- G — G — G VECTOR LOW PRESSURE GAS
- G — G — G VECTOR HIGH PRESSURE GAS
- P — P — P OVERHEAD TRANSPOWER
- P — P — P POWER
- ⊕ ⊙ ⊗ ⊕ POWER DUCT, CABLE MARKER
- KiwiRail Signal Cable — KiwiRail Signal Cable — KIWRIL SIGNAL TRACE
- P — P — P KIWRIL SIGNAL TRACE POWER SUPPLY
- TELSTRA — TELSTRA — TELSTRA TELSTRA CLEAR COMMUNICATIONS
- TELECOM — TELECOM — TELECOM TELECOM COMMUNICATIONS
- C — C — C CHORUS COMMUNICATIONS
- FX FO — FX FO — FX FO FIBRE OPTICS ABANDONED
- KRN FO — KRN FO — KRN FO FIBRE OPTICS KIWRIL NEW ZEALAND ABANDONED
- ARTA FO — ARTA FO — ARTA FO FIBRE OPTICS AUCKLAND REGIONAL TRANSPORT AUTHORITY



300 mm
200
100
50
10 mm



Revision	Amendment	Approved	Revision Date
RA	MIDDLEMORE PRELIMINARY DESIGN	TW	15.06.12
RB	85% ISSUE	PW	16.12.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

Drawn: VARIOUS
Designed: VARIOUS
Approved: T.WILSON
Revision Date: 15.06.12

Project No: 1-C0681.00
Scale: 1:500 @ A1

Project	KIWRIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2
Sheet	EXISTING SERVICES LAYOUT 7 OF 8
Drawn No.	1/6057/19/5104
Sheet No.	26
Revision	RB

85% ISSUE

LEGEND - SURVEYED SERVICES

- ○ SERVICE LIDS UNKNOWN
- ⊕ ⊗ ⊙ ⊕ STORMWATER CATCHPIT, MANHOLE, CULVERT, DOWNPIPE
- STORMWATER OPEN DRAIN, SLOT DRAIN
- ⊕ ⊗ ⊙ ⊕ WATER HYDRANT, METER, VALVE, MANHOLE
- ⊕ ⊗ ⊙ ⊕ GAS BOX, VENT
- ⊕ ⊗ ⊙ ⊕ POWER POLE, LIGHT MAST, BOX, METER, CABLE MARKER
- ⊕ ⊗ ⊙ ⊕ TELEPHONE BOX, PULL PIT
- ⊕ ⊗ ⊙ ⊕ SEWER MANHOLE

SERVICES NOTES:

1. LOCATION OF ALL EXISTING SERVICES ARE INDICATIVE ONLY AND ARE BASED ON INFORMATION PROVIDED BY
 - 1.1. UTILITIES COMPANIES
 - 1.2. OPUS SURVEYS
 - 1.3. KIWIRAIL SURVEYS
 - 1.4. INTERPOLATING AS-BUILT RECORDS
 - 1.5. CKL SURVEYS
 - 1.6. ADDITIONAL SURVEYS (SOMETIMES HARDCOPY ONLY)
 - 1.7. KIWIRAIL SURVEYS
2. EXISTING SERVICES LOCATIONS TO BE CONFIRMED ON SITE BY CONTRACTOR AFTER LIAISON WITH APPROPRIATE UTILITIES COMPANIES
3. EXISTING LOCATION OF SIGNAL EQUIPMENT / LINES IS INDICATIVE ONLY AND ARE BASED ON DRAWING NO. "MA 50 SIGNAL DESIGN - REV 16" WHICH SHOULD BE CONFIRMED ON SITE BY A KIWIRAIL REPRESENTATIVE
4. SERVICES RELOCATIONS AND PROTECTIONS CARRIED OUT BY A SUITABLY QUALIFIED CONTRACTOR AS PART OF THE TEMPORARY/ENABLING WORKS. INFORMATION SUPPLIED BY KIWIRAIL HAS BEEN ADDED
5. FIBRE OPTIC BACKBONE ENABLING WORKS SHOWN BOLD COLOUR AS PER LEGEND AND DISUSED ONES ARE REPRESENTED IN THIN LINE TYPES.
6. LEVEL DATUM IN TERMS OF LINZ DATUM 1946
7. EXISTING LEVELS SHOWN ARE TAKEN FROM EITHER SURVEY (PREFERENCE) OR GIS RECORDS, IL = INVERT LEVEL (CLOCKWISE FROM NORTH) LL = LID LEVEL, OL = OBVERT LEVEL
8. ALL LEVELS SHOWN ARE IN TERMS OF REDUCED LEVEL, IN METER UNITS
9. ALL DIAMETER DIMENSIONS ARE GIVEN IN MILLIMETRES EG 1050Ø = 1.050m DIAMETER
10. EXTRA PRECAUTION IS NEEDED AROUND SERVICES HIGHLIGHTED YELLOW
11. KIWIRAIL SIGNAL REQUIREMENTS REFER TO MA50 SIGNAL DESIGN - REV16
12. DO NOT SCALE FROM THESE DRAWINGS
13. RAIL DESIGNATION AND PROPERTY BOUNDARIES AS PROVIDED BY AC AND TERRAVIEW RESPECTIVELY.
14. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND AVOIDING CLASHES WITH ALL OTHER SERVICES.
15. CABLE ROUTES ARE INDICATIVE. FINAL POSITION TO BE APPROVED BY CLIENT REPRESENTATIVE
16. THE FINAL POSITION OF THE DUCTS SHALL BE APPROVED APPROPRIATE SERVICES PROVIDER

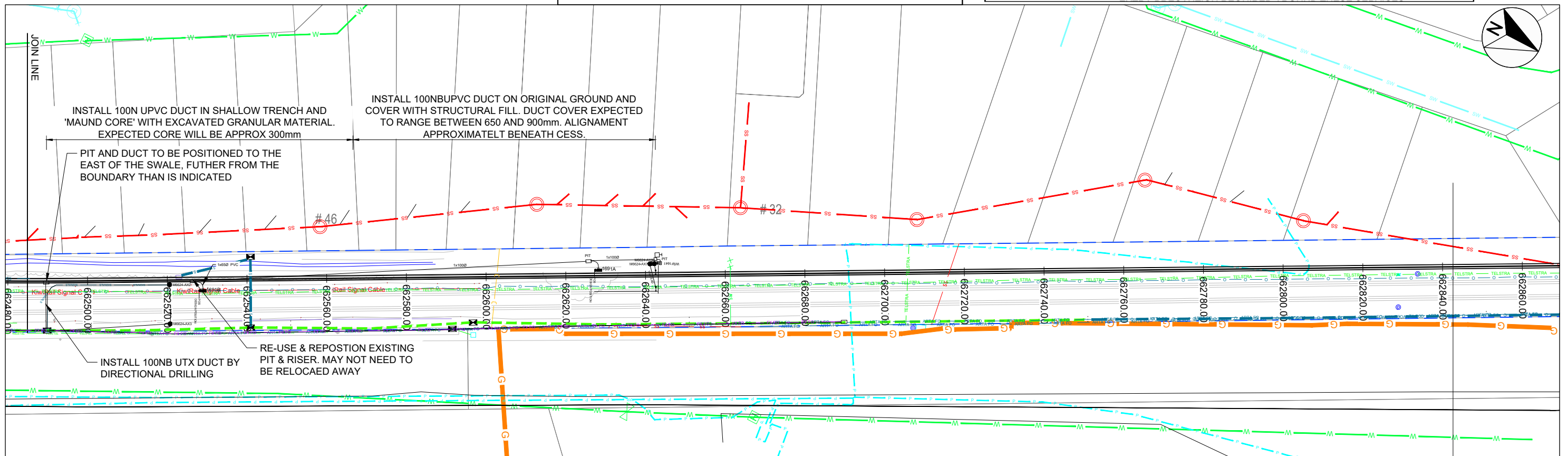
LEGEND - EXISTING SERVICES

- ? — ? — ? — UNKNOWN SERVICE, FUTURE DUCTS
- SW — SW — SW — AUCKLAND COUNCIL STORMWATER
- ⊕ ⊗ ⊙ ⊕ AUCKLAND COUNCIL SW MANHOLE, FITTING, CULVERT
- SW — SW — SW — SURVEYED STORMWATER
- SS — SS — SS — AUCKLAND COUNCIL SANITARY SEWER
- SS — SS — SS — SURVEYED SANITARY SEWER
- ⊕ ⊗ ⊙ ⊕ AUCKLAND COUNCIL SS MANHOLE, FITTING, PUMP STATION, CHAMBER
- W — W — W — SURVEYED WATER
- W — W — W — WATERCARE WATER
- ⊕ ⊗ ⊙ ⊕ WATERCARE WATER VALVE, FITTING, HYDRANT, STRUCTURE
- WCS — WCS — WCS — WCS — WATERCARE TRACE
- G — G — G — VECTOR GAS DUCT OR OTHER
- G — G — G — VECTOR LOW PRESSURE GAS
- G — G — G — VECTOR HIGH PRESSURE GAS
- — — — OVERHEAD TRANSPOWER
- P — P — P — POWER
- ⊕ ⊗ ⊙ ⊕ POWER DUCT, CABLE MARKER
- KiwiRail Signal Cable — — — — KIWIRAIL SIGNAL TRACE
- P — P — P — KIWIRAIL SIGNAL TRACE POWER SUPPLY
- TELSTRA — TELSTRA — TELSTRA — TELSTRA CLEAR COMMUNICATIONS
- TELECOM — TELECOM — TELECOM — TELECOM COMMUNICATIONS
- C — C — C — CHORUS COMMUNICATIONS
- FX FO — FX FO — FX FO — FIBRE OPTICS ABANDONED
- KRN FO — KRN FO — KRN FO — FIBRE OPTICS KIWIRAIL NEW ZEALAND ABANDONED
- ARTA FO — ARTA FO — ARTA FO — FIBRE OPTICS AUCKLAND REGIONAL TRANSPORT AUTHORITY

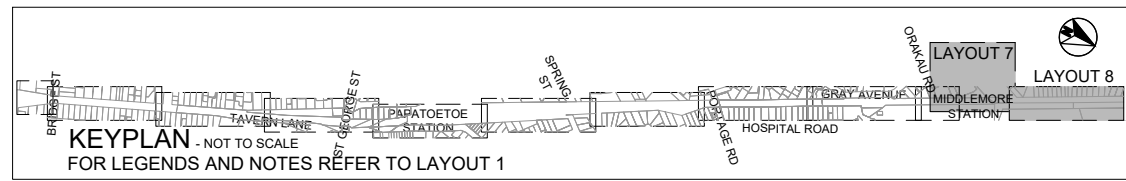
LEGEND

- ROUTE TO BE INSTALLED BY CIVIL CONTRACTOR
- CONCRETE SIGNAL BASE
- 600x600 PIT. STANDARD PIT TO BE INSTALLED
- 1200x600 PIT (EITHER ONE PIECE OR KIT SET, WITH RISERS AS REQUIRED. STANDARD PIT TO BE INSTALLED.
- FLEXIBLE HOSE OR DUCT INSTALLED BY SIGNALLING CONTRACTOR OR KR SIGNAL STAFF.

300 mm
200
100
50
10 mm
0



85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	MIDDLEMORE PRELIMINARY DESIGN	TW	15.06.12
RB	85% ISSUE	PW	16.12.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76 725
Manukau 2241
New Zealand

Drawn: VARIOUS, Designed: VARIOUS, Approved: T.WILSON, Revision Date: 15.06.12

Project No: 1-C0681.00, Scale: 1:500 @ A1

Project KIWIRAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2	
Sheet EXISTING SERVICES LAYOUT 8 OF 8	
Drawn No: 1/6057/19/5104	Sheet No: 27
Revision RB	

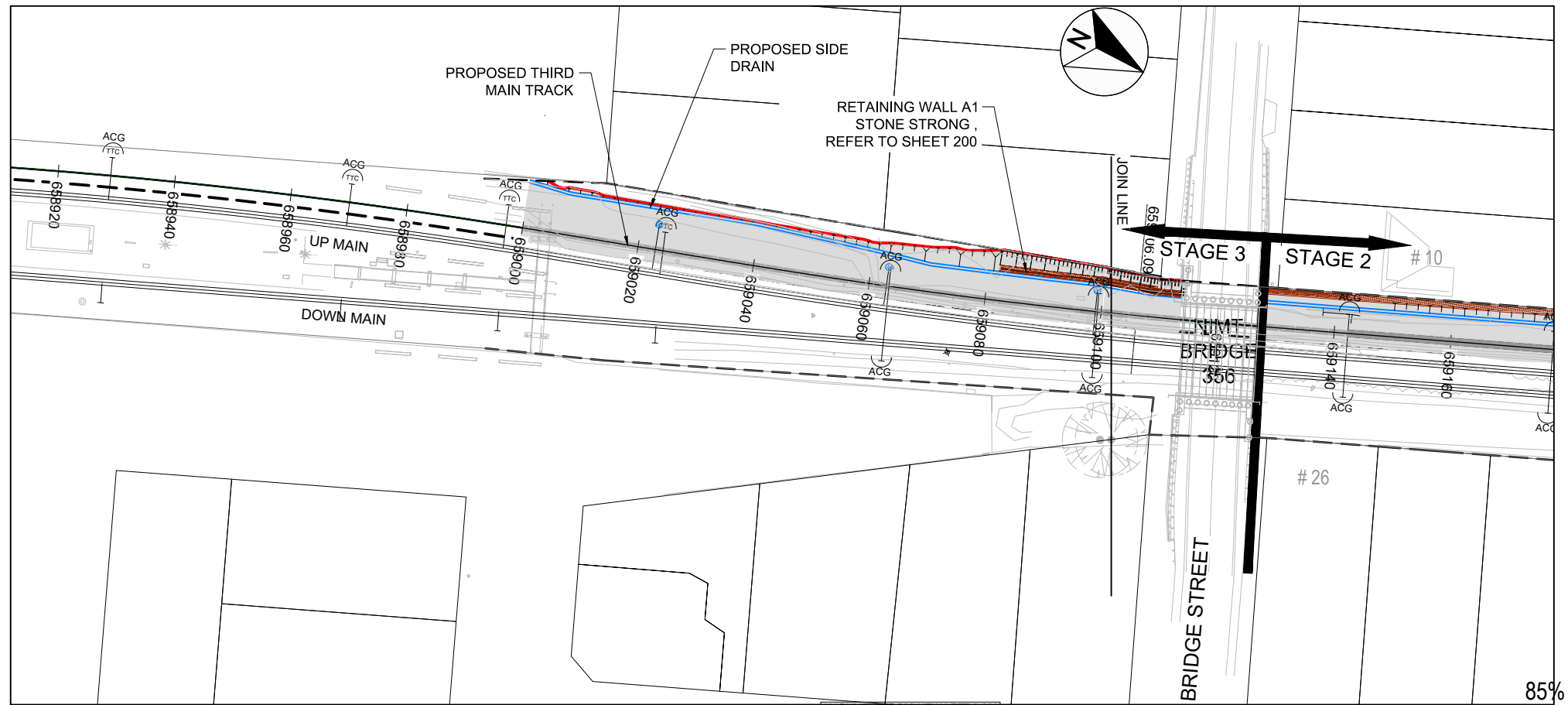
NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL SPECIFICATION
2. FOR ADDITIONAL DESIGN INFORMATION AROUND MIDDLEMORE STATION, REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL, AND STRUCTURAL DRAWINGS
3. FOR STORMWATER DESIGN INFORMATION REFER TO PLANS 300-327

LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- PROPOSED BOUNDARY
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- ACG (TTC) OVERHEAD LINE EQUIPMENT (OLE)
- WALL
- EARTHWORKS EXTENT - CUT
- EARTHWORKS EXTENT - FILL
- SIDE DRAIN
- EXTENT OF WORKS

300 mm
200
100
50
0 10 mm



85% ISSUE

LAYOUT 1



1:500 @ A1
1:1000 @ A3

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



PO Box 76725
Manukau 2241
New Zealand

Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12

Project No. 1-M9001.86
Scale 1:500 @ A1

Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
CIVIL SITE PLAN
LAYOUT 1 OF 8

Drawing No. 1/6057/19/5104

Sheet No. 70
Revision RF

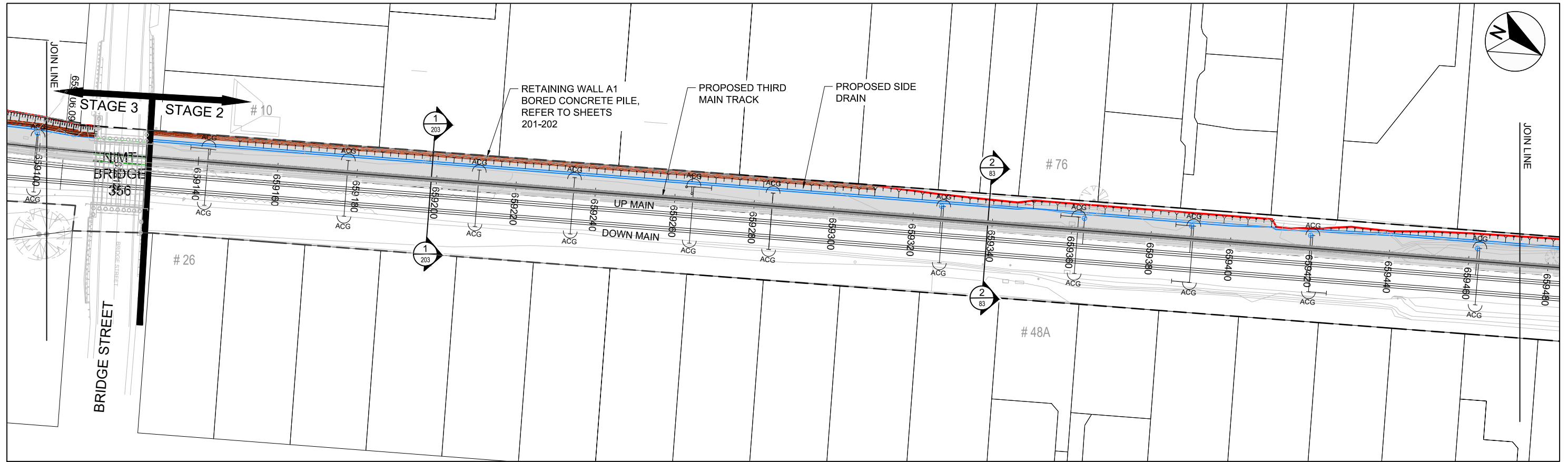
NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL SPECIFICATION
2. FOR ADDITIONAL DESIGN INFORMATION AROUND MIDDLEMORE STATION, REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL, AND STRUCTURAL DRAWINGS
3. FOR STORMWATER DESIGN INFORMATION REFER TO PLANS 300-327

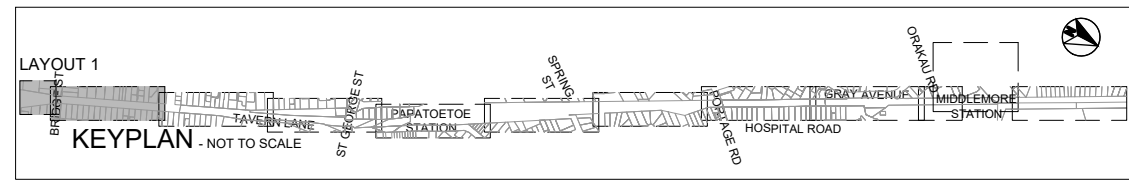
LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- PROPOSED BOUNDARY
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- ACG
TTC
T OVERHEAD LINE EQUIPMENT (OLE)
- WALL
- EARTHWORKS EXTENT - CUT
- EARTHWORKS EXTENT - FILL
- SIDE DRAIN
- EXTENT OF WORKS

300 mm
200
100
50
10 mm
0



85% ISSUE



1:500 @ A1
1:1000 @ A3
0 5 10 15 20 25 30 35 40 45 50 m

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76725
Manukau 2241
New Zealand

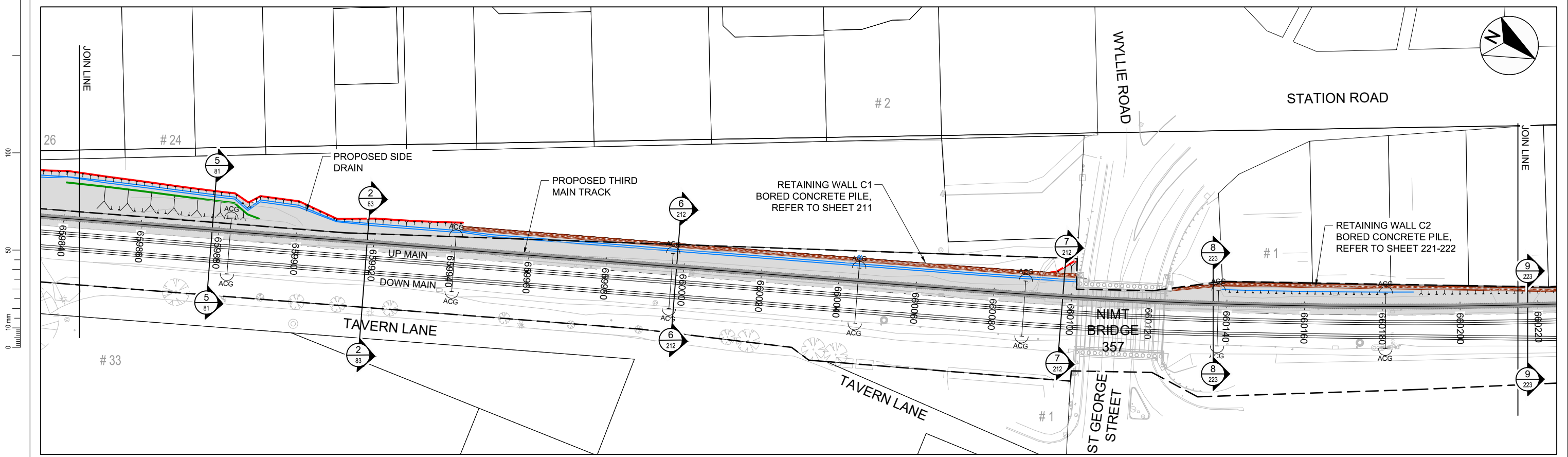
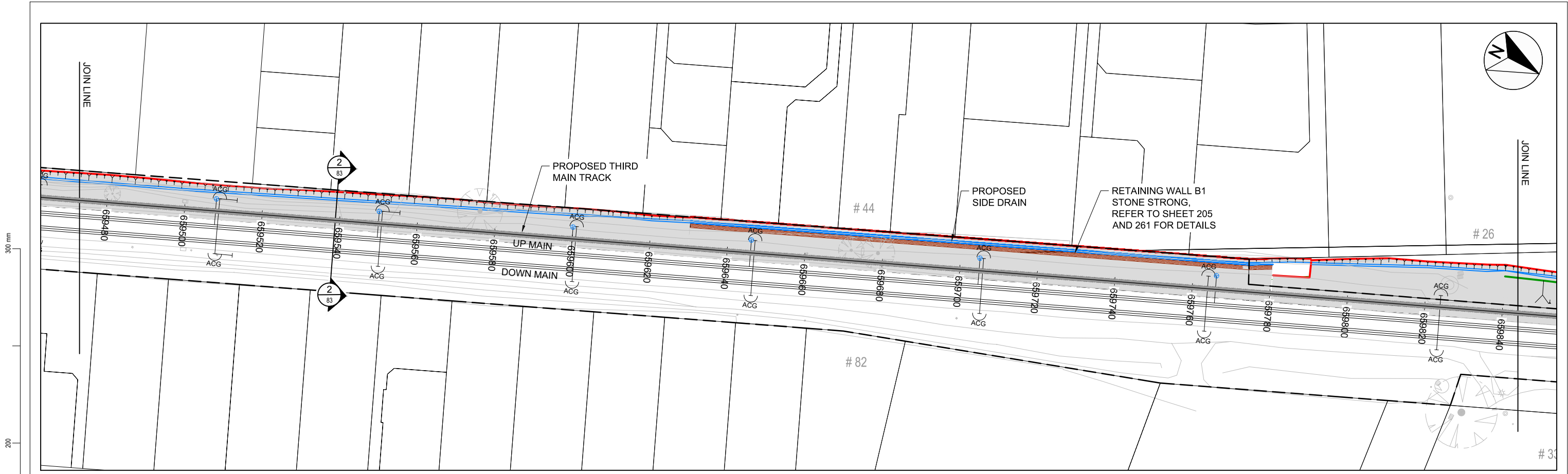
Drawn N.BOYTE	Designed A.COOK	Approved T.WILSON	Revision Date 12.04.12
------------------	--------------------	----------------------	---------------------------

Project No. 1-M9001.86
Scale 1:500 @ A1

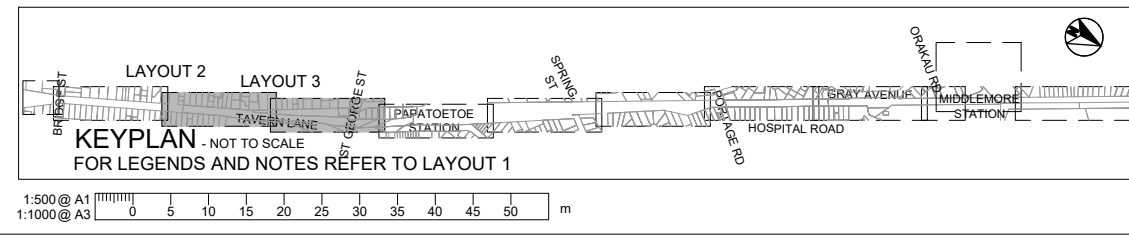
Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
CIVIL SITE PLAN
LAYOUT 2 OF 8

Drawn No. 1/6057/19/5104	Sheet No. 71	Revision RF
-----------------------------	-----------------	----------------



85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76725
Manukau 2241
New Zealand

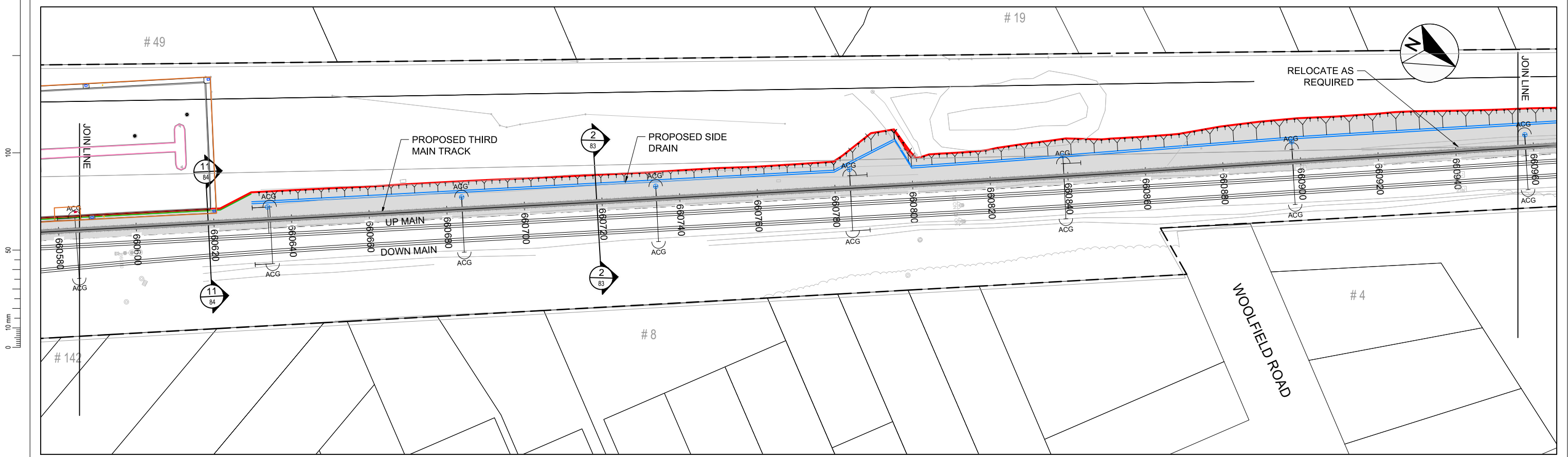
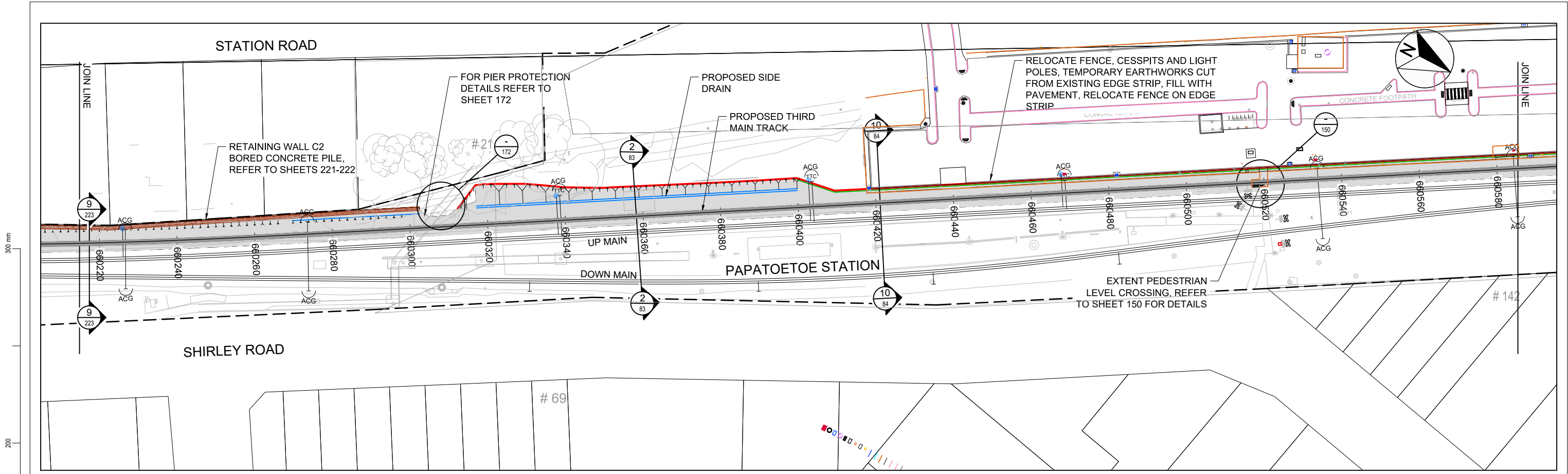
Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12

Project No. 1-M9001.86
Scale 1:500 @ A1

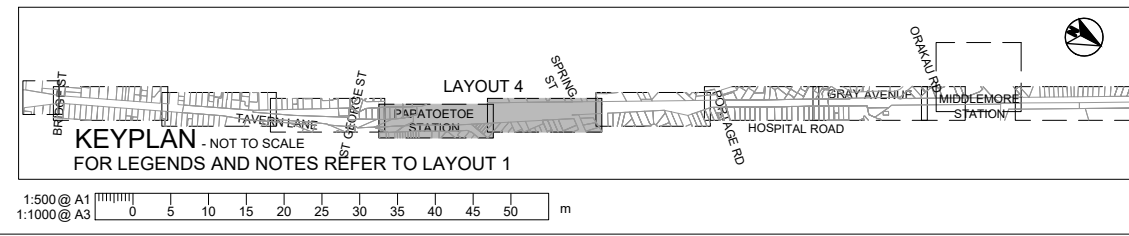
Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet No. 72
Revision RF

Drawing No. 1/6057/19/5104



85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76725
Manukau 2241
New Zealand

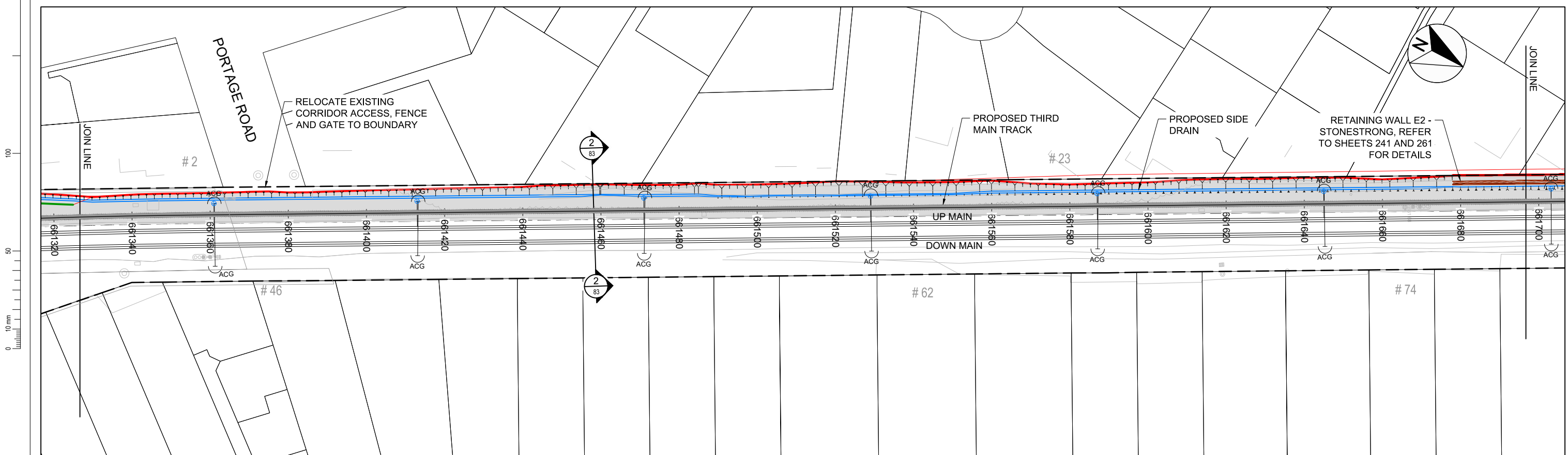
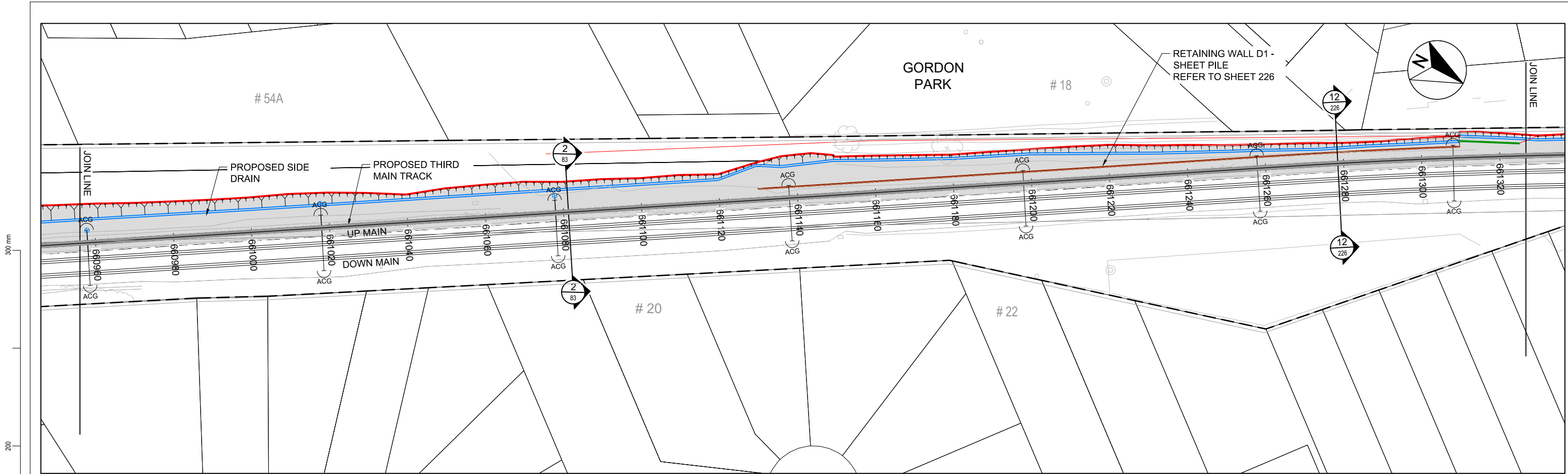
Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12

Project No. 1-M9001.86
Scale 1:500 @ A1

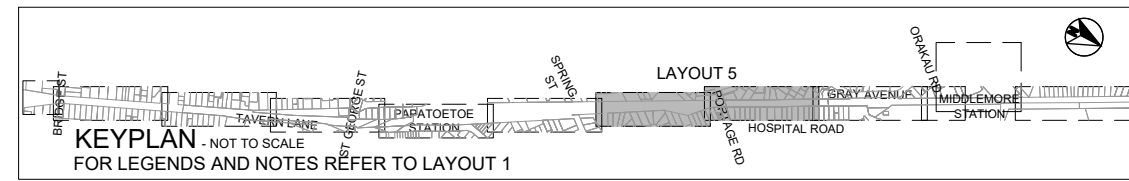
Project
KIWI RAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
CIVIL SITE PLAN
LAYOUT 4 OF 8

Drawn No.	Sheet No.	Revision
1/6057/19/5104	73	RF



85% ISSUE



1:500 @ A1
1:1000 @ A3

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland South
+64 9 263 2500

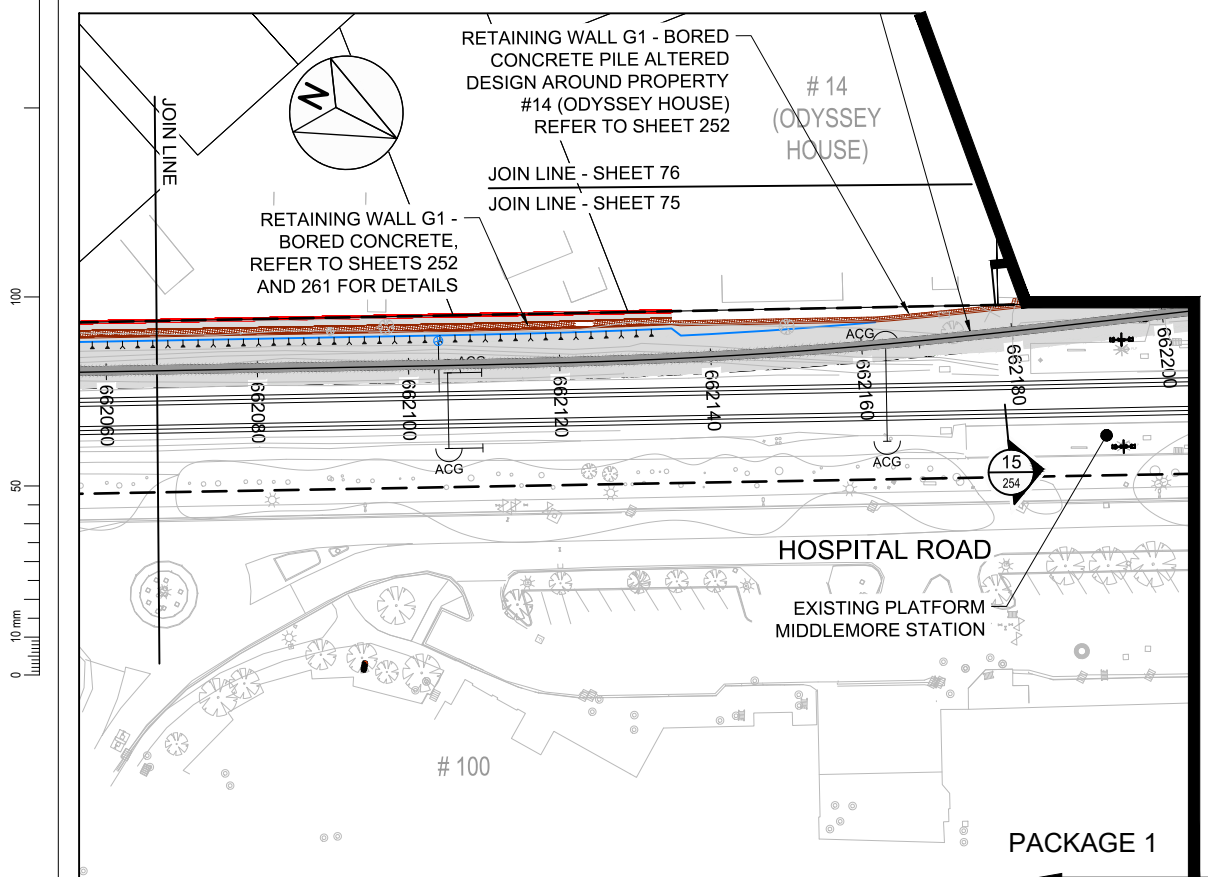
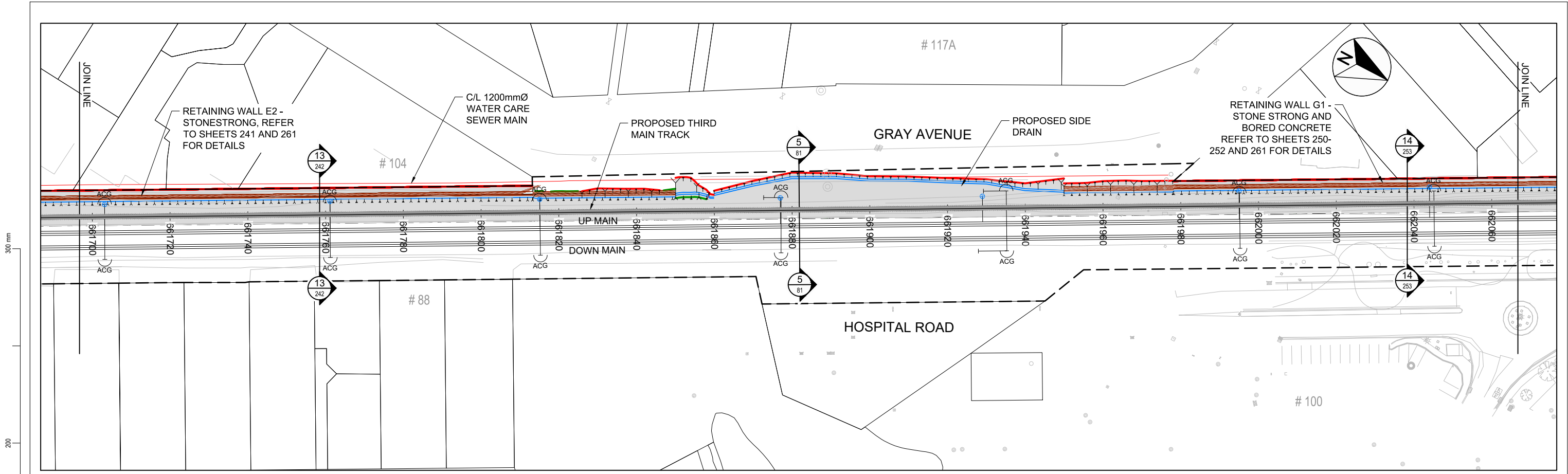
PO Box 76725
Manukau 2241
New Zealand

Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12
Project No.	Scale	Drawing No.	Sheet No.
1-M9001.86	1:500 @ A1	1/6057/19/5104	74

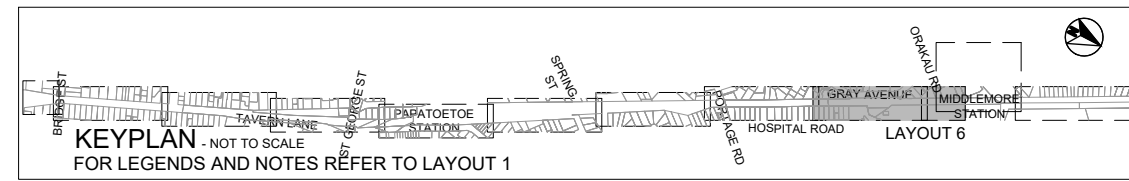
Project
KIWI RAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
CIVIL SITE PLAN
LAYOUT 5 OF 8

Revision	RF
----------	----



NOTE:
LAYOUT 7 CONTAINS
MIDDLEMORE STATION
(MIDDLEMORE PACKAGE 2 - ISSUED
SEPARATELY)



Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	19.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland South
+64 9 263 2500

PO Box 76725
Manukau 2241
New Zealand

Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12

Project No. 1-M9001.86
Scale 1:500 @ A1

Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
CIVIL SITE PLAN
LAYOUT 6 OF 8

Drawn No.	Sheet No.	Revision
1/6057/19/5104	75	RF

85% ISSUE

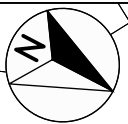
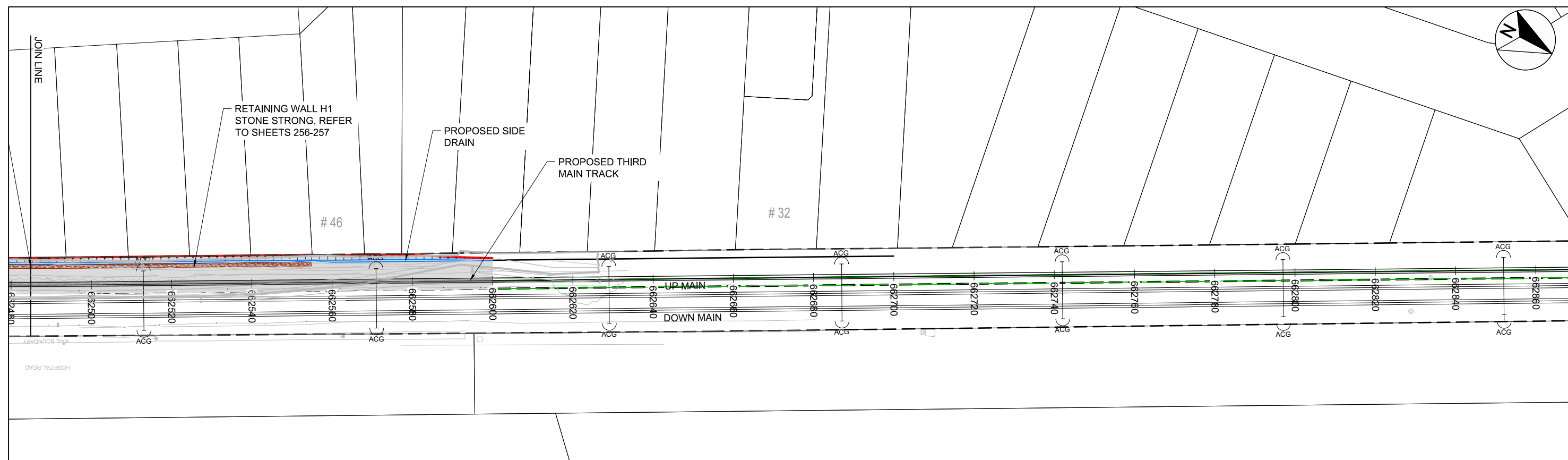
NOTES:

1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL SPECIFICATION
2. FOR ADDITIONAL DESIGN INFORMATION AROUND MIDDLEMORE STATION, REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL, AND STRUCTURAL DRAWINGS
3. FOR STORMWATER DESIGN INFORMATION REFER TO PLANS 300-327

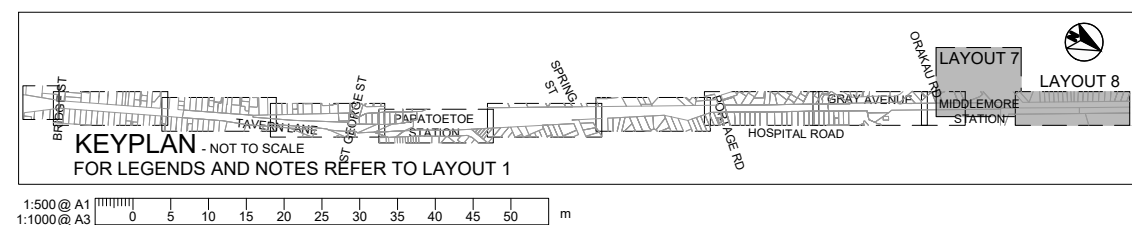
LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- - - - PROPOSED BOUNDARY
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- ACG / TTT / T OVERHEAD LINE EQUIPMENT (OLE)
- WALL
- EARTHWORKS EXTENT - CUT
- EARTHWORKS EXTENT - FILL
- SIDE DRAIN
- EXTENT OF WORKS

300 mm
200
100
50
10 mm
0



85% ISSUE



1:500 @ A1
1:1000 @ A3

Revision	Amendment	Approved	Revision Date
RA	MIDDLEMORE OPTION 4 CONCEPT	TW	11.05.12
RB	MIDDLEMORE PRELIMINARY DESIGN	TW	20.06.12
RC	85% ISSUE	PW	19.07.16
RD	85% ISSUE UPDATED	PW	08.11.16



PO Box 76725
Manukau 2241
New Zealand

Drawn	Designed	Approved	Revision Date
VARIOUS	VARIOUS	T.WILSON	11.05.12

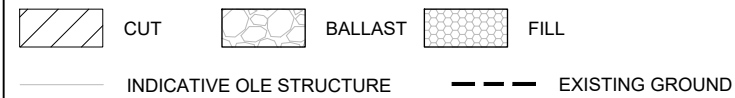
Project No. 1-M9001.86 Scale 1:500 @ A1

Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
CIVIL SITE PLAN LAYOUT 8 OF 8	
Drawing No.	Sheet No.
1/6057/19/5104	77
Revision	RD

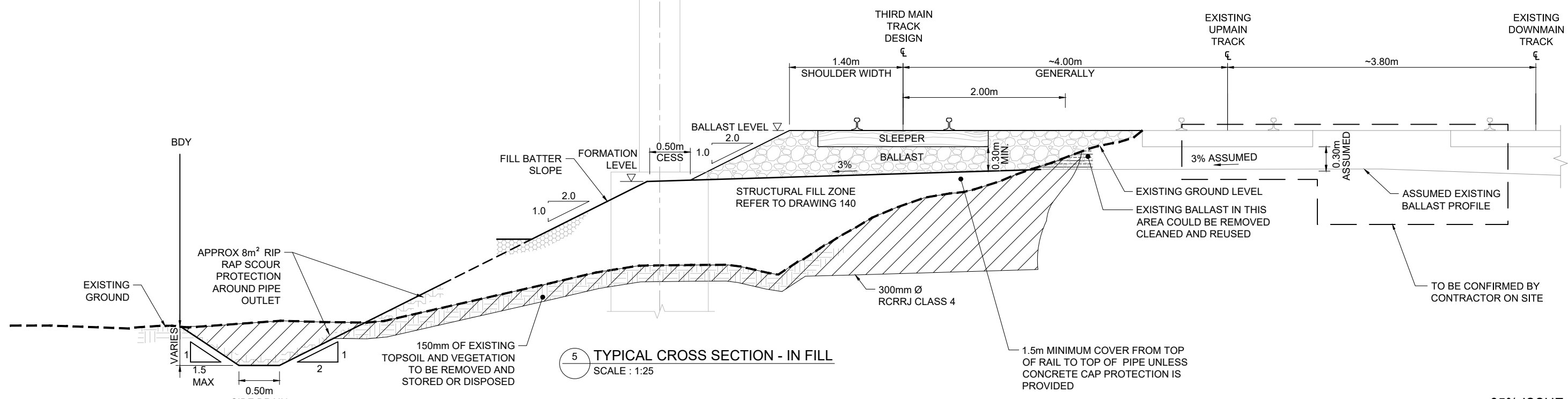
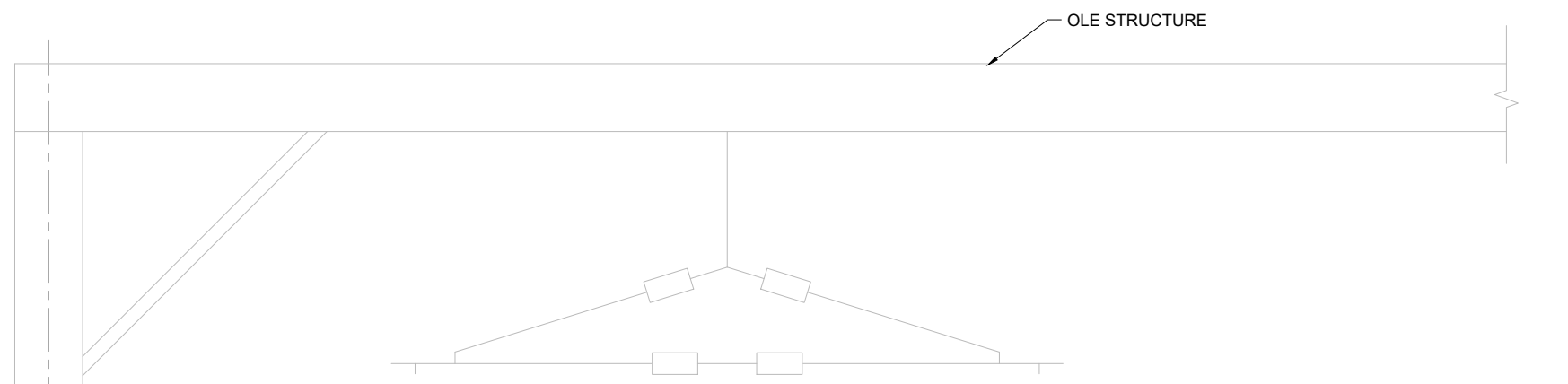
NOTES:

1. GEOTECHNICAL SUPERVISION BY A SUITABLY QUALIFIED ENGINEER, WILL BE REQUIRED DURING THE CONSTRUCTION OF THE STRUCTURAL FILL ZONE TO DETERMINE APPROPRIATE DEPTHS AND MATERIALS
2. FOR CLARITY RAILS ARE SHOWN LEVEL, MINIMUM DIMENSIONS STILL
3. APPLY ON CURVES
4. TYPICAL DETAIL IS GENERATED FROM ONTRACK FORMATION GUIDELINES AND T:200 SPECIFICALLY CLAUSES 211 & 404
5. NEW SLEEPERS ASSUMED TO BE TIMBER 150mm W x 200mm D x 2100 L
6. GAUGE 1068mm, NO ACCOUNT FOR WIDENING OF CURVES SHOWN
7. TOP OF STRUCTURAL FILL ZONE REQUIRES A CBR OF 15%
8. BALLAST MATERIAL SUBJECT TO KIWIRAIL APPROVAL
9. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAILS RAIL SAFETY STANDARDS AND GUIDELINES
10. REFER TO SHEET 140 FOR STRUCTURAL FILL ZONE DETAILS

LEGEND:

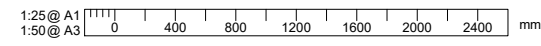


300 mm
200
100
50
10 mm
0



5 TYPICAL CROSS SECTION - IN FILL
SCALE : 1:25

85% ISSUE



Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	16.12.16

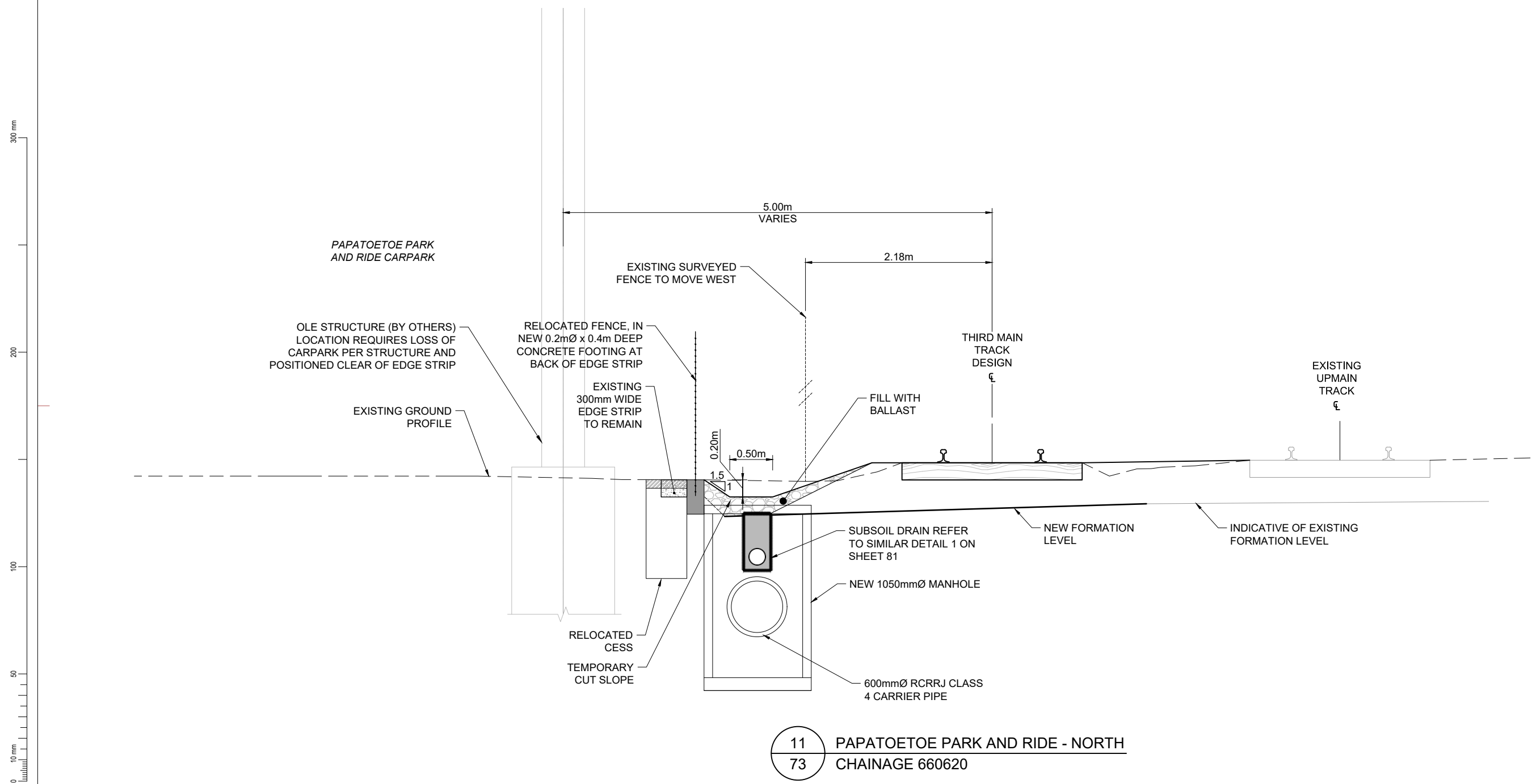


Drawn	Designed	Approved	Revision Date
N.BOYTE	VARIOUS	T.WILSON	07.05.12
Project No.	Scale		
1-M9001.86	1:25 @ A1		

Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
TYPICAL SECTIONS LAYOUT 1 OF 3	
Drawing No.	Revision
1/6057/19/5104	81 RC

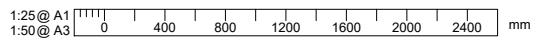
NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAIL
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY



11 PAPATOETOE PARK AND RIDE - NORTH
73 CHAINAGE 660620

85% ISSUE

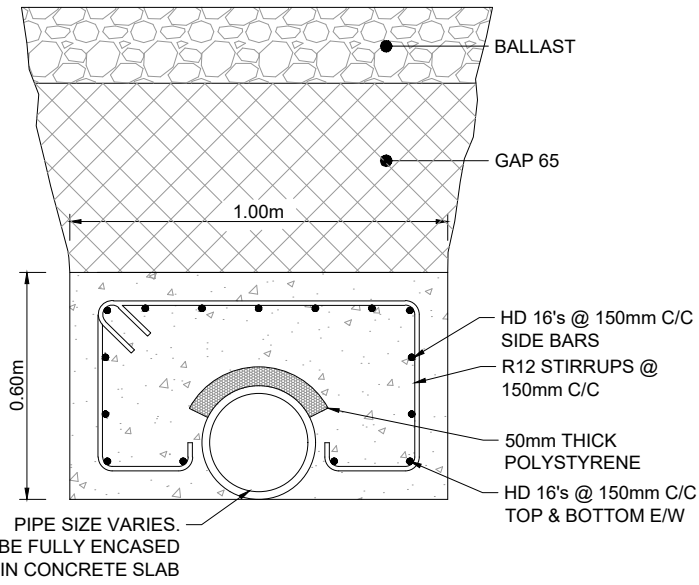


Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	AMENDED TITLE FOR OPW ISSUE	TW	30.05.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	16.12.16

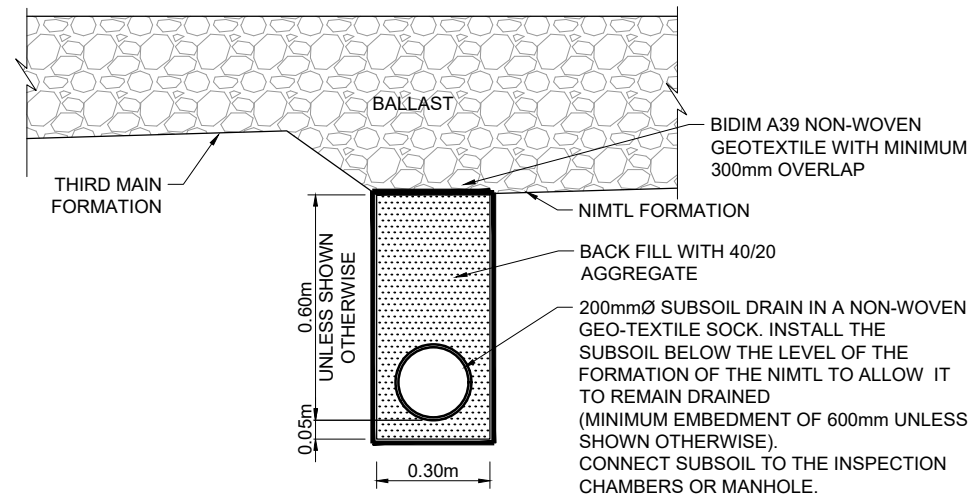
			Auckland Office PO Box 5848 Auckland 1141, New Zealand + 64 9 355 9500		Project KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2
			Drawn: A. COOK Designed: VARIOUS Approved: T. WILSON Revision Date: 07.05.12		Sheet TYPICAL SECTIONS LAYOUT 3 OF 3
Project No.: 1-M9001.86		Scale: 1:25 @ A1		Drawing No.: 1/6057/19/5104	
				Sheet No.: 84	Revision: RD

NOTES:

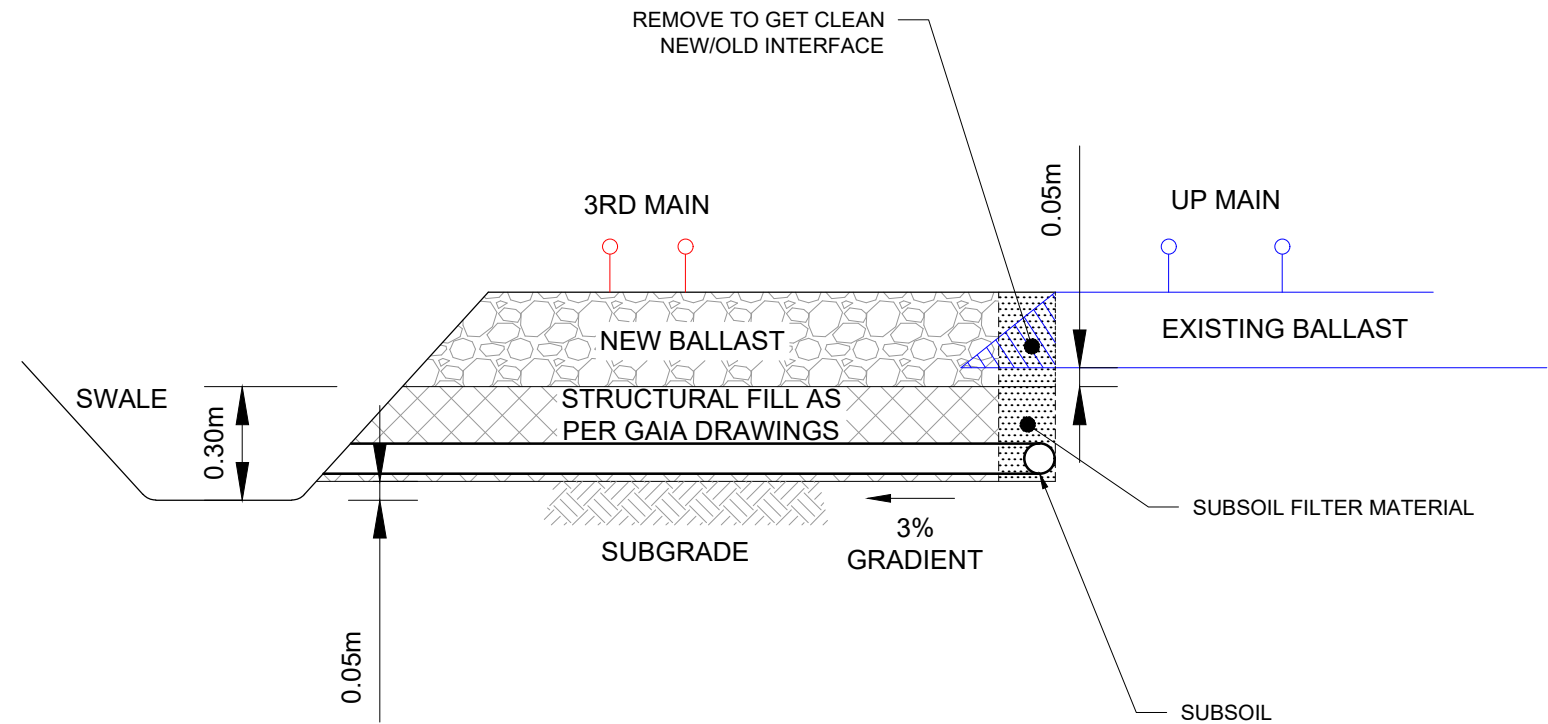
1. REFER TO SHEETS 301 - 306 FOR PROPOSED DRAINAGE LAY OUT.
2. REFER TO SHEET 140 FOR GAIA STANDARD DETAILS.



1 DETAIL - TYPICAL PIPE PROTECTION DETAIL (COVER <1.5m T.O.R.)
SCALE: 1:10

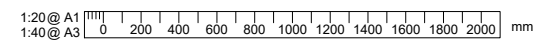


1 DETAIL - SUBSOIL DRAIN
SCALE: 1:10



TYPICAL LOCALISED SUBSOIL TREATMENT FOR AREAS WITH DRAINAGE PROBLEM

85% ISSUE



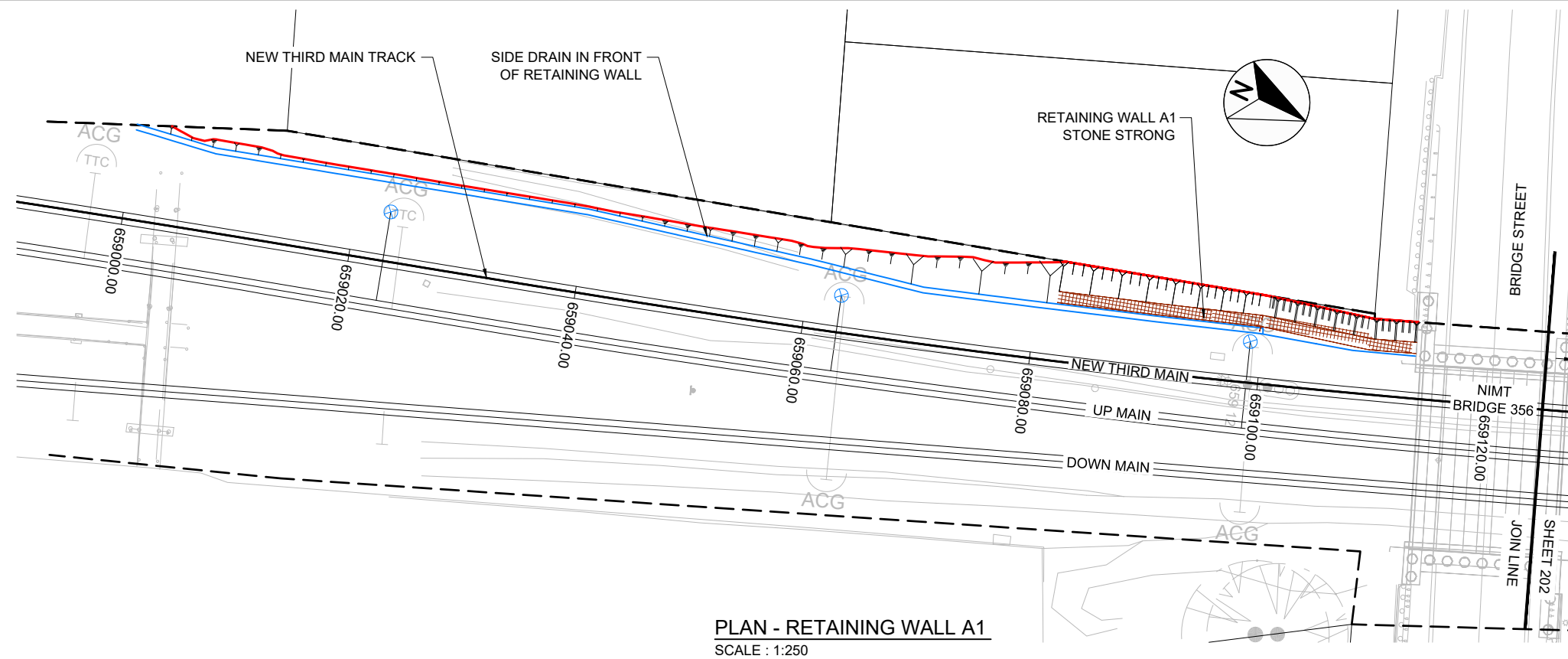
Revision	Amendment	Approved	Revision Date
RA	85% ISSUE	PW	16.12.16



Drawn	Designed	Approved	Revision Date
D CONLON	P WILLEY		

Project No.	Scale
1-M9001.86	1:10 @ A1

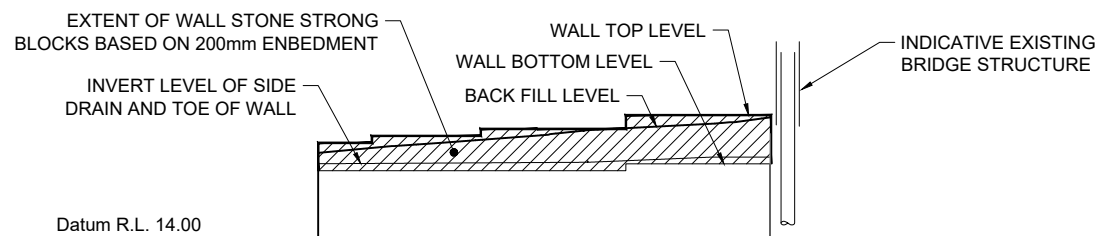
Project	
KIWI RAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
TYPICAL LOCALISED SUB SOIL TREATMENT	
Sheet No.	Revision
88	RA



LEGEND:

- LEGAL BOUNDARIES
- - - RAIL BOUNDARIES
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG TTC OLE AS BUILT LOCATION
- SIDE DRAIN
- STONE STRONG WALL

PLAN - RETAINING WALL A1
SCALE : 1:250



Datum R.L. 14.00

TOP OF WALL LEVEL	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00
BACK FILL LEVEL	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
TOE OF WALL LEVEL	18.96	18.97	18.98	18.99	19.00	19.01	19.02	19.03	19.05	19.06	19.14	19.23	19.31	19.39	19.39	19.40
BOTTOM OF WALL LEVEL	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
WALL INFORMATION	← STONE STRONG BLOCKS, AT LEAST 200mm EMBEDMENT →															
	2x24SF		2x24SF + 1x6SF				3x24SF				3x24SF + 1x6SF					
WALL STATION	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00
RAIL CHAINAGE	659082					659092					659102					659112

Wall A1 Part 0
SECTION BETWEEN CH: 0.00 AND 30.00
1xVERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL A1
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	DETAILED DESIGN ISSUE	GE	06.07.12
RB	85% ISSUE	PW	20.07.16
RC	WALL STRUCTURE CHANGED TO STONE WALL	PW	08.11.16



OPUS
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

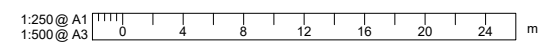
Drawn	Designed	Approved	Revision Date
A. COOK	DARRELL O	G. EAST	06.07.12
Project No.	Scale	Drawing No.	
1-M9001.86	1:250 @ A1	1/6057/19/5104	

Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
RETAINING WALL A1
PLAN AND LONG SECTION LAYOUT 1 OF 3

Sheet No.	Revision
200	RC

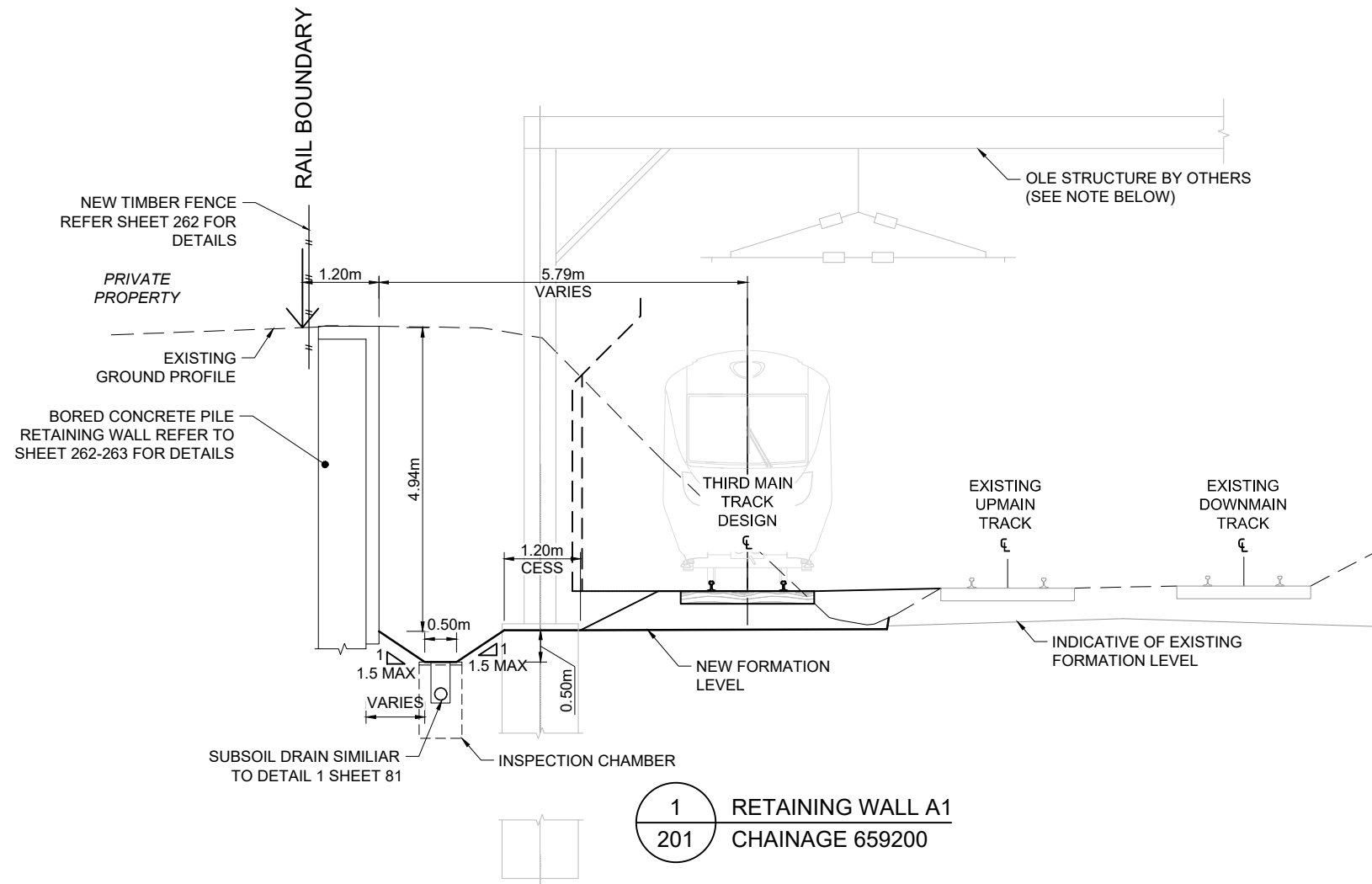
85% ISSUE



NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN

300 mm
200
100
50
0 10 mm



NOTE:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR CONSENT	TW	03.07.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	20.07.16
RD	85% ISSUE UPDATED	PW	10.11.16



Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Drawn	Designed	Approved	Revision Date
A.COOK	VARIOUS	T.WILSON	03.07.12

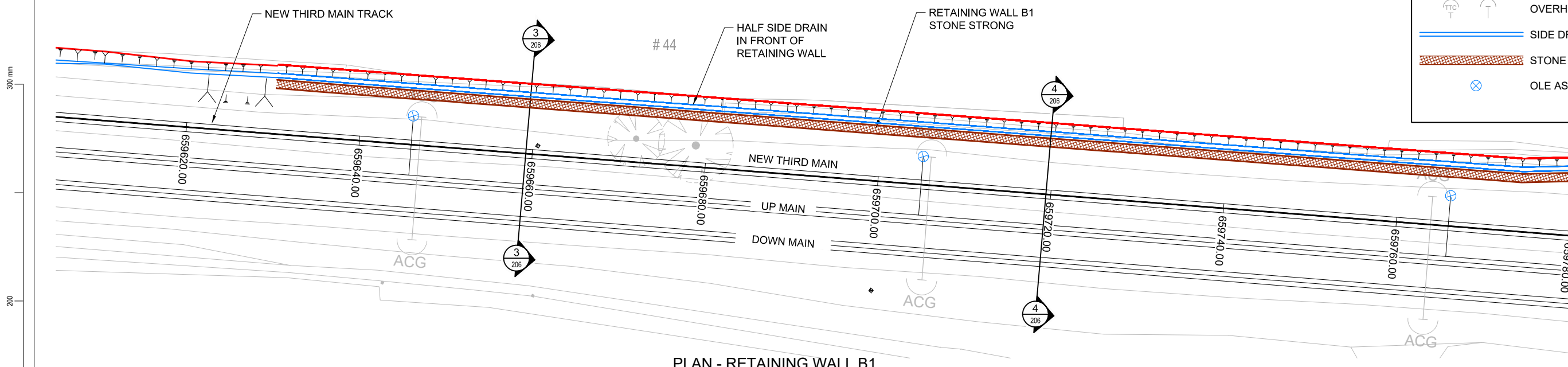
Project No.	Scale
1-M9001.86	1:50 @ A1

Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
RETAINING WALL A1 SECTION	
Sheet No.	Revision
203	RD

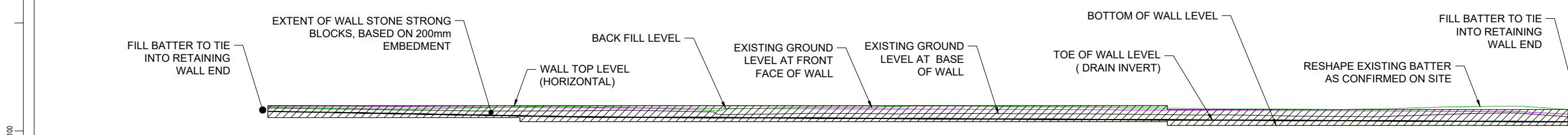
1:50 @ A1
1:100 @ A3



LEGEND:	
	LEGAL BOUNDARIES
	RAIL BOUNDARIES
	SURVEY
	EXISTING TRACK
	NEW THIRD MAIN
	EARTHWORKS - CUT
	OVERHEAD LINE EQUIPMENT (OLE)
	SIDE DRAIN
	STONE STRONG WALL
	OLE AS BUILT LOCATION



PLAN - RETAINING WALL B1
SCALE : 1:250



Datum R.L. 10.00																																																																												
TOP OF WALL LEVEL	17.16	17.15	17.20	17.13	17.20	17.20	17.11	17.20	17.20	17.20	17.20	17.20																																																																
BACK FILL LEVEL	16.54	16.50	16.47	16.43	16.40	16.36	16.33	16.30	16.26	16.22	16.18	16.15																																																																
TOE OF WALL LEVEL	16.54	16.50	16.47	16.43	16.40	16.36	16.33	16.30	16.26	16.22	16.18	16.15																																																																
BOTTOM OF WALL LEVEL	15.82	15.82	15.82	15.82	15.82	15.82	15.82	15.82	15.82	15.82	15.82	15.82																																																																
WALL INFORMATION	1 x 24SF + 1 x 6SF STONE STRONG BLOCKS AT LEAST 200mm EMBEDMENT					2 x 24SF STONE STRONG BLOCKS, AT LEAST 200mm EMBEDMENT																																																																						
WALL STATION	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00	42.00	44.00	46.00	48.00	50.00	52.00	54.00	56.00	58.00	60.00	62.00	64.00	66.00	68.00	70.00	72.00	74.00	76.00	78.00	80.00	82.00	84.00	86.00	88.00	90.00	92.00	94.00	96.00	98.00	100.00	102.00	104.00	106.00	108.00	110.00	112.00	114.00	116.00	118.00	120.00	122.00	124.00	126.00	128.00	130.00	132.00	134.00	136.00	138.00	140.00	142.00	144.00	146.00	148.00	150.00
RAIL CHAINAGE	659630													659780																																																														

B1_Bottom
SECTION BETWEEN CH: 0.00 AND 150.00
1 x VERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL B1
SCALE : 1:250

85% ISSUE

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	85% ISSUE	PW	20.07.16
RB	85% UPDATED	PW	08.11.16

OPUS
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+64 9 355 9500

Project
KIWI RAIL
MIDDLEMORE (662,600m) TO PUHUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
RETAINING WALL B1
PLAN AND LONG SECTION

Drawn
A. COOK

Design
DARRELL O

Approved
PAUL WILLEY

Revision Date
20.07.16

Project No.
1-M9001.86

Scale
1:250 @ A1

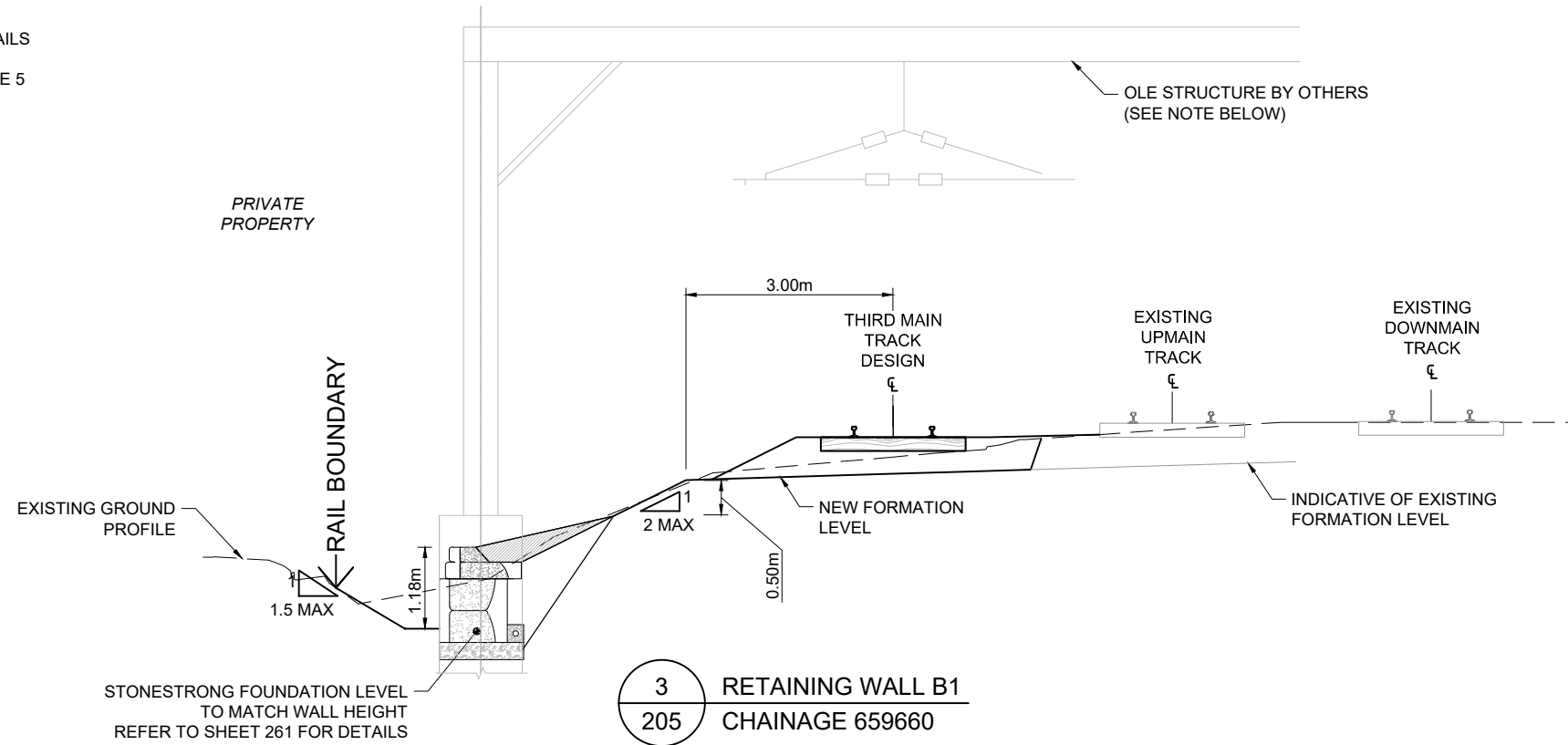
Drawn No.
1/6057/19/5104

Sheet No.
205

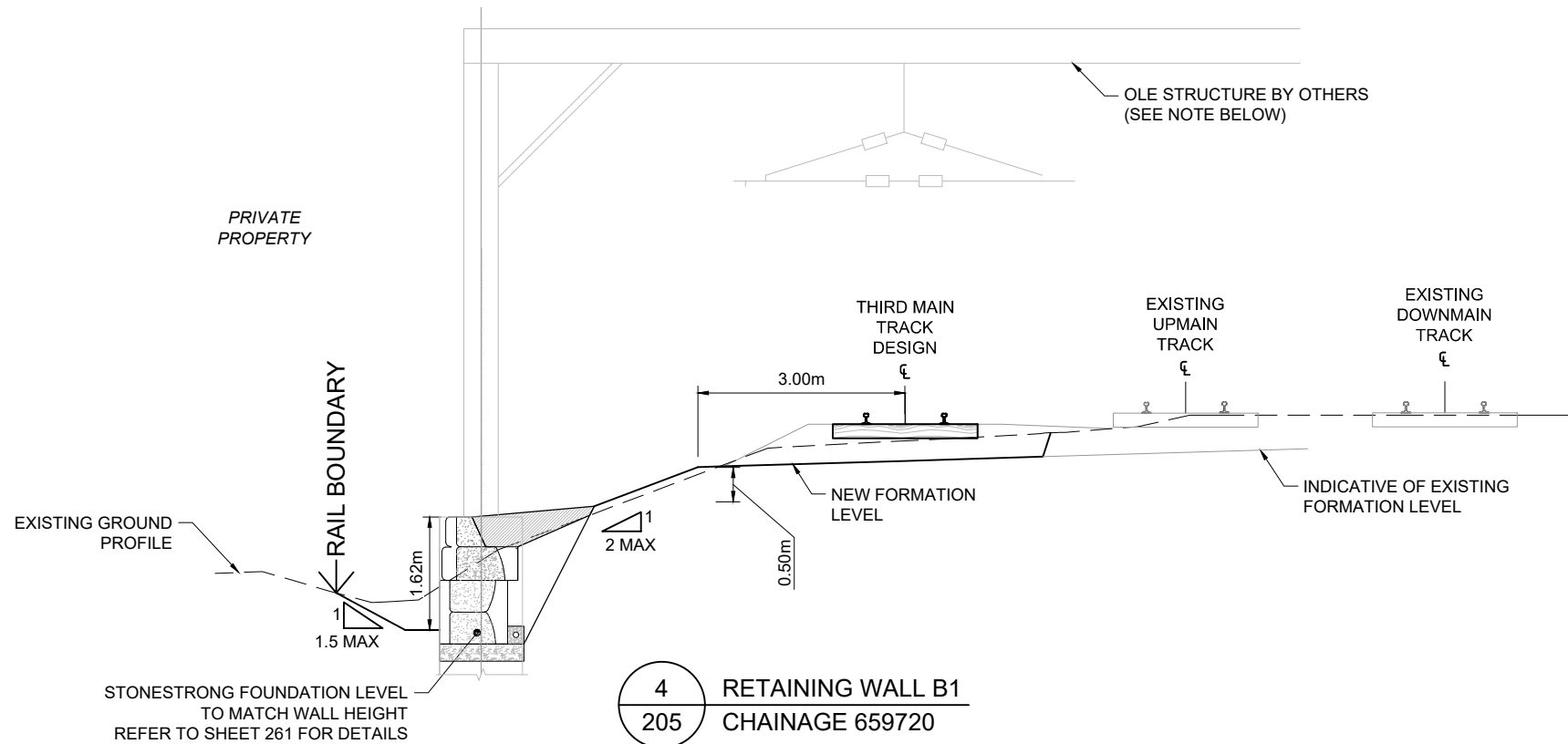
Revision
RB

NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



3 RETAINING WALL B1
205 CHAINAGE 659660



4 RETAINING WALL B1
205 CHAINAGE 659720

85% ISSUE

NOTE:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR CONSENT	TW	03.07.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	20.07.16
RD	85% ISSUE UPDATED	PW	10.11.16



Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

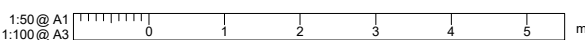
Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Drawn	Designed	Approved	Revision Date
A. COOK	VARIOUS	T. WILSON	03.07.12

Project No.	Scale
1-M9001.86	1:50 @ A1

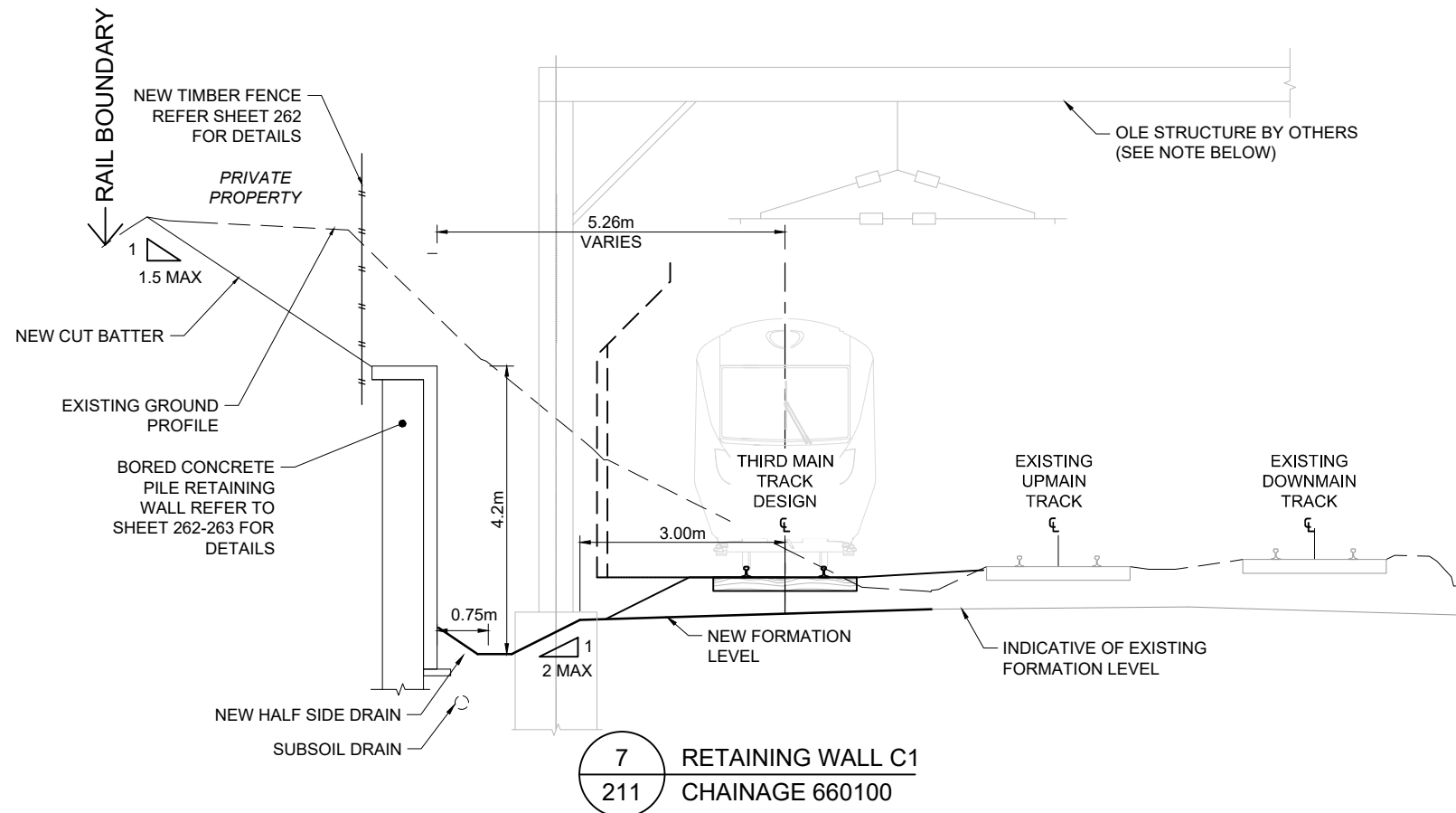
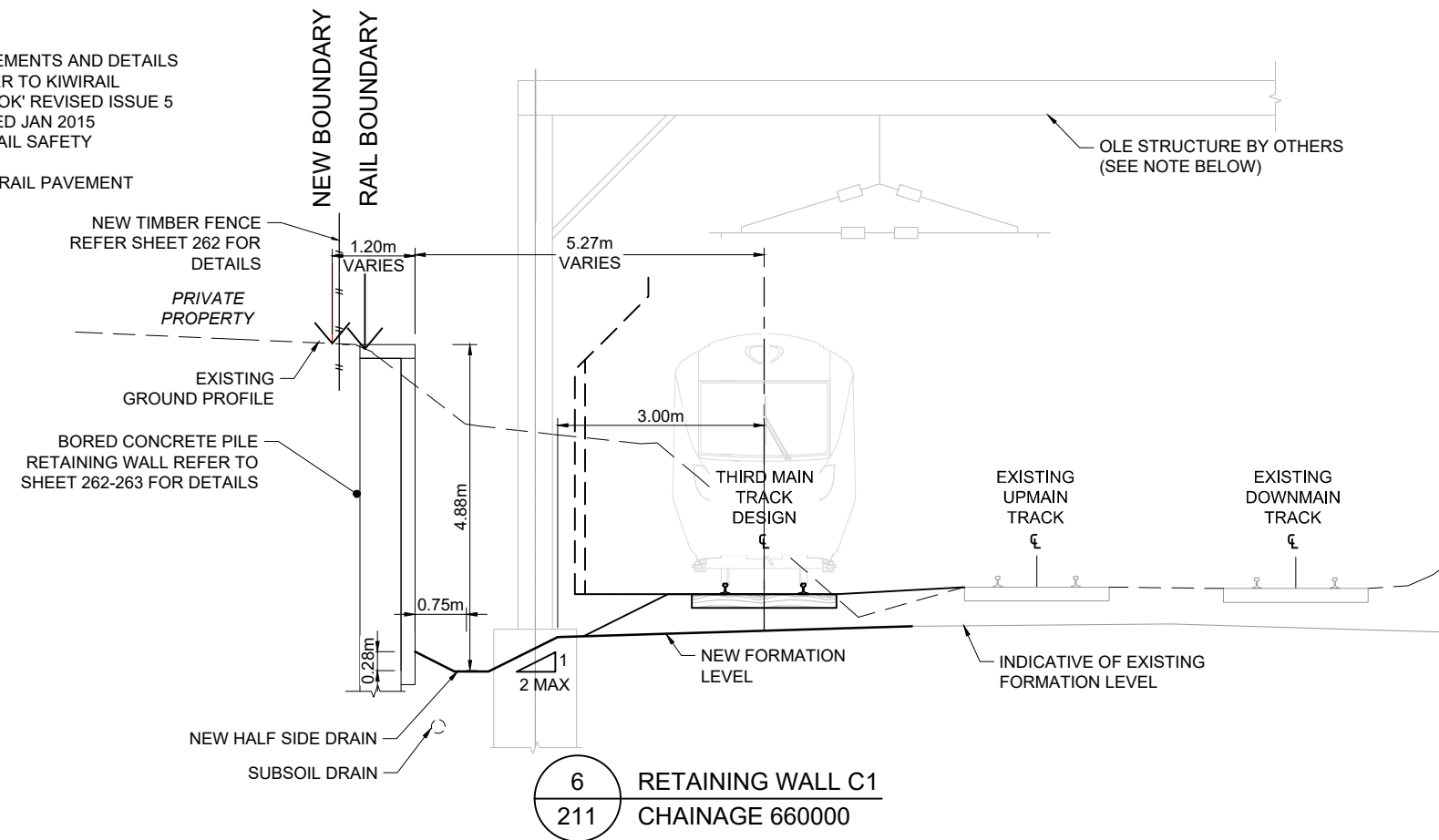
Sheet
RETAINING WALL B1
SECTION

Drawing No.	Sheet No.	Revision
1/6057/19/5104	206	RD



NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWRIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWRIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWRIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



85% ISSUE

NOTE:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	AMENDED TITLE FOR OPW ISSUE	TW	30.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	20.07.16
RF	85% ISSUE UPDATED	PW	10.11.16



Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

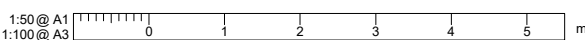
Project
KIWRIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Drawn	Designed	Approved	Revision Date
A. COOK	VARIOUS	T. WILSON	07.05.12

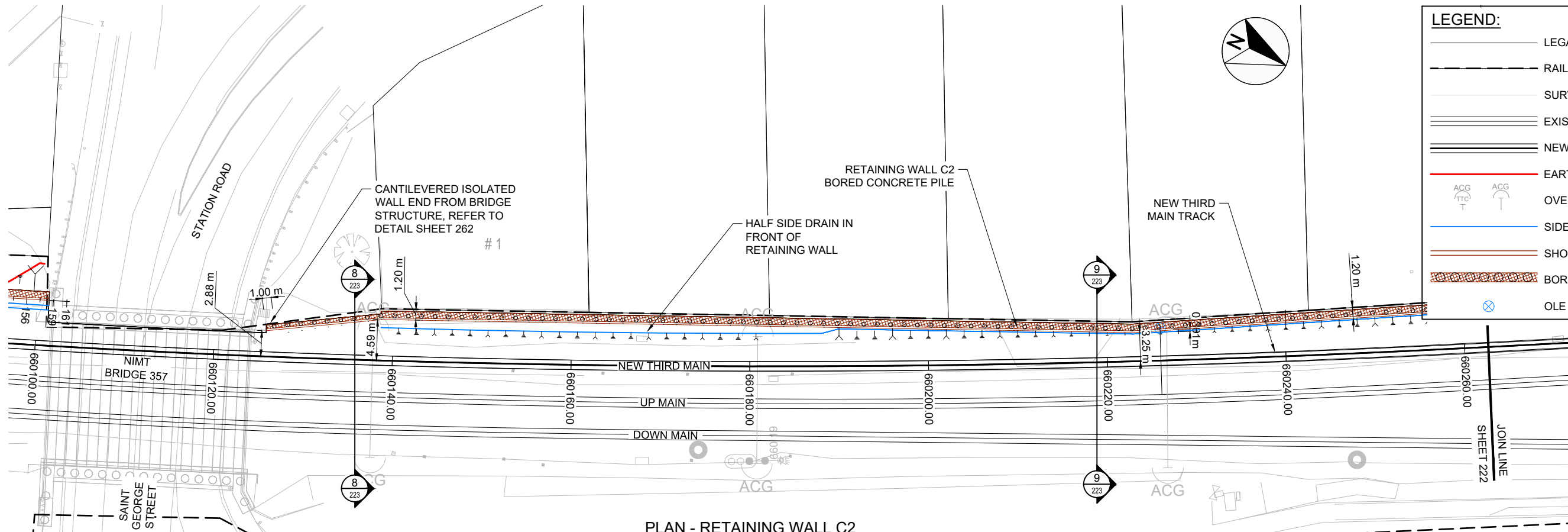
Project No.	Scale
1-M9001.86	1:50 @ A1

Sheet
RETAINING WALL C1
SECTIONS

Drawing No.	Sheet No.	Revision
1/6057/19/5104	212	RF



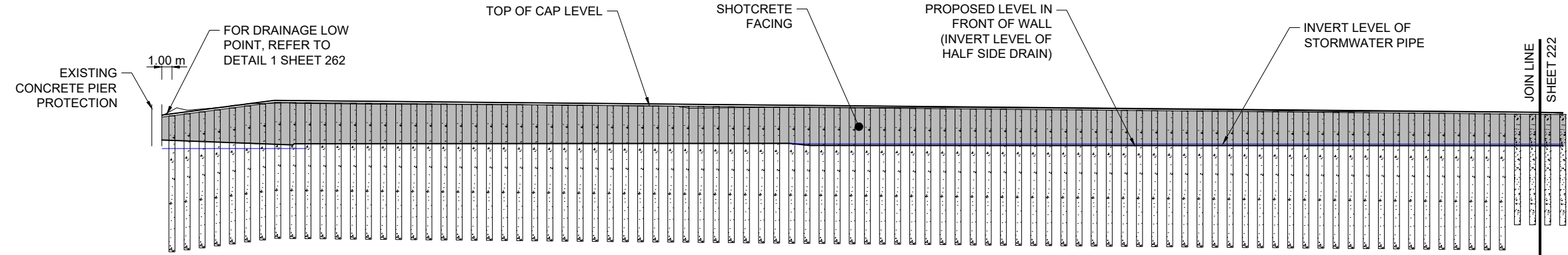
300 mm
200
100
50
0 10 mm



LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- SHOT-CRETE FACING PANEL
- ▨ BORED CONCRETE PILE WALL
- ⊗ OLE AS BUILT LOCATION

PLAN - RETAINING WALL C2
SCALE : 1:250



DATUM R.L. 4.00	
TOP OF CAP LEVEL	18.20 21.19 18.15 21.21 18.09 21.33 18.03 21.46 17.98 21.67 17.92 21.84 17.86 21.87 17.81 21.90 17.75 21.89 17.68 21.87 17.68 21.85 17.68 21.84 17.68 21.82 17.68 21.81 17.68 21.80 17.68 21.79 17.68 21.79 17.68 21.78 17.68 21.78 17.68 21.77 17.68 21.76 17.68 21.76 17.90 21.74 17.90 21.72 17.90 21.71 17.90 21.70 17.90 21.68 17.90 21.67 17.90 21.65 17.90 21.64 17.91 21.62 17.91 21.61 17.91 21.46 17.91 21.41 17.91 21.43 17.91 21.45 17.91 21.46 17.91 21.48 17.91 21.49 17.88 21.49 17.74 21.50 17.72 21.49 17.72 21.49 17.71 21.48 17.71 21.48 17.71 21.48 17.71 21.48 17.71 21.49 17.71 21.48 17.71 21.47 17.71 21.46 17.71 21.45 17.71 21.43 17.71 21.43 17.71 21.42 17.71 21.40 17.71 21.39 17.70 21.37 17.70 21.36 17.70 21.34 17.70 21.33 17.70 21.31 17.70 21.30 17.70 21.28 17.70 21.26 17.70 21.25 17.70 21.23 17.70 21.21 17.70 21.19 17.70 21.17 17.70 21.15 17.70 21.13 17.69 21.11 17.69 21.09 17.69 21.07 17.69 21.08 17.69 21.08 17.69 21.07 17.69 21.06 17.69 21.06 17.69 21.05 17.69 21.04 17.69 21.02 17.69 21.02 17.69 21.01 17.68 21.00 17.68 20.96
FORMATION LEVEL	18.20 21.19 18.15 21.21 18.09 21.33 18.03 21.46 17.98 21.67 17.92 21.84 17.86 21.87 17.81 21.90 17.75 21.89 17.68 21.87 17.68 21.85 17.68 21.84 17.68 21.82 17.68 21.81 17.68 21.80 17.68 21.79 17.68 21.79 17.68 21.78 17.68 21.78 17.68 21.77 17.68 21.76 17.68 21.76 17.90 21.74 17.90 21.72 17.90 21.71 17.90 21.70 17.90 21.68 17.90 21.67 17.90 21.65 17.90 21.64 17.91 21.62 17.91 21.61 17.91 21.46 17.91 21.41 17.91 21.43 17.91 21.45 17.91 21.46 17.91 21.48 17.91 21.49 17.88 21.49 17.74 21.50 17.72 21.49 17.72 21.49 17.71 21.48 17.71 21.48 17.71 21.48 17.71 21.48 17.71 21.49 17.71 21.48 17.71 21.47 17.71 21.46 17.71 21.45 17.71 21.43 17.71 21.43 17.71 21.42 17.71 21.40 17.71 21.39 17.70 21.37 17.70 21.36 17.70 21.34 17.70 21.33 17.70 21.31 17.70 21.30 17.70 21.28 17.70 21.26 17.70 21.25 17.70 21.23 17.70 21.21 17.70 21.19 17.70 21.17 17.70 21.15 17.70 21.13 17.69 21.11 17.69 21.09 17.69 21.07 17.69 21.08 17.69 21.08 17.69 21.07 17.69 21.06 17.69 21.06 17.69 21.05 17.69 21.04 17.69 21.02 17.69 21.02 17.69 21.01 17.68 21.00 17.68 20.96
PILE INFORMATION	13.5m LONG / 600mm Ø TYPE 2 / 1500mm C/C
WALL STATION	-3.00 -1.50 0.00 1.50 3.00 4.50 6.00 7.50 9.00 10.50 12.00 13.50 15.00 16.50 18.00 20.00 22.50 25.50 27.00 30.00 31.50 33.00 34.50 36.00 37.50 39.00 40.50 42.00 43.50 45.00 46.50 48.00 49.50 51.00 52.50 54.00 55.50 57.00 58.50 60.00 61.50 63.00 64.50 66.00 67.50 69.00 70.50 72.00 73.50 75.00 76.50 78.00 79.50 81.00 82.50 84.00 85.50 87.00 88.50 90.00 91.50 93.00 94.50 96.00 97.50 99.00 100.50 102.00 103.50 105.00 106.50 108.00 109.50 111.00 112.50 114.00 115.50 117.00 118.50 120.00 121.50 123.00 124.50 126.00 127.50 129.00 130.50 132.00 133.50 135.00 136.50 138.00
RAIL CHAINAGE	660127.22 660140 660160 660180 660200 660220 660240 660260

RETAINING WALL C2 - PART 1
1x VERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL C2
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	DETAILED DESIGN ISSUE	GE	06.07.12
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	08.11.16

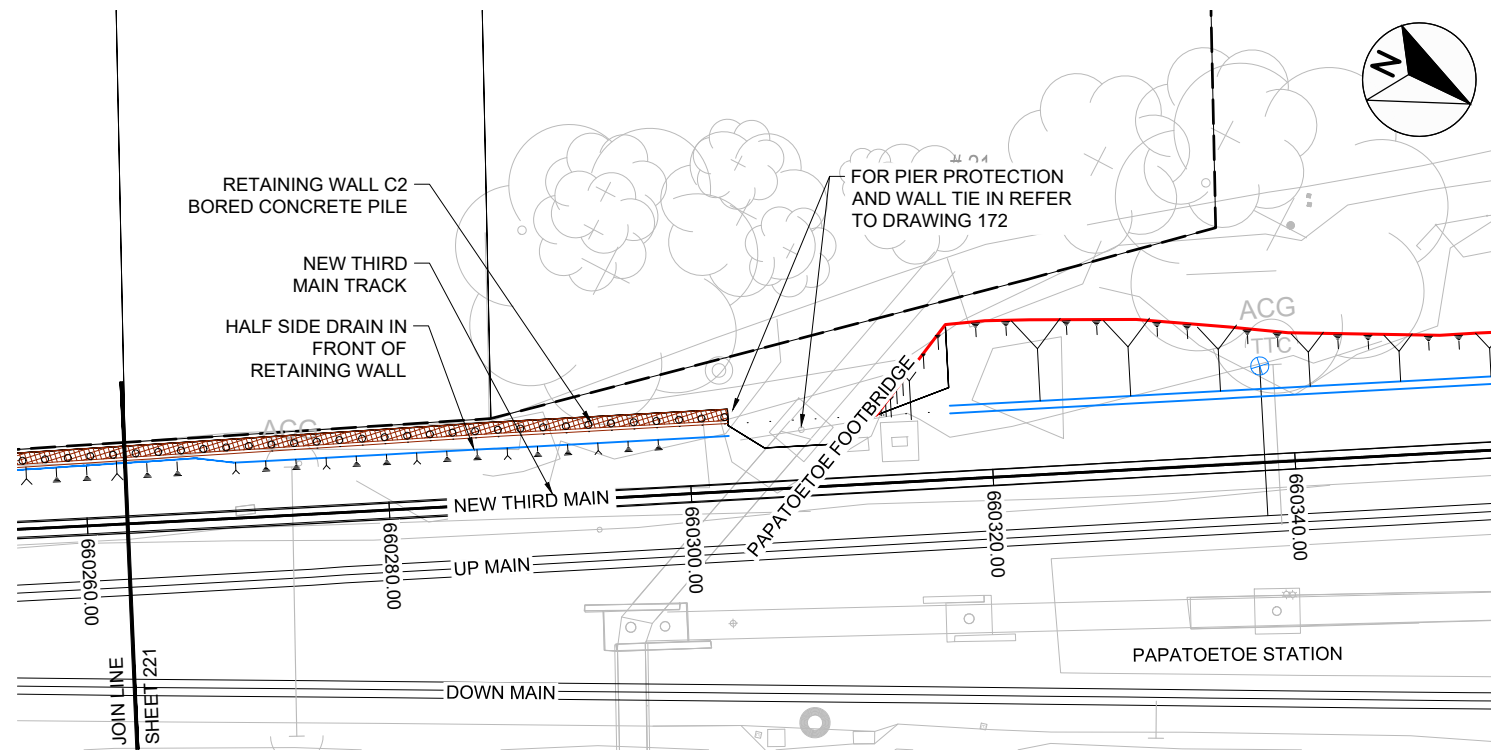
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Project
KIWI RAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

Sheet
RETAINING WALL C2
PLAN AND LONG SECTION LAYOUT 1 OF 2

Drawn A. COOK	Designd DARRELL O	Approved G. EAST	Revision Date 06.07.12
Project No. 1-M9001.86	Scale 1:250 @ A1	Drawing No. 1/6057/19/5104	Sheet No. 221
			Revision RC

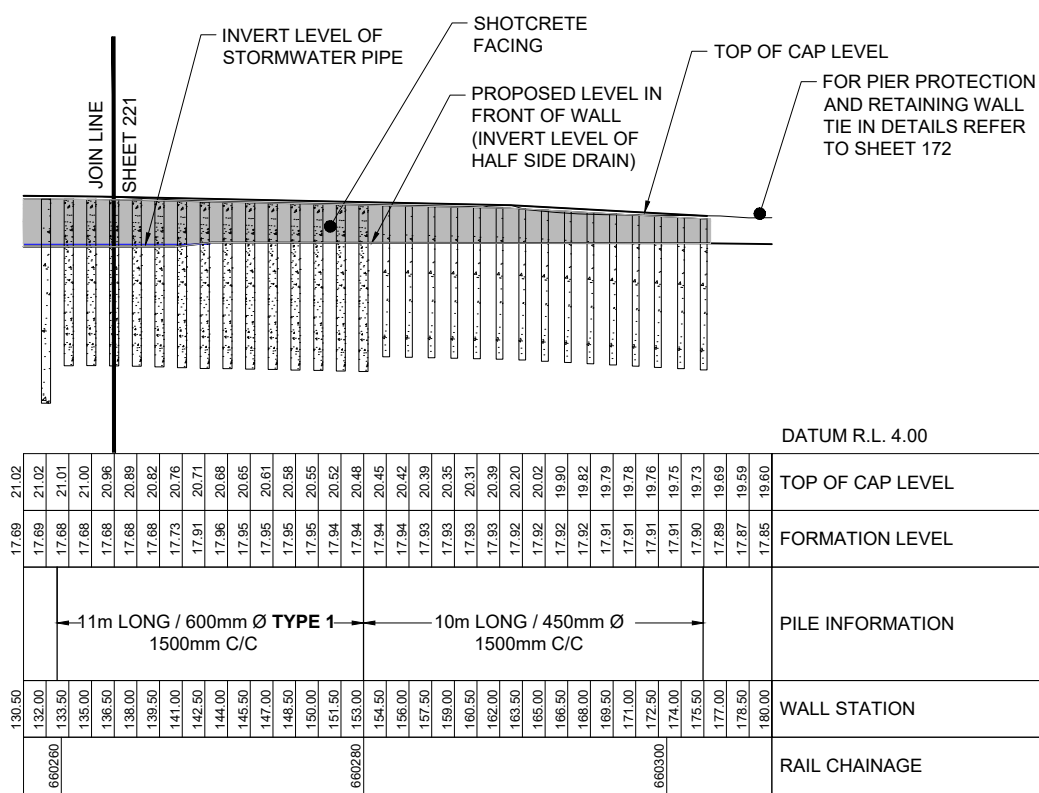
85% ISSUE



LEGEND:

- LEGAL BOUNDARIES
- - - RAIL BOUNDARIES
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG (TTC) OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- SHOT-CRETE FACING PANEL
- ▨ BORED CONCRETE PILE WALL
- ⊗ OLE AS BUILT LOCATION

PLAN - RETAINING WALL C2
SCALE : 1:250



RETAINING WALL C2 - PART 2
1x VERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL C2
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	AMENDED TITLE FOR OPW ISSUE	TW	30.05.12
RC	DETAILED DESIGN ISSUE	GE	06.07.12
RD	85% ISSUE	PW	20.07.16
RE	85% ISSUE UPDATED	PW	08.11.16



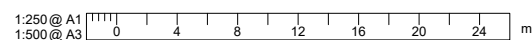
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Drawn	Designed	Approved	Revision Date
A. COOK	DARRELL O	G. EAST	06.07.12

Project No.	Scale
1-M9001.86	1:250 @ A1

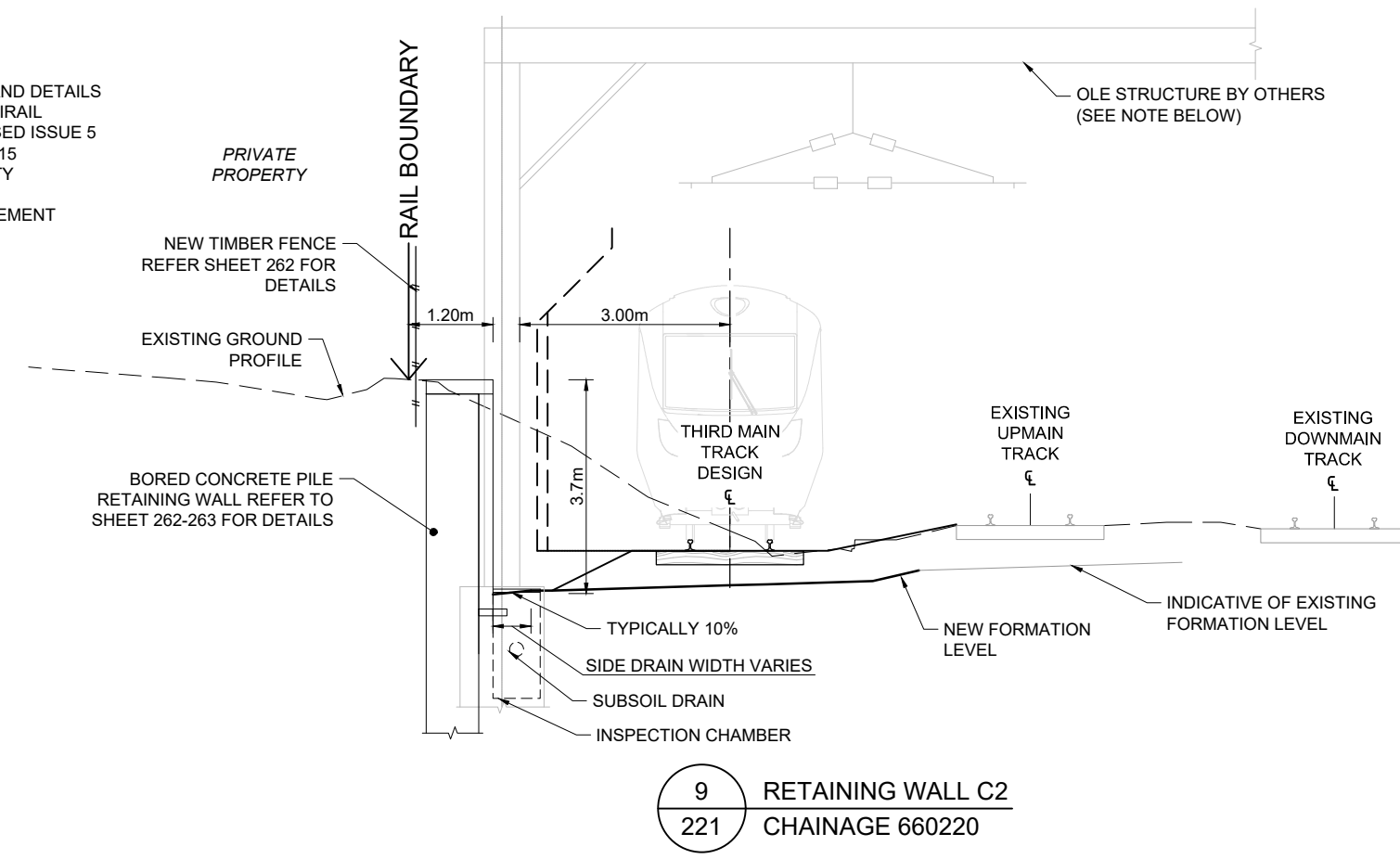
Project	Sheet	Sheet No.	Revision
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	RETAINING WALL C2 PLAN AND LONG SECTION LAYOUT 2 OF 2	222	RE

85% ISSUE

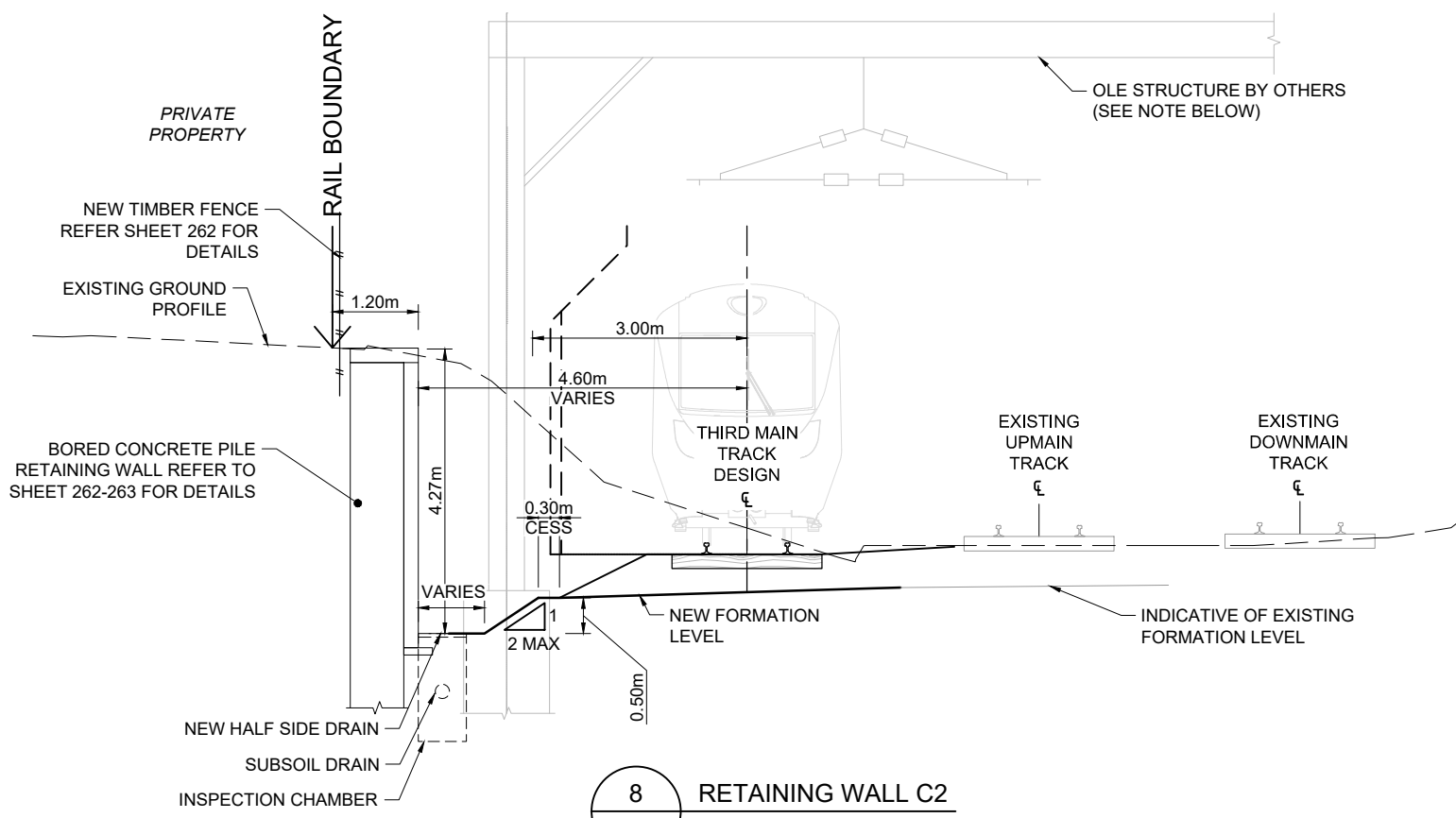


NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



9 RETAINING WALL C2
221 CHAINAGE 660220



8 RETAINING WALL C2
221 CHAINAGE 660140

NOTE:

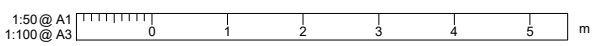
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR CONSENT	TW	03.07.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	20.07.16
RD	85% ISSUE UPDATED	PW	10.11.16

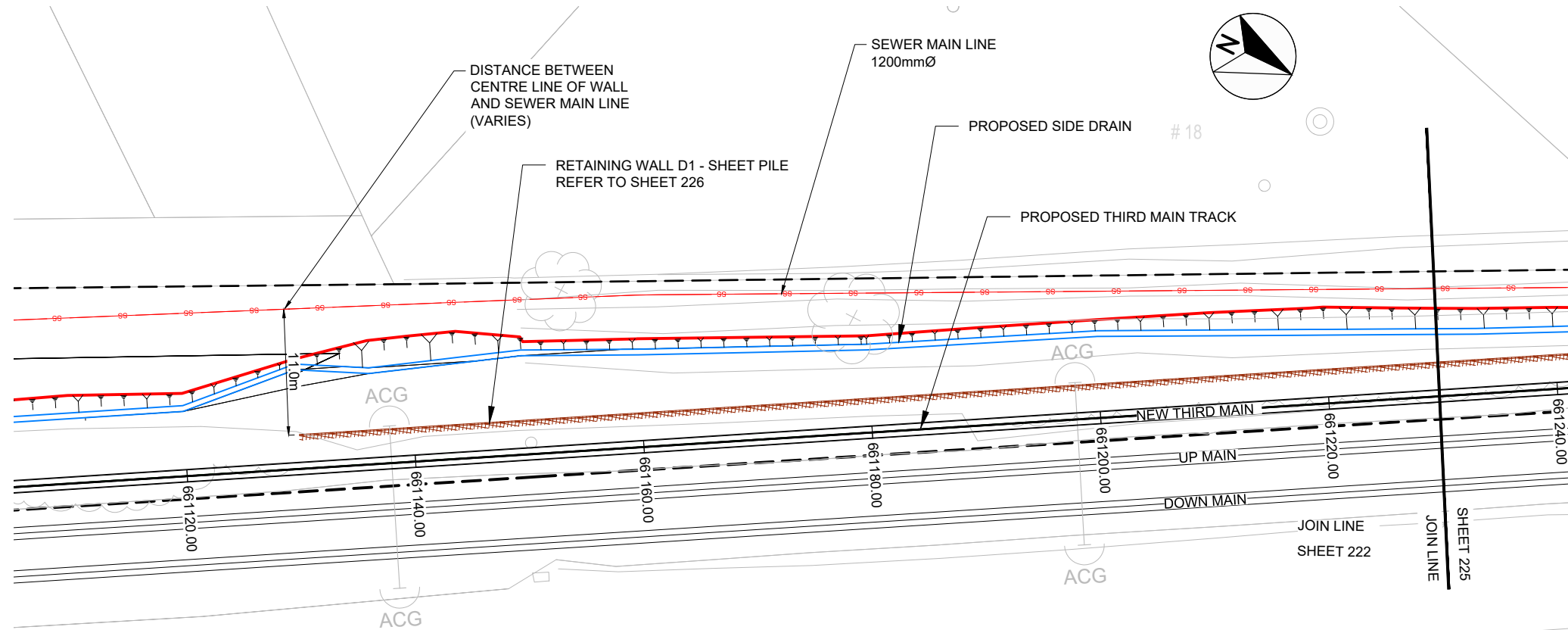


Drawn	Designed	Approved	Revision Date
A.COOK	VARIOUS	T.WILSON	03.07.12

Project		KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet		RETAINING WALL C2 SECTIONS	
Project No.	Scale	Drawing No.	Sheet No. / Revision
1-M9001.86	1:50 @ A1	1/6057/19/5104	223 / RD



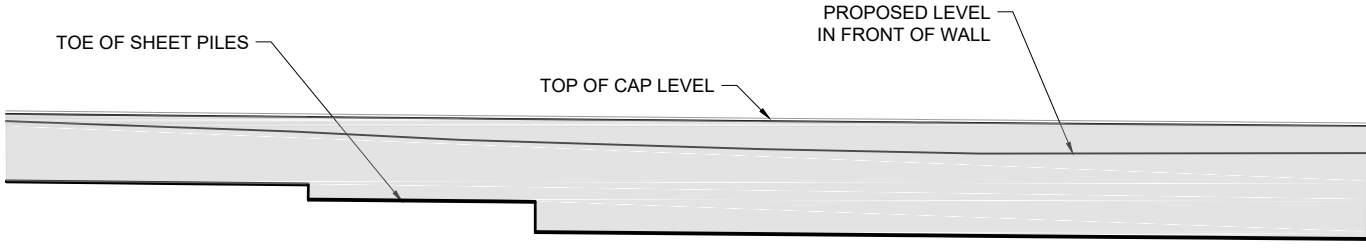
85% ISSUE



LEGEND:

- LEGAL BOUNDARIES
- - - RAIL BOUNDARIES
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG (TTC) OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- SHOT-CRETE FACING PANEL
- SHEET PILE WALL
- SS — SEWER MAIN

PLAN - RETAINING WALL D1
SCALE : 1:250



Datum R.L. 3.00

TOP OF CAP LEVEL	14.22	14.20	14.18	14.15	14.13	14.11	14.09	14.07	14.05	14.03	14.01	13.99	13.97	13.95	13.93	13.91	13.90	13.88	13.86	13.84	13.82	13.80	13.79	13.77	13.75	13.73	13.72	13.70	13.68	13.67	13.65	13.64	13.62	13.60	13.59	13.57	13.56	13.54	13.52	13.51	13.49	13.48	13.46	13.44	13.43	13.41	
FORMATION LEVEL	13.74	13.66	13.59	13.52	13.45	13.37	13.30	13.23	13.16	13.09	13.00	12.90	12.80	12.70	12.60	12.50	12.44	12.38	12.32	12.25	12.19	12.13	12.07	12.01	11.95	11.89	11.85	11.81	11.77	11.73	11.69	11.64	11.60	11.60	11.60	11.60	11.60	11.60	11.60	11.61	11.61	11.61	11.61	11.62	11.62	11.62	11.63
SHEET PILE INFORMATION	4.5m LONG AZ 12 - 770 SHEET PILES												5.5m LONG AZ 12 - 770 SHEET PILES					7.5m LONG AZ 12 - 770 SHEET PILES																													
WALL STATION	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00	42.00	44.00	46.00	48.00	50.00	52.00	54.00	56.00	58.00	60.00	62.00	64.00	66.00	68.00	70.00	72.00	74.00	76.00	78.00	80.00	82.00	84.00	86.00	88.00	90.00	92.00	94.00	96.00	98.00	100.00	
RAIL CHAINAGE	661130					661140					661150					661160			661165							661180									661200											661220	

LONG SECTION - RETAINING WALL D1
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	20.07.16
RF	85% ISSUE UPDATED	PW	08.11.16

KiwiRail

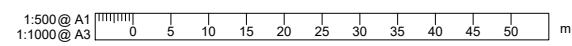
OPUS
Auckland South
+64 9 263 2500
Manukau 2241
New Zealand

Drawn: N.BOYTE
Designed: A.COOK
Approved: T.WILSON
Revision Date: 12.04.12

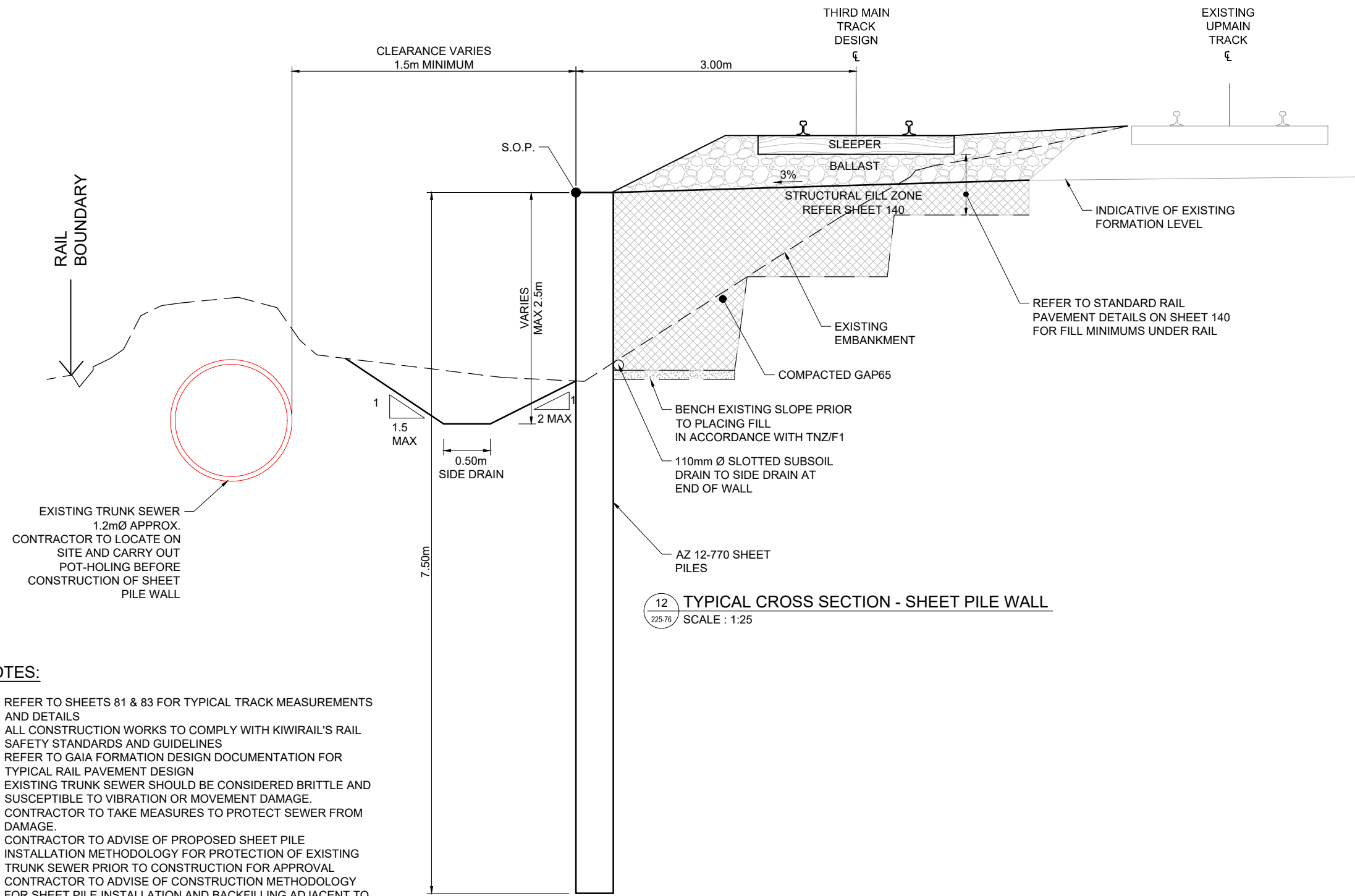
Project: 1-M9001.86
Scale: 1:500 @ A1

Project	KIWI RAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2
Sheet	RETAINING WALL D1 PLAN AND LONG SECTION LAYOUT 1 OF 2
Sheet No.	224
Revision	RE

85% ISSUE



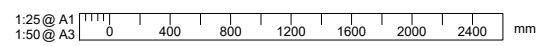
300 mm
200
100
0 10 mm



NOTES:

1. REFER TO SHEETS 81 & 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
3. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR TYPICAL RAIL PAVEMENT DESIGN
4. EXISTING TRUNK SEWER SHOULD BE CONSIDERED BRITTLE AND SUSCEPTIBLE TO VIBRATION OR MOVEMENT DAMAGE. CONTRACTOR TO TAKE MEASURES TO PROTECT SEWER FROM DAMAGE.
5. CONTRACTOR TO ADVISE OF PROPOSED SHEET PILE INSTALLATION METHODOLOGY FOR PROTECTION OF EXISTING TRUNK SEWER PRIOR TO CONSTRUCTION FOR APPROVAL
6. CONTRACTOR TO ADVISE OF CONSTRUCTION METHODOLOGY FOR SHEET PILE INSTALLATION AND BACKFILLING ADJACENT TO EXISTING UP-MAIN PRIOR TO CONSTRUCTION FOR APPROVAL.

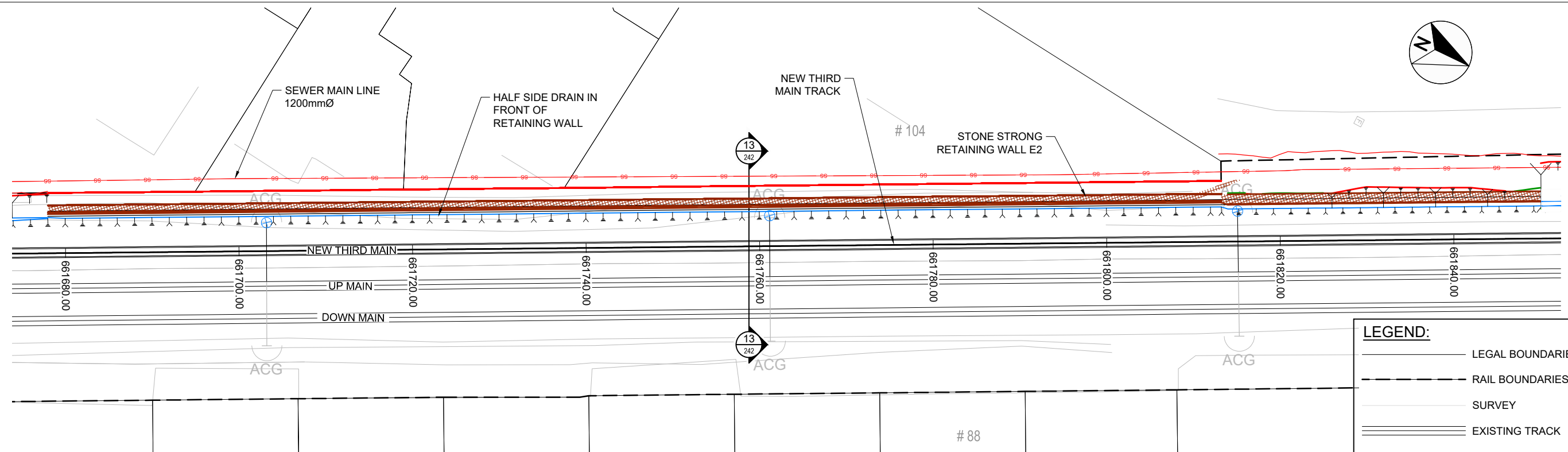
12 TYPICAL CROSS SECTION - SHEET PILE WALL
225-76 SCALE : 1:25



85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	DETAILED DESIGN ISSUE	TW	06.07.12
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	11.11.16

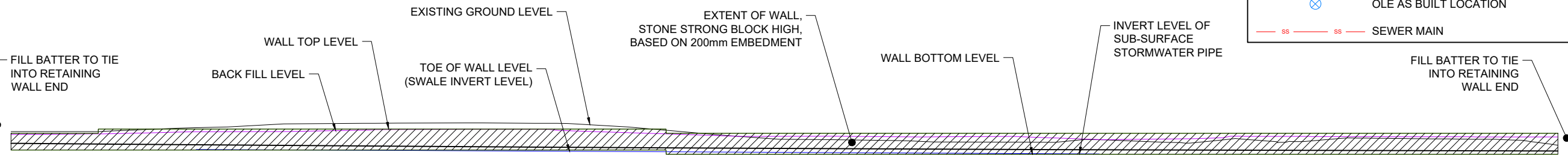
		Auckland Office PO Box 5848 Auckland 1141, New Zealand + 64 9 355 9500		Project KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2
		Drawn N.BOYTE	Designed DARRELL O	Approved T.WILSON	Revision Date 07.05.12
Project No. 1-M9001.86		Scale 1:25 @ A1		Drawing No. 1/6057/19/5104
Sheet No. 226				Revision RC



PLAN - RETAINING WALL E2
SCALE : 1:250

LEGEND:

- LEGAL BOUNDARIES
- - - RAIL BOUNDARIES
- SURVEY
- EXISTING TRACK
- NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG TTC T OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- STONE STRONG WALL
- ⊗ OLE AS BUILT LOCATION
- SS — SEWER MAIN



TOP OF WALL LEVEL	BACK FILL LEVEL	TOE OF WALL LEVEL	BOTTOM OF WALL LEVEL	WALL INFORMATION	WALL STATION	RAIL CHAINAGE
10.36	10.23	9.25	8.52	2 x 24SF Stone Strong Blocks (200mm Embedment)	2.00	661680
10.36	10.24	9.24	8.52		4.00	
10.36	10.26	9.22	8.52	2 x 24SF + 1 x 6SF STONE STRONG BLOCKS AT LEAST 200mm EMBEDMENT	6.00	
10.36	10.27	9.21	8.52		8.00	
10.36	10.28	9.19	8.52		10.00	
10.82	10.30	9.17	8.52		12.00	
10.82	10.34	9.16	8.52		14.00	
10.82	10.38	9.15	8.52		16.00	
10.82	10.42	9.13	8.52		18.00	
10.82	10.48	9.12	8.52		20.00	
10.82	10.53	9.10	8.52		22.00	
10.82	10.53	9.09	8.52		24.00	
10.82	10.54	9.07	8.52		26.00	
10.82	10.54	9.06	8.52		28.00	
10.82	10.54	9.04	8.52		30.00	
10.82	10.55	9.03	8.52		32.00	
10.82	10.58	9.01	8.52		34.00	
10.82	10.62	9.00	8.52		36.00	
10.82	10.65	8.98	8.52		38.00	
10.82	10.69	8.97	8.52		40.00	
10.82	10.75	8.96	8.52		42.00	
10.82	10.76	8.94	8.52		44.00	
10.82	10.77	8.93	8.52		46.00	
10.82	10.78	8.92	8.52		48.00	
10.82	10.79	8.90	8.52		50.00	
10.82	10.80	8.89	8.52		52.00	
10.82	10.80	8.88	8.52		54.00	
10.82	10.80	8.87	8.52		56.00	
10.82	10.80	8.85	8.52		58.00	
10.82	10.49	8.80	8.52		60.00	
10.82	10.43	8.78	8.52		70.00	
10.82	10.37	8.77	8.52		72.00	
10.82	10.30	8.76	8.52		74.00	
10.36	10.23	8.75	8.06		76.00	
10.36	10.16	8.74	8.06		78.00	
10.36	10.09	8.73	8.06		80.00	
10.36	10.02	8.72	8.06		82.00	
10.36	10.02	8.71	8.06		84.00	
10.36	10.02	8.70	8.06		86.00	
10.36	10.03	8.70	8.06		88.00	
10.36	10.03	8.69	8.06		90.00	
10.36	10.03	8.68	8.06		92.00	
10.36	10.02	8.67	8.06		94.00	
10.36	10.00	8.66	8.06		96.00	
10.36	9.98	8.65	8.06		98.00	
10.36	9.97	8.64	8.06		100.00	
10.36	9.95	8.63	8.06		102.00	
10.36	9.96	8.62	8.06		104.00	
10.36	9.98	8.61	8.06		106.00	
10.36	9.99	8.60	8.06		108.00	
10.36	10.00	8.59	8.06		110.00	
10.36	10.02	8.59	8.06		112.00	
10.36	9.95	8.58	8.06		114.00	
10.36	9.87	8.57	8.06		116.00	
10.36	9.80	8.56	8.06		118.00	
10.36	9.73	8.55	8.06		120.00	
10.36	9.66	8.55	8.06		122.00	
10.36	9.68	8.54	8.06		124.00	
10.36	9.70	8.53	8.06		126.00	
10.36	9.72	8.53	8.06		128.00	
10.36	9.74	8.52	8.06		130.00	
10.36	9.77	8.51	8.06		132.00	
10.36	9.84	8.51	8.06		134.00	
10.36	10.03	8.50	8.06		136.00	
10.36	10.03	8.49	8.06		138.00	
10.36	10.02	8.49	8.06		140.00	
10.36	10.01	8.48	8.06		142.00	
10.36	10.01	8.48	8.06		144.00	
10.36	10.00	8.47	8.06		146.00	
10.36	10.00	8.47	8.06		148.00	
10.36	9.99	8.47	8.06		150.00	
10.36	9.99	8.46	8.06		152.00	
10.36	9.98	8.46	8.06		154.00	
10.36	9.98	8.45	8.06		156.00	
10.36	9.98	8.45	8.06		158.00	
10.36	9.97	8.44	8.06		160.00	
10.36	9.97	8.44	8.06		162.00	
10.36	9.96	8.44	8.06		164.00	
10.36	9.96	8.43	8.06		166.00	
10.36	9.95	8.43	8.06		168.00	
10.36	9.95	8.42	8.06		170.00	
10.36	9.95	8.42	8.06		172.00	

Wall E2
SECTION BETWEEN CH: 2.00 AND 172.00
1 x VERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL E2
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Project
KIWI RAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

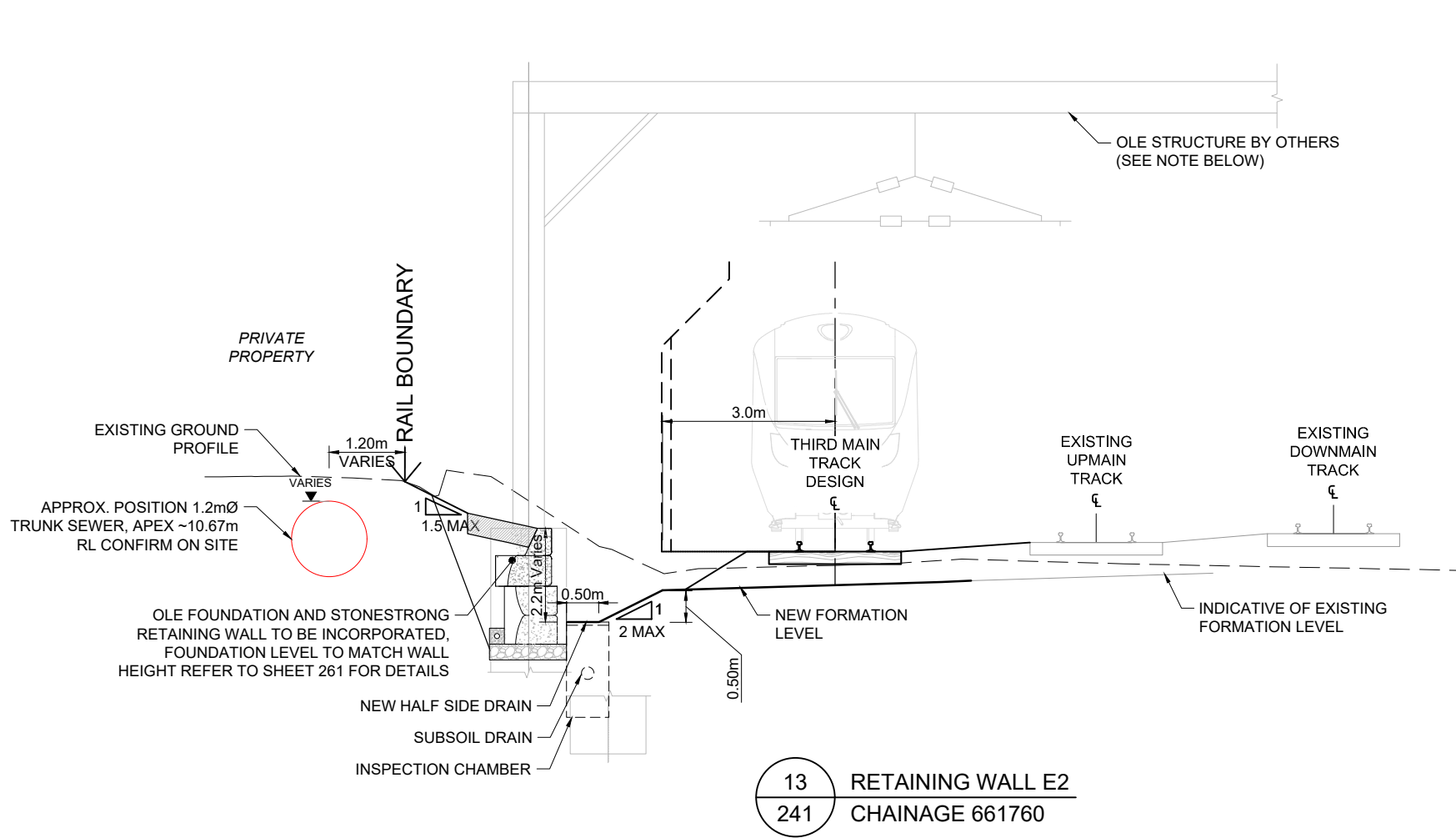
Sheet
RETAINING WALL E2
PLAN AND LONG SECTION

Drawn: A. COOK, Designed: S. HUSZAK, Approved: PAUL WILLEY, Revision Date: 20.07.16

Project No.: 1-M9001.86, Scale: 1:500 @ A1, Drawing No.: 1/6057/19/5104, Sheet No.: 241, Revision: RC

NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



NOTE:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	AMENDED TITLE FOR OPW ISSUE	TW	30.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	20.07.16
RF	85% ISSUE UPDATED	PW	10.11.16

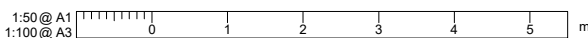


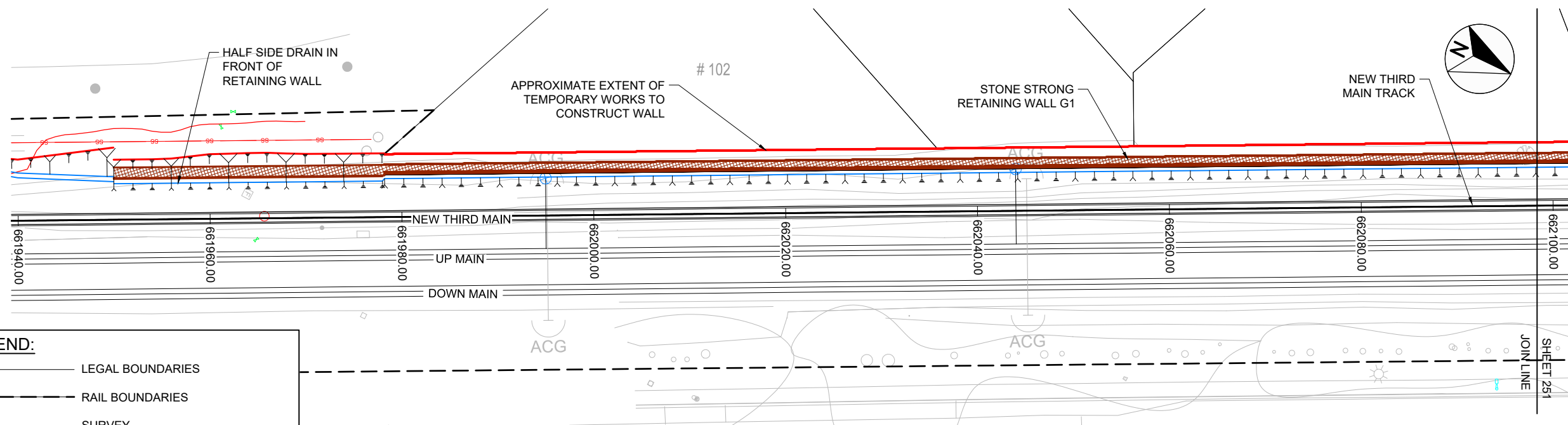
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Drawn	Designed	Approved	Revision Date
N.BOYTE	VARIOUS	T.WILSON	07.05.12

Project No.	Scale
1-M9001.86	1:50 @ A1

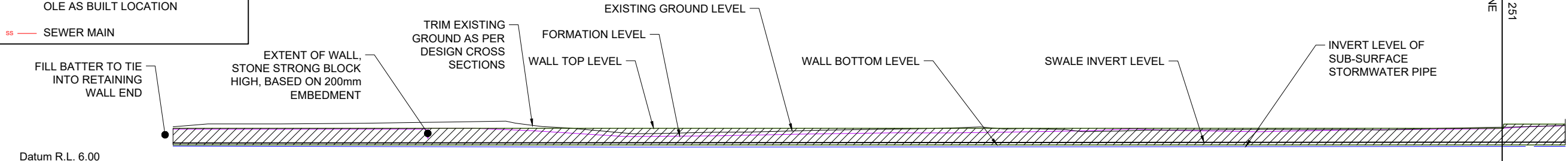
Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
RETAINING WALL E2 SECTION	
Sheet No.	Revision
242	RF





LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- SURVEY
- EXISTING TRACK
- NEW THIRD MAIN
- EARTHWORKS - CUT
- OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- STONE STRONG WALL
- OLE AS BUILT LOCATION
- SEWER MAIN



TOP OF WALL LEVEL	BACK FILL LEVEL	TOE OF WALL LEVEL	BOTTOM OF WALL LEVEL	WALL INFORMATION	WALL STATION	RAIL CHAINAGE
10.05	8.89	8.41	8.21	2 x 24SF STONE STRONG BLOCKS, AT LEAST 200mm EMBEDMENT	0.0	661950
10.05	9.95	8.42	8.21		2.0	661950
10.05	9.95	8.42	8.21		4.0	661950
10.05	9.95	8.42	8.21		6.0	661950
10.05	9.95	8.42	8.21		8.0	661950
10.05	9.95	8.42	8.21		10.0	661960
10.05	9.96	8.42	8.21		12.0	661960
10.05	9.96	8.42	8.21		14.0	661960
10.05	9.96	8.42	8.21		16.0	661960
10.05	9.96	8.43	8.21		18.0	661960
10.05	9.96	8.43	8.21		20.0	661960
10.05	9.96	8.43	8.21		22.0	661960
10.05	9.96	8.43	8.21		24.0	661960
10.05	9.97	8.43	8.21		26.0	661960
10.05	9.97	8.43	8.21		28.0	661980
10.05	10.05	8.43	8.21		30.0	661980
10.05	10.02	8.44	8.21		32.0	661980
10.05	10.02	8.44	8.21		34.0	661980
10.05	9.94	8.44	8.21		36.0	661980
10.05	9.85	8.44	8.21		38.0	661980
10.05	9.77	8.44	8.21		40.0	661980
10.05	9.64	8.44	8.21		42.0	661980
10.05	9.52	8.44	8.21		44.0	661980
10.05	9.39	8.44	8.21		46.0	661980
10.05	9.26	8.45	8.21		48.0	662000
10.05	9.14	8.45	8.21		50.0	662000
10.05	9.15	8.45	8.21		52.0	662000
10.05	9.17	8.45	8.21		54.0	662000
10.05	9.18	8.45	8.21	56.0	662000	
10.05	9.19	8.45	8.21	58.0	662000	
10.05	9.21	8.45	8.21	60.0	662000	
10.05	9.25	8.46	8.21	62.0	662020	
10.05	9.29	8.46	8.21	64.0	662020	
10.05	9.33	8.46	8.21	66.0	662020	
10.05	9.37	8.46	8.21	68.0	662020	
10.05	9.42	8.46	8.21	70.0	662020	
10.05	9.44	8.46	8.21	72.0	662040	
10.05	9.47	8.46	8.21	74.0	662040	
10.05	9.49	8.46	8.21	76.0	662040	
10.05	9.52	8.47	8.21	78.0	662040	
10.05	9.55	8.47	8.21	80.0	662040	
10.05	9.54	8.47	8.21	82.0	662040	
10.05	9.54	8.47	8.21	84.0	662040	
10.05	9.54	8.47	8.21	86.0	662040	
10.05	9.56	8.47	8.21	88.0	662040	
10.05	9.59	8.47	8.21	90.0	662060	
10.05	9.62	8.48	8.21	92.0	662060	
10.05	9.66	8.48	8.21	94.0	662060	
10.05	9.69	8.48	8.21	96.0	662060	
10.05	9.72	8.48	8.21	98.0	662060	
10.05	9.75	8.48	8.21	100.0	662080	
10.05	9.82	8.48	8.21	102.0	662080	
10.05	9.90	8.48	8.21	104.0	662080	
10.05	9.97	8.48	8.21	106.0	662080	
10.05	9.91	8.49	8.21	108.0	662080	
10.05	9.83	8.49	8.21	110.0	662080	
10.05	9.80	8.49	8.21	112.0	662080	
10.05	9.77	8.49	8.21	114.0	662080	
10.05	9.73	8.49	8.21	116.0	662080	
10.05	9.70	8.49	8.21	118.0	662080	
10.05	9.67	8.49	8.21	120.0	662080	
10.05	9.71	8.50	8.21	122.0	662080	
10.05	9.75	8.50	8.21	124.0	662080	
10.05	9.79	8.50	8.21	126.0	662080	
10.05	9.83	8.50	8.21	128.0	662080	
10.05	9.87	8.50	8.21	130.0	662080	
10.05	9.88	8.50	8.21	132.0	662080	
10.05	9.90	8.50	8.21	134.0	662080	
10.05	9.91	8.50	8.21	136.0	662080	
10.05	9.93	8.51	8.21	138.0	662080	
10.05	9.94	8.51	8.21	140.0	662080	
10.05	9.96	8.51	8.21	142.0	662080	
10.05	9.98	8.51	8.21	144.0	662080	
10.05	10.00	8.51	8.21	146.0	662100	
10.05	10.00	8.51	8.21	148.0	662100	
10.51	10.11	8.51	8.21	150.0	662100	
10.51	10.22	8.51	8.21	152.0	662100	
10.51	10.34	8.51	8.21	154.0	662100	

Wall G 1 Stone Strong Wall
SECTION BETWEEN CH: 0.00 AND 154.00
1xVERTICAL EXAGGERATION

LONG SECTION - RETAINING WALL G1 STONE STRONG WALL
SCALE : 1:250

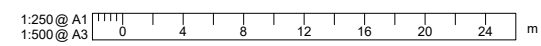
NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	08.11.16



OPUS
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

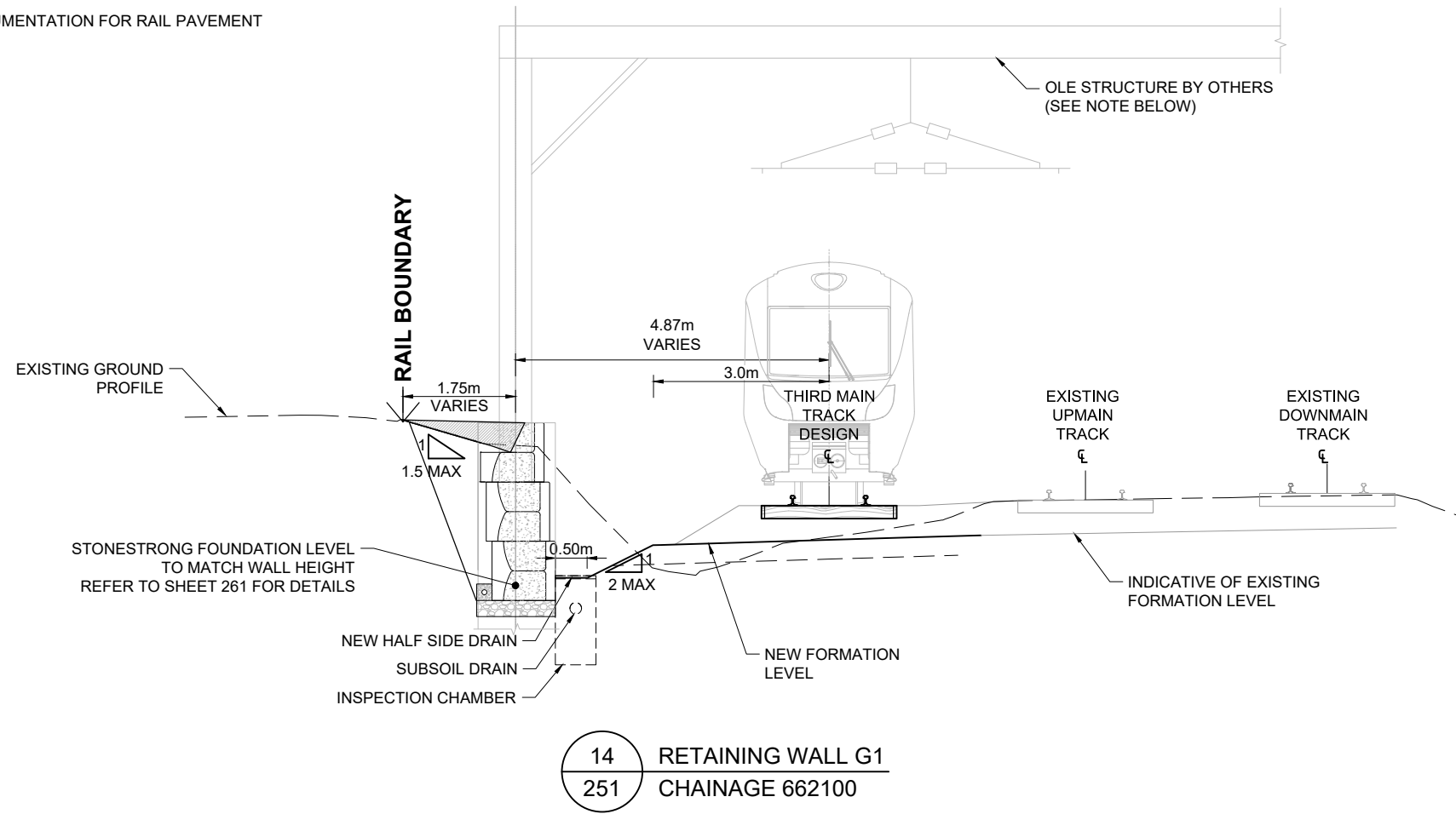
Project	Sheet	Drawn	Designed	Approved	Revision Date
KIWI RAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	RETAINING WALL G1 PLAN AND LONG SECTION - LAYOUT 1 OF 3	A LAKSMAN	S HUSZAK	PAUL WILLEY	20.07.16
Sheet No.	Revision				
250	RC				



85% ISSUE

NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



14 RETAINING WALL G1
251 CHAINAGE 662100

NOTE:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

85% ISSUE

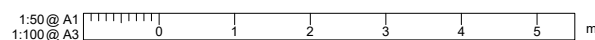
Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	MIDDLEMORE PRELIMINARY DESIGN	TW	20.06.12
RC	DETAILED DESIGN ISSUE	TW	06.07.12
RD	85% ISSUE	PW	20.07.16
RE	85% ISSUE UPDATED	PW	10.11.16



Drawn	Designed	Approved	Revision Date
A. COOK	VARIOUS	T. WILSON	07.05.12

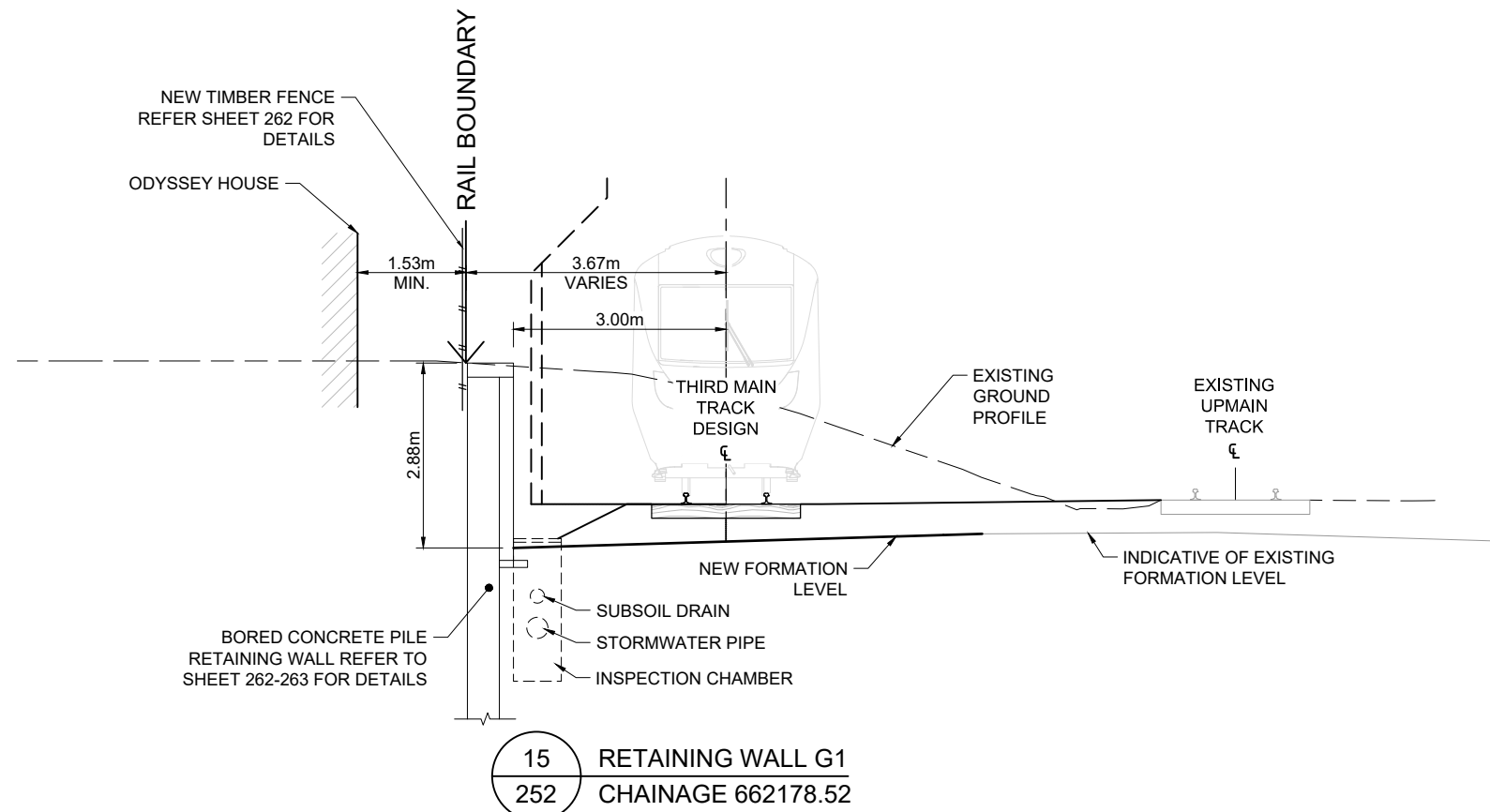
Project No.	Scale
1-M9001.86	1:50 @ A1

Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
RETAINING WALL G1 SECTIONS 1 OF 2	
Sheet No.	Revision
253	RE



NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN



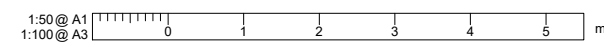
NOTE:

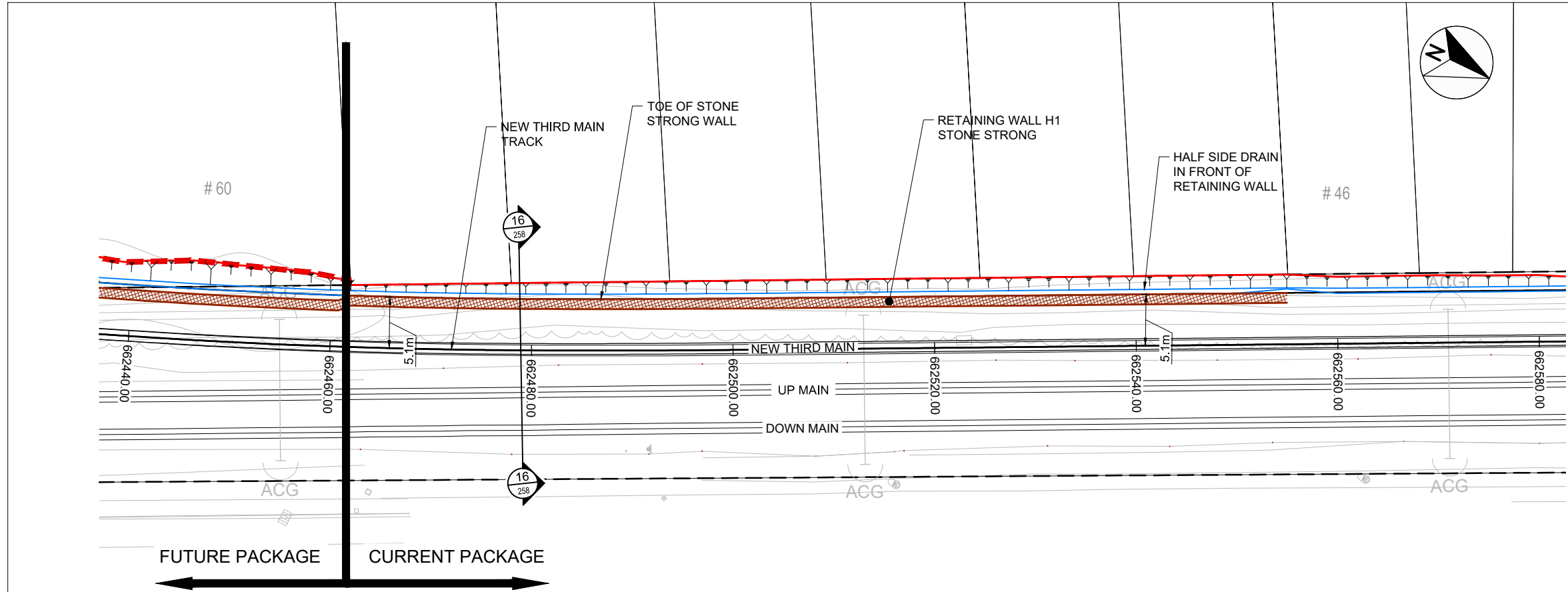
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	10.11.16

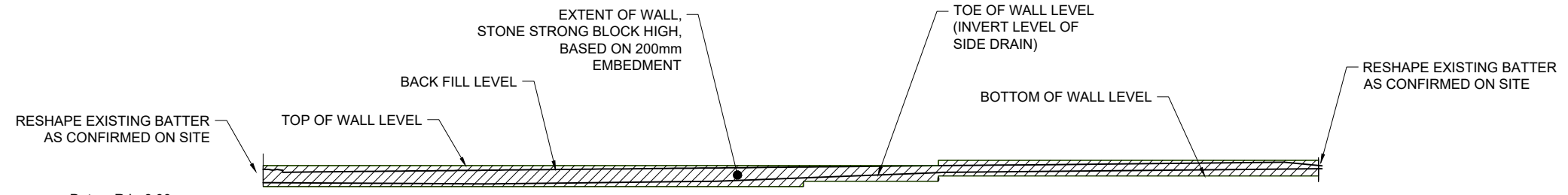
						Auckland Office PO Box 5848 Auckland 1141, New Zealand + 64 9 355 9500		Project KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
						Drawn A. COOK		Designed VARIOUS		Approved T. WILSON		Revision Date 07.05.12
Project No. 1-M9001.86				Scale 1:50 @ A1		Drawing No. 1/6057/19/5104		Sheet No. 254	
Revision RC								Revision RC	





LEGEND:

- LEGAL BOUNDARIES
- RAIL BOUNDARIES
- SURVEY
- ==== EXISTING TRACK
- ==== NEW THIRD MAIN
- EARTHWORKS - CUT
- ACG (TTC) OVERHEAD LINE EQUIPMENT (OLE)
- SIDE DRAIN
- STONE STRONG WALL
- ⊗ OLE AS BUILT LOCATION



Datum R.L. 6.00	
TOP OF WALL LEVEL	9.91
BACK FILL LEVEL	9.55
TOE OF WALL LEVEL	8.39
BOTTOM OF WALL LEVEL	8.07
WALL INFORMATION	2 x 24SF STONE STRONG BLOCKS, AT LEAST 200mm EMBEDMENT
WALL STATION	60.00
RAIL CHAINAGE	662460

Wall H-1
SECTION BETWEEN CH: 60.00 AND 153.00

LONG SECTION - RETAINING WALL H1
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

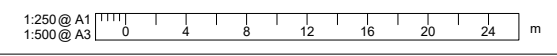
Revision	Amendment	Approved	Revision Date
RA	DETAILED DESIGN ISSUE	GE	06.07.12
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	08.11.16



Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

Project			
KIWIRAIL MIDDLEMORE TO PUHINUI NEW THIRD MAIN - STAGE 2			
Sheet			
RETAINING WALL H1 PLAN AND LONG SECTION			
Project No.		Scale	Drawing No.
1-C0681.00		1:250 @ A1	1/6057/19/5104
Drawn	Designed	Approved	Revision Date
A COOK	DARRELL O	G.EAST	06.07.12
Sheet No.	Revision		
256	RC		

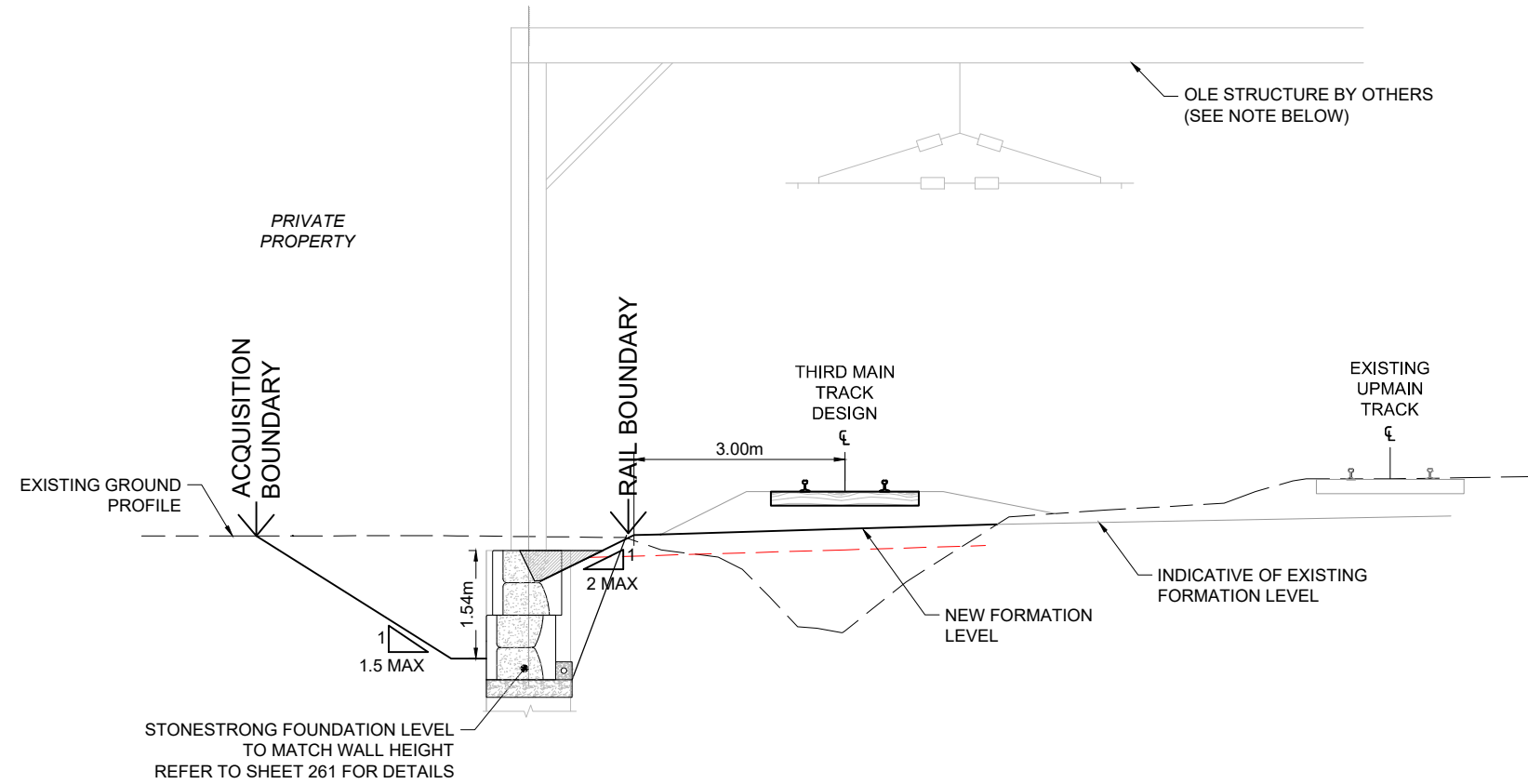
85% ISSUE



NOTES:

1. REFER TO SHEETS 81 AND 83 FOR TYPICAL TRACK MEASUREMENTS AND DETAILS
2. FOR STANDARD TRACK MEASUREMENTS AND DETAILS REFER TO KIWIRAIL 'INFRASTRUCTURE AND ENGINEERING T200 TRACK HANDBOOK' REVISED ISSUE 5 DATED JAN 2015 & KIWIRAIL DRAWINGS 100 862 - 1 TO 6 DATED JAN 2015
3. ALL CONSTRUCTION WORKS TO COMPLY WITH KIWIRAIL'S RAIL SAFETY STANDARDS AND GUIDELINES
4. REFER TO GAIA FORMATION DESIGN DOCUMENTATION FOR RAIL PAVEMENT DESIGN

300 mm
200
100
50
0 10 mm



16 RETAINING WALL H1
256 CHAINAGE 662480

NOTE ON OLE OBJECTS:

EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE WITH RETAINING WALL DESIGNS

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR CONSENT	TW	03.07.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	20.07.16
RD	85% ISSUE UPDATED	PW	10.11.16



Drawn	Designed	Approved	Revision Date
A.COOK	VARIOUS	T.WILSON	03.07.12

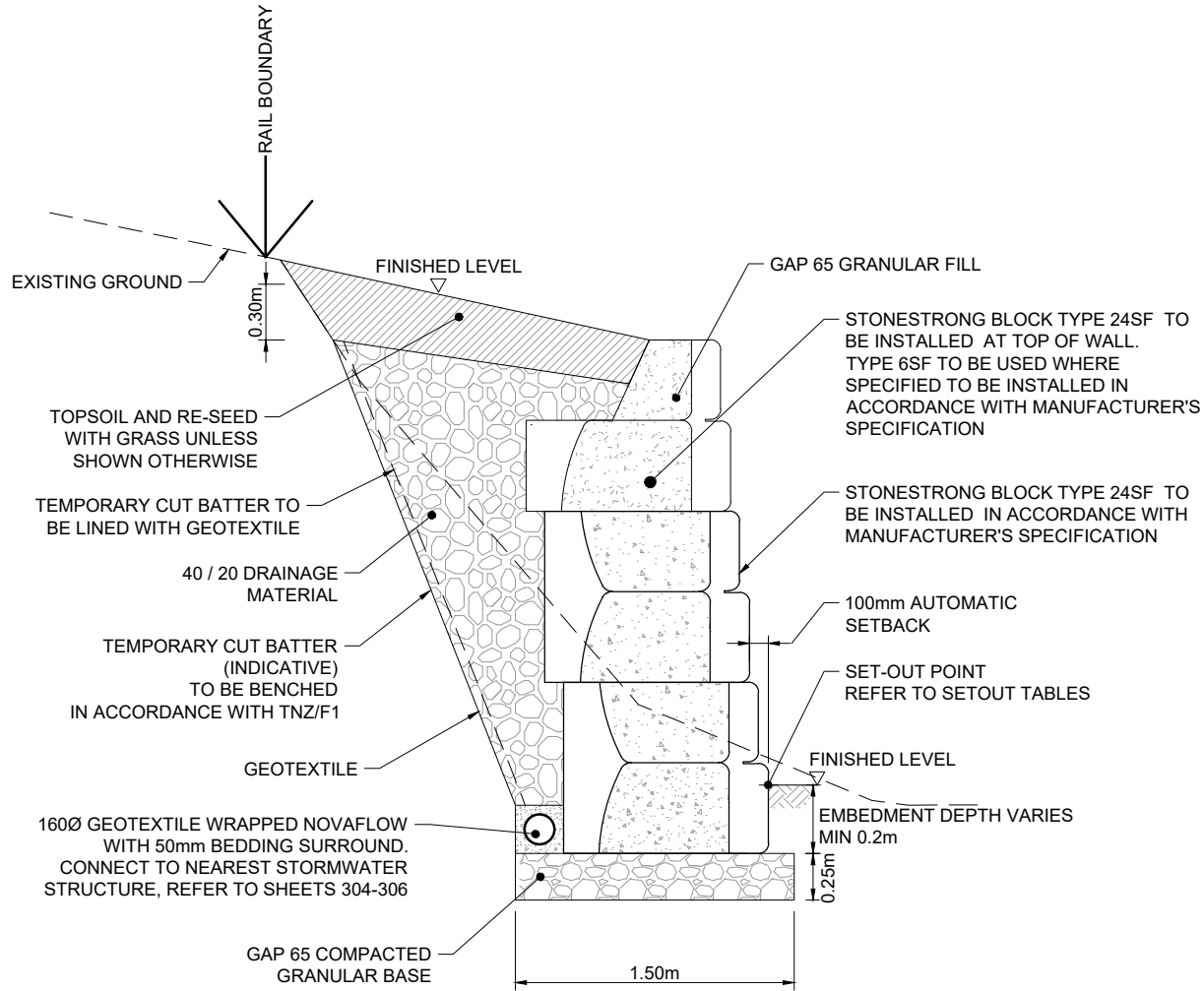
Project No.	Scale
1-M9001.86	1:50 @ A1

Project	Sheet	Sheet No.	Revision
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	RETAINING WALL H1 SECTION	258	RD

Scale	0	1	2	3	4	5	m
1:50 @ A1 1:100 @ A3							

NOTES:

1. RETAINED HEIGHTS AND STONE STRONG BLOCK CONFIGURATIONS DIFFER BETWEEN RETAINING WALLS REFER TO CORRESPONDING PLAN AND LONG SECTION DRAWINGS AND SECTION DRAWINGS
2. STONE STRONG BLOCK CONFIGURATIONS UTILISE BOTH TYPE 24SF AND TYPE 6SF BLOCKS
3. SLOPE OF BACKFILL BEHIND TOP OF WALL TO BE MAXIMUM OF 2H : 1V WHERE AFFECTED BY RAILWAY LOADING AND MAXIMUM OF 1.5H : 1V WHERE OUTSIDE OF ZONE OF INFLUENCE OF RAILWAY LOADING



DETAILS - STONE STRONG RETAINING WALL
SCALE: 1:20

300 mm
200
100
50
0 10 mm

1:20 @ A1
1:40 @ A3

Original Sheet Size A1 [841x594] Plot Date 03/07/12 @ 10:39 k:\kiwirail\1_6057_19\5104\1_6057_19_5104_261.dwg - 261

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	MIDDLEMORE PRELIMINARY DESIGN	TW	20.06.12
RC	DETAILED DESIGN ISSUE	GE	06.07.12
RD	85% ISSUE	PW	20.07.16
RE	85% ISSUE UPDATED	PW	08.11.16

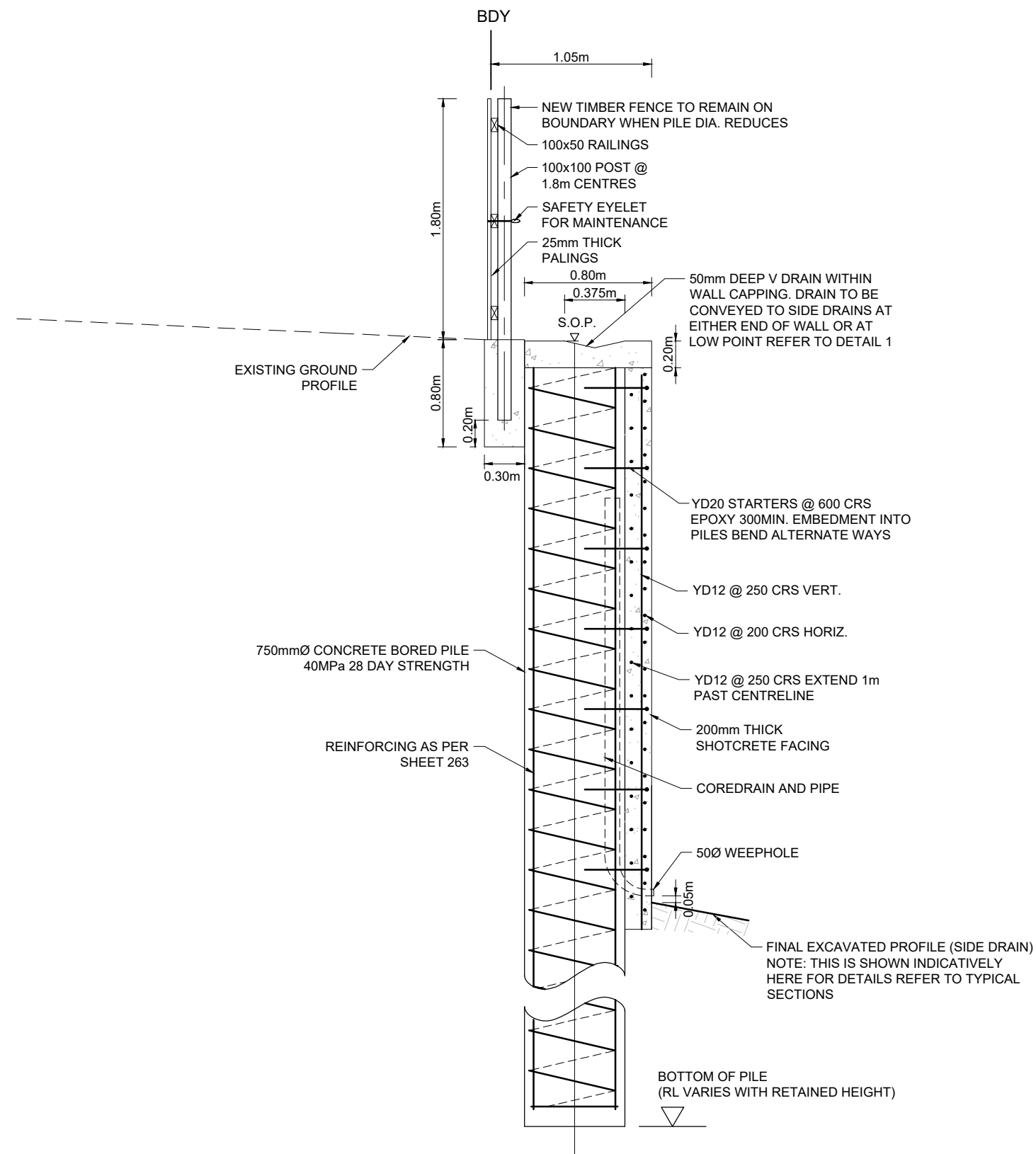


Drawn	Designed	Approved	Revision Date
N.BOYTE	DARRELL O	G.EAST	06.07.12

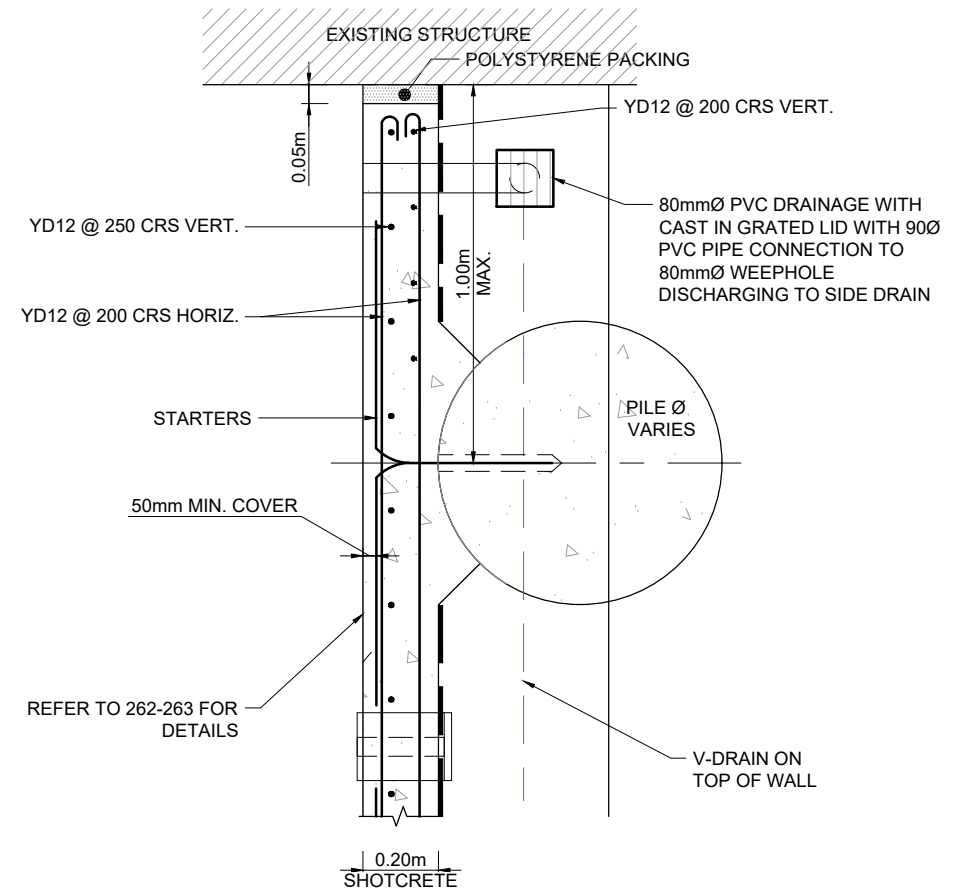
Project No.	Scale
1-M9001.86	1:20 @ A1

Project	
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet	
RETAINING WALL DETAILS STONE STRONG	
Sheet No.	Revision
261	RE

300 mm
200
100
50
10 mm
0



SECTION - 600Ø BORED PILE RETAINING WALL
SCALE: 1:20
450Ø SIMILAR



DETAIL 1 - WALL END CANTILEVER AND LOW POINT DRAINAGE DETAIL
SCALE: 1:10

1:20 @ A1
1:40 @ A3
0 200 400 600 800 1000 1200 1400 1600 1800 2000 mm

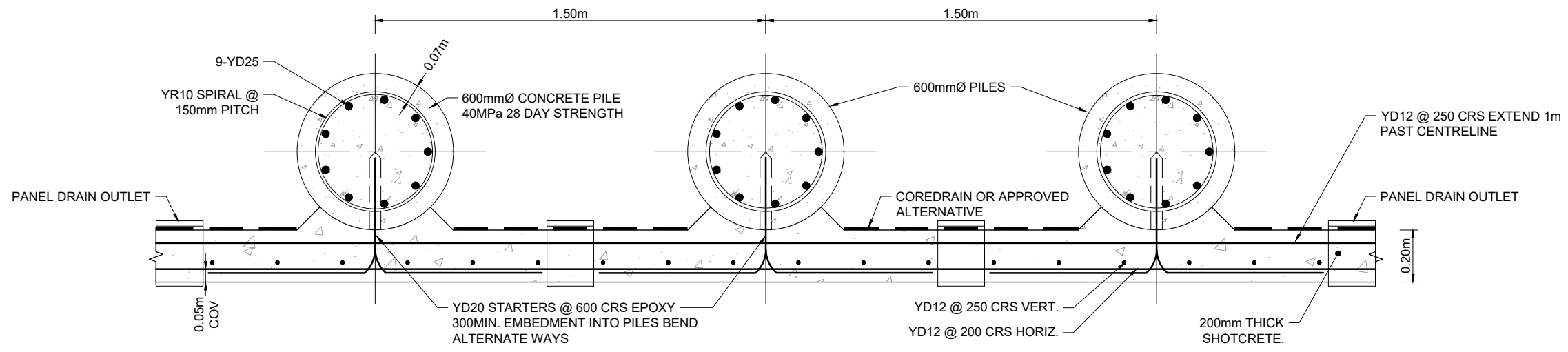
Revision	Amendment	Approved	Revision Date
RA	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RB	DETAILED DESIGN ISSUE	TW	06.07.12
RC	85% ISSUE	PW	20.07.16
RD	85% ISSUE UPDATED	PW	08.11.16



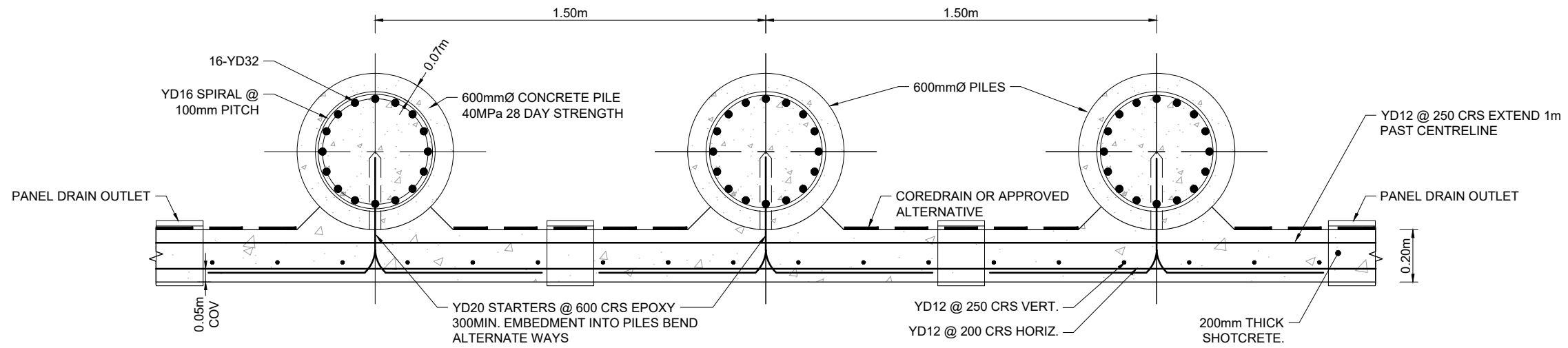
Drawn	Designed	Approved	Revision Date
N.BOYTE	DARRELL O	T.WILSON	07.05.12

Project		
KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2		
Sheet		
RETAINING WALL DETAILS BORED PILE LAYOUT 1 OF 2		
Project No.	Scale	
1-M9001.86	1:20 @ A1	
Drawn No.	Sheet No.	Revision
1/6057/19/5104	262	RD

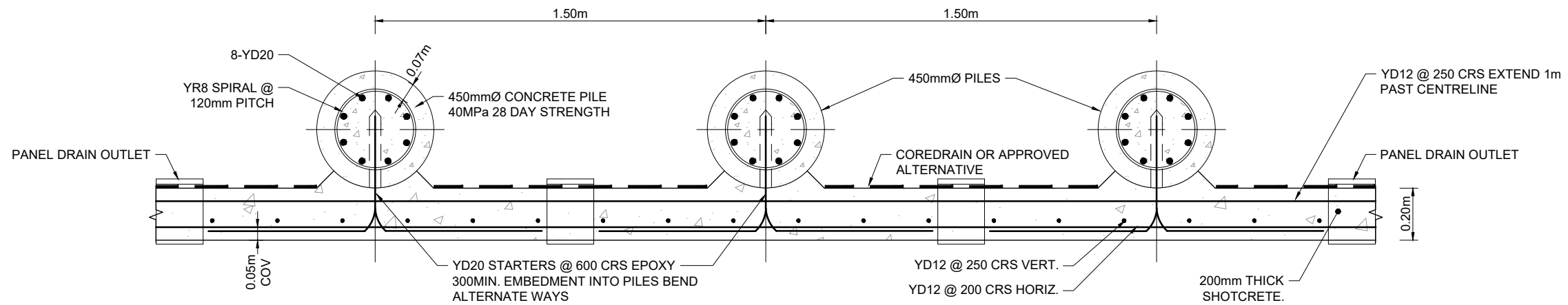
85% ISSUE



SHOTCRETE TREATMENT TO 600Ø TYPE1 BORED PILE RETAINING WALL
SCALE: 1:10



SHOTCRETE TREATMENT TO 600Ø TYPE2 BORED PILE RETAINING WALL
SCALE: 1:10



SHOTCRETE TREATMENT TO 450Ø BORED PILE RETAINING WALL
SCALE: 1:10

85% ISSUE

Revision	Amendment	Approved	Revision Date
RA	DETAILED DESIGN ISSUE	TW	06.07.12
RB	85% ISSUE	PW	20.07.16
RC	85% ISSUE UPDATED	PW	08.11.16



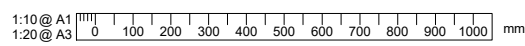
Auckland Office
PO Box 5848
Auckland 1141, New Zealand
+ 64 9 355 9500

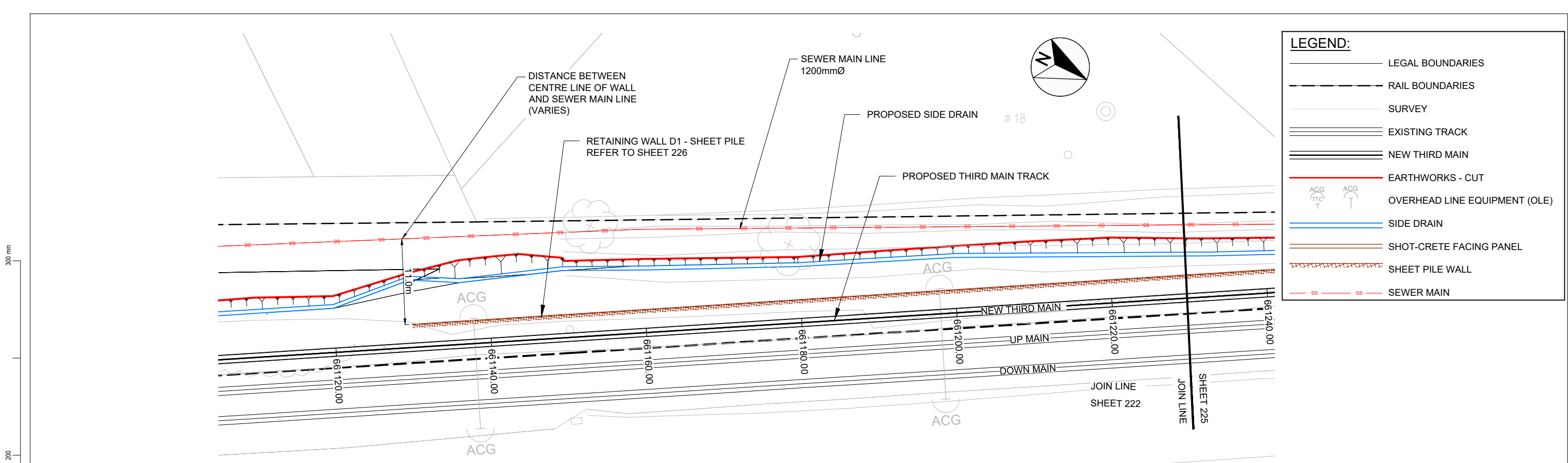
Drawn	Designed	Approved	Revision Date
N.BOYTE	A.HARRISON	T.WILSON	.06.12
Project No.	Scale	Drawing No.	Sheet No.
1-M9001.86	1:10 @ A1	1/6057/19/5104	263

Project
KIWIRAIL
MIDDLEMORE (662,600m) TO PUHINUI (659,000m)
NEW THIRD MAIN - STAGE 2

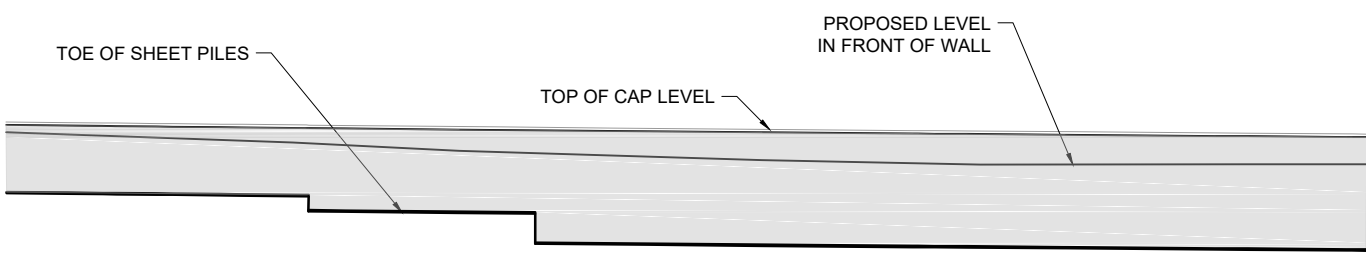
Sheet
RETAINING WALL DETAILS
BORED PILE LAYOUT 2 OF 2

Revision
RC





PLAN - RETAINING WALL D1
SCALE : 1:250



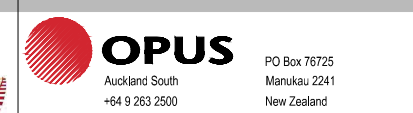
Datum R.L. 3.00

TOP OF CAP LEVEL	13.74	14.22	13.66	14.20	13.59	14.18	13.52	14.15	13.45	14.13	13.37	14.11	13.30	14.09	13.23	14.07	13.16	14.05	13.09	14.03	13.00	14.01	12.90	13.99	12.80	13.97	12.70	13.95	12.60	13.93	12.50	13.91	12.44	13.90	12.38	13.88	12.32	13.86	12.25	13.84	12.19	13.82	12.13	13.80	12.07	13.79	12.01	13.77	11.95	13.75	11.89	13.73	11.85	13.72	11.81	13.70	11.77	13.68	11.73	13.67	11.69	13.65	11.64	13.64	11.61	13.62	11.60	13.60	11.60	13.59	11.60	13.57	11.60	13.56	11.60	13.54	11.61	13.52	11.61	13.51	11.61	13.51	11.61	13.49	11.61	13.48	11.62	13.46	11.62	13.44	11.62	13.43	11.63	13.41
FORMATION LEVEL	13.74	14.22	13.66	14.20	13.59	14.18	13.52	14.15	13.45	14.13	13.37	14.11	13.30	14.09	13.23	14.07	13.16	14.05	13.09	14.03	13.00	14.01	12.90	13.99	12.80	13.97	12.70	13.95	12.60	13.93	12.50	13.91	12.44	13.90	12.38	13.88	12.32	13.86	12.25	13.84	12.19	13.82	12.13	13.80	12.07	13.79	12.01	13.77	11.95	13.75	11.89	13.73	11.85	13.72	11.81	13.70	11.77	13.68	11.73	13.67	11.69	13.65	11.64	13.64	11.61	13.62	11.60	13.60	11.60	13.59	11.60	13.57	11.60	13.56	11.60	13.54	11.61	13.52	11.61	13.51	11.61	13.51	11.61	13.49	11.61	13.48	11.62	13.46	11.62	13.44	11.62	13.43	11.63	13.41
SHEET PILE INFORMATION	4.5m LONG AZ 12 - 770 SHEET PILES										5.5m LONG AZ 12 - 770 SHEET PILES										7.5m LONG AZ 12 - 770 SHEET PILES																																																																									
WALL STATION	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00	42.00	44.00	46.00	48.00	50.00	52.00	54.00	56.00	58.00	60.00	62.00	64.00	66.00	68.00	70.00	72.00	74.00	76.00	78.00	80.00	82.00	84.00	86.00	88.00	90.00	92.00	94.00	96.00	98.00	100.00																																																
RAIL CHAINAGE	661130	661140	661150	661160	661165	661180	661200	661220	661240	661250	661260	661270	661280	661290	661300	661310	661320	661330	661340	661350	661360	661370	661380	661390	661400	661410	661420	661430	661440	661450	661460	661470	661480	661490	661500	661510	661520	661530	661540	661550	661560	661570	661580	661590	661600	661610	661620	661630	661640	661650	661660	661670	661680	661690	661700	661710	661720	661730	661740	661750	661760	661770	661780	661790	661800	661810	661820	661830	661840	661850	661860	661870	661880	661890	661900	661910	661920	661930	661940	661950	661960	661970	661980	661990	662000									

LONG SECTION - RETAINING WALL D1
SCALE : 1:250

NOTE:
EXACT LOCATION OF EXISTING OLE STRUCTURES IS TO BE CONFIRMED BY SURVEY TO ENSURE NO CLASH WITH RETAINING WALL DESIGNS

Revision	Amendment	Approved	Revision Date
RA	ISSUED FOR OUTLINE PLAN OF WORKS	AC	12.04.12
RB	PRELIMINARY DESIGN ISSUE	TW	07.05.12
RC	ISSUED FOR CONSENT	TW	03.07.12
RD	DETAILED DESIGN ISSUE	TW	06.07.12
RE	85% ISSUE	PW	20.07.16
RF	85% ISSUE UPDATED	PW	08.11.16



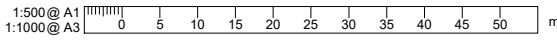
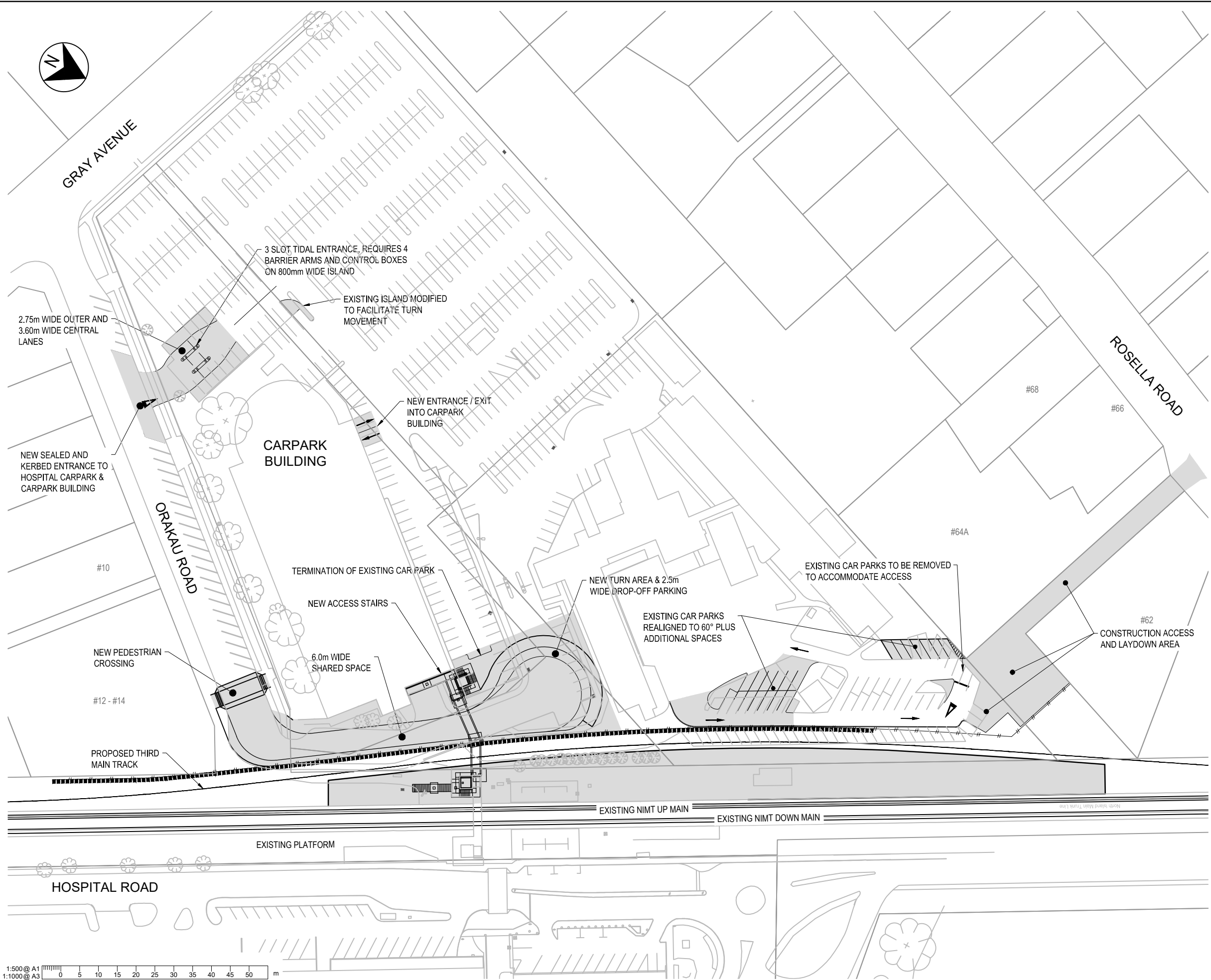
Project		KIWIRAIL MIDDLEMORE (662,600m) TO PUHINUI (659,000m) NEW THIRD MAIN - STAGE 2	
Sheet		RETAINING WALL D1 PLAN AND LONG SECTION LAYOUT 1 OF 2	
Drawn	Designed	Approved	Revision Date
N.BOYTE	A.COOK	T.WILSON	12.04.12
Project No.	Scale	Drawing No.	Sheet No.
1-M9001.86	1:500 @ A1	1/6057/19/5104	224
			Revision
			RF

300 mm
200
100
50
0 10 mm

1:500 @ A1
1:1000 @ A3



LEGEND:	
	LEGAL BOUNDARIES
	EXISTING TRACK
	NEW THIRD MAIN
	EXTENT OF WORKS
	PROPOSED RETAINING WALL
	PROPOSED FENCE



CONSENT ISSUE

REV	DATE	DRAWN	REV'D	APP'D	REVISION	DRAWING NUMBER	REFERENCE DRAWING TITLE
A	14/07/20	MC	TH	MM	ISSUED FOR NOTICE OF REQUIREMENT		

Level 2, Quay Park
12-14 Michells Lane, Parnell
AUCKLAND 1010
NEW ZEALAND

Tel: +64 9 928 5500
Fax: +64 9 928 5501
Web: www.jacobs.com

CLIENT KIWIRAIL		PROJECT THIRD MAIN MIDDLEMORE TO PUHINUI	
DRAWN MC	DRAWING CHECK NB	REVIEWED TH	APPROVED MM
DESIGNED MC	DESIGN REVIEW AC	DATE 14/07/2020	DATE 14/07/2020

TITLE MIDDLEMORE STATION PROPOSED CIVIL LAYOUT PLAN	
SCALE 1:500 (A3)	DRAWING No. 601001-DR-NIMT-CV-383
REV 0	

Project: **KIWIRAIL WIRI TO QUAY PARK**

Prepared for: **Jacobs
Carlaw Park
12-16 Nicholls Lane
Parnell
Auckland 1010**

Attention: **Tim Hegarty**

Report No.: **Rp 001 20200311**

Disclaimer

Reports produced by Marshall Day Acoustics Limited are based on a specific scope, conditions and limitations, as agreed between Marshall Day Acoustics and the Client. Information and/or report(s) prepared by Marshall Day Acoustics may not be suitable for uses other than the specific project. No parties other than the Client should use any information and/or report(s) without first conferring with Marshall Day Acoustics.

The advice given herein is for acoustic purposes only. Relevant authorities and experts should be consulted with regard to compliance with regulations or requirements governing areas other than acoustics.

Copyright

The concepts and information contained in this document are the property of Marshall Day Acoustics Limited. Use or copying of this document in whole or in part without the written permission of Marshall Day Acoustics constitutes an infringement of copyright. Information shall not be assigned to a third party without prior consent.

Document Control

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Draft	-	For team review	18 May 2020	Micky Yang	Siiri Wilkening Craig Fitzgerald
Draft	01	Client review	10 June 2020	Micky Yang	Siiri Wilkening
Draft	02	Section 7 updates	7 July 2020	Craig Fitzgerald	Siiri Wilkening
Issued	03	Update for team comments and measurement results	10 July 2020	Micky Yang	Craig Fitzgerald
Issued	04	Finalised	10 July 2020	-	Craig Fitzgerald

TABLE OF CONTENTS

1.0	INTRODUCTION	4
2.0	SITE LOCATION.....	5
3.0	REGULATORY CONTEXT	6
3.1	Construction Noise and Vibration	6
3.2	Operational Noise and Vibration.....	7
4.0	CONSTRUCTION NOISE AND VIBRATION ASSESSMENT	8
4.1	Overview	8
4.2	Programme	8
4.3	Sequencing of Works.....	9
4.4	Construction Noise	10
4.5	Construction Vibration	12
4.6	Construction Noise and Vibration Management Plan.....	15
5.0	OPERATIONS NOISE AND VIBRATION ASSESSMENT	16
5.1	Overview	16
5.2	Rail Noise.....	16
5.3	Rail Vibration.....	27
6.0	RECOMMENDATIONS	28
6.1	Construction Noise and Vibration	28
6.2	Operational Rail Noise and Vibration.....	29
7.0	CONCLUSION.....	30
APPENDIX A GLOSSARY OF TERMINOLOGY		
APPENDIX B PROPOSED THIRD LINE		
APPENDIX C INDICATIVE NOISE CONTOURS		
APPENDIX D COMPARISON OF RAIL NOISE CRITERIA		
APPENDIX E PREDICTED NOISE LEVELS		

1.0 INTRODUCTION

Marshall Day Acoustics (**MDA**) has been engaged by Jacobs to undertake a noise and vibration assessment of construction and operation of the proposed third rail line between Wiri Junction and Middlemore Station. This section of the railway forms one part of the wider Wiri to Quay Park (**W2QP**) project. The four Packages are:

1. The construction of a 3.6km third railway line (**Third Main**) on the west side of the existing lines between Middlemore Station and Wiri Junction including upgrades and alterations to Middlemore and Papatoetoe Stations;
2. The upgrading of the rail yard at Wiri Junction;
3. The upgrading of the rail yard at Westfield; and
4. The upgrading of the Rail yard at Quay Park.

Our scope is limited to Package 1 only (the **Project**).

The Wiri to Quay Park section of railway is a key link to the national and regional rail network. It carries a mixture of passenger and freight trains. The current twin rail layout has reached maximum capacity during peak periods. Therefore, the installation of a third line is needed to increase capacity and provide resilience. Further detail on the purpose of the Project and its strategic importance to Auckland is detailed in the Assessment of Environmental Effects (**AEE**).

Works include construction of retaining walls and overhead electrified lines, as well as upgrades of Middlemore and Papatoetoe station. Works will also be undertaken on Counties Manukau Hospital Board land at Middlemore to rearrange an existing hospital car park.

Some of the works can only take place when the rail lines are blocked, because trains cannot run on the lines whilst construction is taking place. The blocks will run for extended periods and include public holidays and night times. Typical controls for construction noise and vibration are more stringent during these times, so the mitigation and management strategies employed for the works will be critical to the Project.

Our construction noise and vibration findings are:

- Works within the rail Designation are not controlled by designation conditions. Nevertheless, noise and vibration effects from the works must be reasonable. We have recommended criteria that trigger the need for mitigation and management measures to be implemented.
- Works outside of the Designation are controlled by the rules of the Auckland Unitary Plan (**AUP**).
- We have assumed that the majority of high noise and high vibration works will be carried out during daytime hours where it is safe and practicable. Due to access and safety constraints, there will be works required during the night-time as part of Block of Line works.
- Noise and vibration criteria are predicted to be exceeded at most buildings fronting the alignment to a varying degree. Therefore, mitigation measures will need to be implemented.
- We recommend that a Construction Noise and Vibration Management Plan is prepared prior to the works commencing. This will form a part of the Outline Plan of Work (**OPW**).

We have assessed the rail noise and vibration effects from the proposed new railway line outside of the existing Designation for selected receivers within our recommended effects zone. We have focused only on the effect due to the Third Main being closer to receivers, rather than a change in capacity enabled in the existing Designation due to the Third Main. In summary:

- We have recommended assessment criteria for rail noise and rail vibration enabled by the alteration to the rail Designation; and

- We have predicted rail noise and vibration levels for the operations enabled by the proposed alteration and recommended where mitigation should be investigated for some receivers.
- The Project would have a noticeable adverse effect arising from the change in rail noise and vibration levels. However, with recommended mitigation measures such as noise barriers and/or building upgrades (e.g. ventilation, glazing and/or façade), the rail noise and vibration levels would be reasonable. We understand that these controls will be implemented as part of the OPW for this NoR to achieve reasonable outcomes for noise and vibration effects.

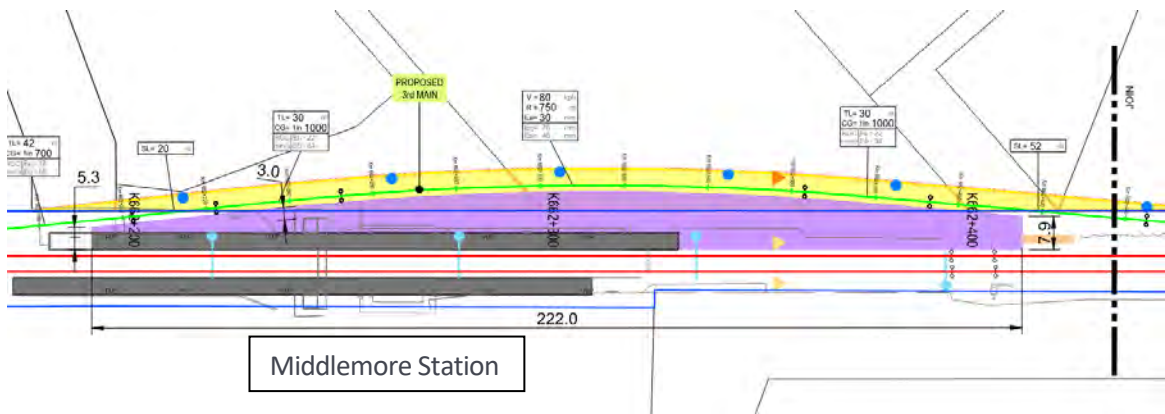
A glossary of terms is attached in Appendix A.

2.0 SITE LOCATION

The proposed Third Main for Package 1 is shown in Appendix B. It is within Designation 6302 and is zoned *Strategic Transport Corridor* by the AUP.

Most of the Third Main will be contained inside of the Designation except for the section shown in Figure 1.

Figure 1: Blue line indicates Designation. Green line indicates proposed new rail line outside Designation



Most of the receivers adjacent to the Designation are zoned *Residential* with others zoned *Business*. Two receivers are zoned *Special Purpose* (Middlemore Hospital and Kings College).

The Third Main will be on the western side of the existing lines, so the western receivers will be closer to any work site. In general, residential receivers on the western side are typically approximately 7 – 10m from the Third Main or a work site. On the eastern side, the typical setback distance is approximately 25 – 30m away. Some retaining works are less than 1m from an existing house. The closest buildings at Middlemore Hospital are at least 60m from the works.

Minor works outside the existing corridor are also proposed at Papatoetoe Station and Bridge Street. However, these works relate to new retaining walls and overhead electrification structures only, and do not result in the rail line moving outside the designation.

Construction works will require temporary occupation of land outside the designation. Closest houses are 10 to 20 metres from the proposed retaining walls. Indicative locations are shown in the figures overleaf.

Figure 2: Papatoetoe Station: Blue line indicates Designation. Turquoise line indicates retaining walls that will be installed along the designation boundary. Pink line indicates temporary occupation during construction

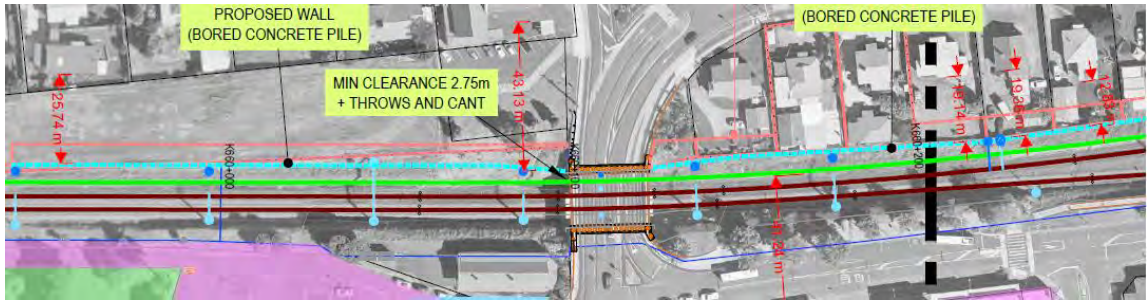
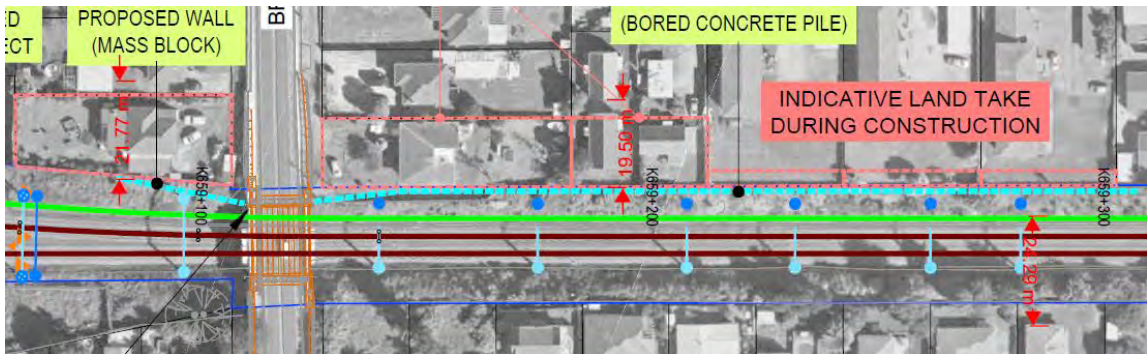


Figure 3: Bridge Street: Blue line indicates Designation. Turquoise line indicates retaining walls that will be installed along the designation boundary. Pink line indicates temporary occupation during construction



Refer the Land Requirement plans in the Planner’s report.

3.0 REGULATORY CONTEXT

The rail designation contains no controls for noise and vibration. However, there is an obligation required under Section 16 of the Resource Management Act (RMA) which states “every person carrying out an activity... shall adopt the best practicable option to ensure that the emission of noise... does not exceed a reasonable level”.

3.1 Construction Noise and Vibration

Construction noise and vibration management is critical to ensure the emissions are reasonable.

The foreword of New Zealand Standard NZS 6803:1999 “Acoustics – Construction Noise” states: “Construction noise is an inherent part of the progress of society. As noise from construction is generally of limited duration, people and communities will usually tolerate a higher noise level provided it is **no louder than necessary, and occurs with appropriate hours of the day**. The Resource Management Act 1991 requires the **adoption of the best practicable option to ensure** the emission of noise from premises does not exceed **a reasonable level**. The Act also imposes a duty on every person to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on by, or on behalf of, that person.”¹

For residual works outside the rail designation, the noise and vibration controls in Chapter E25 of the AUP apply.

The following relevant AUP objectives and policies provide further guidance:

- AUP objectives in E25.2 (1) require that “People are protected from **unreasonable** levels of noise and vibration”, while (4) states: “Construction activities that cannot meet noise and vibration standards are **enabled while controlling duration, frequency and timing** to manage adverse

¹ New Zealand Standard NZS 6803:1999 “Acoustics – Construction Noise”, Foreword

effects". This acknowledges that there are often periods or activities where the construction noise standards cannot be met. The objective is to enable them provided they are no louder than necessary.

- AUP policies in E25.3 (2) require "*Minimise, **where practicable**, noise and vibration at its source or on the site from which it is generated to mitigate adverse effects on adjacent sites*", while (10) states: "*Avoid, remedy or mitigate the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to:*
 - a) *the sensitivity of the receiving environment; and*
 - b) *the proposed duration and hours of operation of the activity; and*
 - c) ***the practicability of complying with permitted noise and vibration standards.***"

This acknowledges the practicability of compliance. A Construction Noise and Vibration Management Plan (**CNVMP**) should address all three elements. Such a CNVMP would be employed through the OPW process.

- The relevant noise and vibration rules are detailed in Sections 4.4.1 and 4.5.1 respectively.
- AUP matters of discretion in E25.8.2 (1) parts (a) and (b) are (note other parts are not relevant to construction noise):
 - a) "*whether activities can be managed so that they **do not generate unreasonable noise and vibration levels** on adjacent land uses particularly activities sensitive to noise*
 - b) *the extent to which the noise or vibration generated by the activity:*
 - i. *will occur at times when disturbance to sleep can be avoided or minimised; and*
 - ii. *will be compatible with activities occurring or allowed to occur in the surrounding area; and*
 - iii. *will be limited in duration, or frequency or by hours of operation; and*
 - iv. *will exceed the existing background noise and vibration levels in that environment and the reasonableness of the cumulative levels; and*
 - v. *can be carried out during daylight hours, such as road works and works on public footpaths*"

A further statement in E25.8.2 (2) is: "***for works in the road or rail corridor, whether the effects on amenity values and sleep quality generated by construction activity in the road or rail corridor are reasonable taking into account the background noise levels.***"

3.2 Operational Noise and Vibration

For rail activities extending outside the existing designation, the noise and vibration controls in Chapter E25 of the AUP apply. There are no noise and vibration criteria in the AUP that apply to rail noise and neither is there a New Zealand standard for such criteria.

The objectives and policies balance the need to protect people from unreasonable levels while enabling essential infrastructure such as road and rail. The most relevant AUP objectives and policies are reproduced below:

- AUP objectives in E25.2 (1) and (2) require that people are protected from **unreasonable** levels of noise and vibration, while (3) states: "*Existing and authorised activities and infrastructure, which by their nature produce high levels of noise, are appropriately protected from **reverse sensitivity effects** where it is reasonable to do so.*"
- AUP policies in E25.3 (1), (2), (4) and (5) are reproduced below (others less relevant):

- 1) **Set appropriate noise and vibration standards** to reflect each zone’s function and permitted activities, while ensuring that the potential adverse effects of noise and vibration are avoided, remedied or mitigated.
 - 2) **Minimise, where practicable, noise and vibration at its source** or on the site from which it is generated to mitigate adverse effects on adjacent sites.
 - 4) Use area or activity specific rules where the **particular functional or operational needs** of the area or activity make such rules appropriate.
 - 5) **Prevent significant noise-generating activities other than roads and railway lines from establishing in or immediately adjoining residential zones.**
- The relevant noise and vibration rules are detailed in Sections 5.2 and 5.3.1 respectively.
 - AUP matters of discretion in E25.8.2 (1) parts (a) and (b) are have already been discussed in Section 3.1 above and are also relevant to operational rail noise and vibration.
 - A further statement in E25.8.2 (3) is: “for reverse sensitivity effects, whether the activity or **infringement proposed will unduly constrain the operation of existing activities.**”

4.0 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

4.1 Overview

The construction assessment relies on the W2QP Business Case Design Report (Rev 2), including project alignment, construction method, programme, sequence and timing. We have supplemented this with representative noise and vibration source data and management assumptions based on MDA experience from similar projects (e.g. Auckland Electrification Project (AEP), Developing Auckland’s Rail Transport (DART), City Rail Link (CRL) and Puhinui Interchange Upgrade).

4.2 Programme

The Third Main construction duration is approximately 44 months (including a 6-month contingency period). The key components of the programme are:

- Civil retaining walls ~15 months
- Pedestrian bridge and Access Provision at Middlemore ~12 months
- Civil construction earthworks and drainage ~12 months
- Overall Programme Physical Works ~36 months

Works would be carried out in a linear fashion. The average completion rate is 100m per month (based on 3.6 km track over and 36-month construction duration). As such, most receivers would only be exposed to high construction noise and vibration levels for a short duration.

The works will generally be undertaken while maintaining an operational rail corridor. To ensure the safety of those involved, activity timing restrictions are categorised as follows:

- **Normal Access:** Works can be undertaken while trains are operating normally.
- **Restricted Access:** Works that can be safely carried out while trains are operating but require rail protection and/or Electrical Safety Observers.
- **Isolation Hours:** Works that cannot be undertaken while trains are operating but can be undertaken in a short timeframe at night.
- **Block of Line (BOL):** Works that cannot be carried out while trains are operating and require a longer duration to complete. Blocks of Line are required to be planned at least 12 months in advance of the work being undertaken and must follow the BOL Planning process.

BOL are required for earthworks and formation activities adjacent to the existing Up Main. Scheduled BOL periods are as follows²:

- Labour weekend 2020
- Christmas-New Year 2020-2021
- Anniversary Weekend 2021
- Easter 2021
- Queen's Birthday 2021

The refined timing of works will be further developed in later design stages and form part of the Outline Plan for Works (**OPW**) for each site. We assume the following:

- Normal Access or Restricted Access works will be undertaken during normal day evening periods due to either proximity of works or implementation of Single Line Running.
- Isolation Hours and BOL works will prioritise high noise and vibration activities before 2230 hrs where practicable (e.g. piling and rail tamping), with the remaining scheduled activities extending across the remaining night-time period if required (e.g. surveying, OLE, signal and utility works).
- Some residual, local, short-term, high noise and vibration activities may be required during the night-time period (e.g. to ensure worker safety or to minimise rail, road or utility disruption). Operating procedures will be implemented, including communication with affected residents and businesses, to minimise any potential disturbance.

4.3 Sequencing of Works

The overall sequence of works for the Third Main can be divided into three parts:

- Wiri Junction – Outside the scope of this assessment
- Puhinui to Middlemore Third Main construction:
 - o Enabling Works – Service diversions and construction access points
 - o Stage 1 – Civils and retaining walls
 - o Stage 2 – Earthworks and drainage
 - o Stage 3 – OLE Foundations and mast erection
 - o Stage 4 – Track laying
 - o Stage 5 – OLE dressing and wiring
 - o Stage 6 – Signals and OLE commissioning
- Middlemore Station:
 - o Enabling Works – Service diversions, carpark rearrangement, and construction access
 - o Stage 1 – Retaining walls
 - o Stage 2 – Bridge works
 - o Stage 3 – Earthworks and drainage
 - o Stage 4 – Platform construction
 - o Stage 5 – Rail systems installation

² Based on Section 1.4 of the W2QP Business Case Design Report (Rev 2) dated 17 September 2019

- o Stage 6 – OLE and signals commissioning

4.4 Construction Noise

4.4.1 Performance Standards

Most works are within the rail designation. It is assumed this includes all necessary night works. As discussed in Section 3.0, the rail designation contains no controls for noise and vibration.

For residual works outside the rail designation (e.g. utility relocations), the noise and vibration controls in Rule E25.6.27 of the AUP applies. Rule E25.6.27.1 requires that construction activities shall meet the relevant noise limits in Table 1. The noise criteria shall apply at 1 metre from the façade of a building that is occupied during the works. Although the duration of the project exceeds 20 weeks we consider that the typical duration noise limits would be appropriate as the works will move in a linear fashion and no one receiver would be exposed to construction noise for more than 20 weeks.

Table 1: Noise limits at occupied buildings sensitive to noise

Time of week	Time period	Noise criteria	
		dB LAeq	dB LAmax
Activities Sensitive to Noise			
Weekdays	0630-0730	60	75
	0730-1800	75	90
	1800-2000	70	85
	2000-0630	50	80
Saturdays	0630-0730	50	80
	0730-1800	75	90
	1800-2000	50	80
	2000-0630	50	80
Sundays and public holidays	0630-0730	50	80
	0730-1800	60	90
	1800-2000	50	80
	2000-0630	50	80
All other buildings			
	0730-1800	75	-
	1800-0730	80	-

However, we consider that the Auckland Unitary Plan Rule E25.6.29 “Construction noise levels for work within the road” is more appropriate rule for benchmarking effects of necessary works associated with a transport corridor (i.e. both within and outside the rail designation, which is classed as a “strategic transport corridor”). More specifically, E25.6.29 (4) relates to “road rehabilitation works that comprise the substantial removal and replacement of the road structural base and pavement in the road”. It refers to the noise limits in E25.6.27 reproduced above, but notes these Standards do not apply where:

- The number of nights where the noise limits are exceeded at any one receiver is 20 days or less;
- High noise activities, such as concrete cutting and breaking, are completed by 10.30pm;
- The works cannot practicably be undertaken during the day, or the requiring authority requires the works to be undertaken at night;
- A works access permit from the requiring authority is provided to Council; and
- A CNVMP is provided to the Council no less than five days prior to the works commencing in accordance with the applicable provisions of Standard E25.6.29 (5).

The construction methodology notes that some construction activities will be required at night to ensure worker safety and/or to minimise disruption to ongoing rail services, as is normal for major road and rail maintenance activities. High noise activities would be minimised at night where practicable. Residual events would typically occur for a short duration on a small number of occasions near any one receiver. These events would generally exceed the 45 dB L_{Aeq} limit at night.

The Australian/New Zealand Standard AS/NZS 2107:2000 “Acoustics – Recommended design sound levels and reverberation times for building interiors” provides recommended design sound levels for dwellings near major roads. This is considered to be equivalent to dwellings adjacent to the rail corridor with freight movements occurring at night. The recommended maximum design limit for sleeping areas is 40 dB L_{Aeq} . Given that a typical lightweight NZ dwelling façade construction provides 20 to 25 decibels noise reduction with the windows closed, this would be equivalent to a maximum external noise level of 60 – 65 dB L_{Aeq} .

We consider that a CNVMP should be prepared in accordance with E25.6.29 (5) as part of the OPW phase. The content of the CNVMP is discussed in Section 4.6. It should identify any predicted or measured exceedance of 60 dB L_{Aeq} at night. This should then trigger engagement with potentially affected parties to understand what additional mitigation or management measures are necessary. A similar approach was undertaken for the Auckland Electrification Project (AEP), City Rail Link (CRL) and recent Puhinui Interchange Upgrade projects.

4.4.2 Predicted noise levels

Table 2 provides representative noise levels for activities based on previous experience on rail projects without mitigation.

Table 2: Noise levels of identified machinery – No mitigation

Equipment	Sound Power Level (dB L_{Aeq})	Noise Level (dB L_{Aeq})			Setback (m)	
		10 m	20 m	50 m	75 dB L_{Aeq}	60 dB L_{Aeq}
Vibratory sheet piling	116	91	85	76	52	209
Rail Tamper/Regulator	116	91	85	76	52	209
Bored/screw piling	103	78	72	63	14	63
Roller (static or vibratory)	103	78	72	63	14	63
Excavator (12T)	103	78	72	63	14	63
Excavator (8T)	102	77	71	62	13	58
Mobile Crane (35T)	98	73	67	58	8	40
Truck idling	91	66	60	51	4	20

We assume that temporary noise barriers will be used where a construction noise limit is predicted to be exceeded (Section 4.4.1) and the barriers would noticeably reduce the construction noise level.

They should be installed prior to works commencing in that area and maintained throughout the works.

Effective noise barriers typically reduce the received noise levels in Table 2 by 10 decibels where they block line-of-sight from source to receiver, reducing the setbacks in in Table 2 by approximately 66% (e.g. 30m without screening versus 10m with screening). Most nearby dwellings are single storey, so noise barriers should generally be effective.

Construction noise contours for representative activities and locations are included in Appendix C. Construction noise limits will generally be exceeded at any time (day, night, and weekend) depending on the activity, at many receivers adjacent to the Third Main. This is because the source to receiver distances are typically short (7 to 10m average for the receivers west of the Third Main).

The frequency and magnitude of exceedances will depend on where the high-noise machines are working, whether they are working simultaneously, and whether they are being operated considerably.

4.5 Construction Vibration

4.5.1 Performance Standards

As discussed in Section 3.0, the rail designation contains no vibration controls.

For residual works outside the rail designation, the vibration controls in Rule E25.6.30.1 of the AUP applies. Part (a) of the rule relates to cosmetic building damage, while part (b) relates to amenity effects.

Standard E25.6.30.1 (a) of the AUP states that construction vibration must be controlled to ensure it does not exceed the limits set out in *German Standard DIN 4150-3:1999 "Structural Vibration - Effects of Vibration on Structures"*. The limits are designed to avoid cosmetic damage, such as cracking plaster, and are much lower than those that cause structural damage. The most stringent limits are summarised in Table 3. There are no heritage buildings identified nearby, so Line 3 criteria are disregarded hereafter.

Table 3: DIN – 4150 Cosmetic Building Damage Vibration Thresholds

Line	Type of structure	Guideline values for velocity, v_i , in mm/s of vibration in horizontal plane of highest floor, at all frequencies
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10
2	Dwellings and buildings of similar design and/or occupancy	5
3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings under preservation order)	2.5

People can be disturbed at vibration levels significantly below the cosmetic building damage thresholds above. The vibration amenity limits from E25.6.30.1(b) are summarised in Table 4. The rule allows for up to three days of intensive daytime works with a vibration limit of 5mm/s provided receivers within 50 m of the works receive prior communications.

We note that the night-time limit of 0.3mm/s is already exceeded by existing train movements at some receivers.

Table 4: Occupied Building Amenity Vibration Limits

Receiver	Period	Peak Particle Velocity Limit (mm/s)
Occupied activity sensitive to noise (e.g. dwelling, hospitals, schools)	Night-time 10pm to 7am	0.3
	Daytime 7am to 10pm	2
Other occupied buildings	At all times	2

As per Section 4.4 for noise, we consider that the Auckland Unitary Plan Rule E25.6.29 “*Construction noise levels for work within the road*” is more appropriate rule for benchmarking effects of necessary works associated with a transport corridor (i.e. both within and outside the rail designation). More specifically, E25.6.29 (4A) relates to vibration. It removes the obligations relating to vibration amenity in E25.6.30 (b) where:

- A works access permit from the requiring authority is provided to Council; and
- A CNVMP is provided to the Council no less than five days prior to the works commencing in accordance with the applicable provisions of Standard E25.6.29 (5).

Additionally, and similarly to Section 4.4, we consider that a CNVMP should be prepared E25.6.29 (5) as part of the OPW phase. The CNVMP content is discussed in Section 4.6. It should identify any predicted or measured exceedance of the vibration standards. This should trigger engagement with potentially affected parties to understand what additional mitigation or management measures are necessary.

4.5.2 Predicted Vibration Levels

Table 5 provides representative vibration levels for activities with the potential to generate high vibration levels. It includes predicted setback distances from the source to achieve compliance with the relevant criteria. Where practicable, none of these activities should be undertaken at night to minimise vibration amenity effects.

Table 5: Indicative distances to comply with vibration limits at building foundations

Equipment	Amenity Setback (m)		Cosmetic Building Damage Setback (m) ³	
	Night 0.3 mm/s PPV	Day 2 mm/s PPV	Residential 5 mm/s PPV	Commercial 10 mm/s PPV
Sheet Piling	>100	43	11	4
Vibratory roller	>100	38	14	6
Rail Tamper	25	12	5	2

Excavators have not been included in Table 5. Whilst they can produce vibration in various ways, e.g. dropping heavy objects, running over ledges, snagging submerged items etc., most of the time they are unlikely to generate significant vibration. Vibration events can be minimised or avoided through considerate use and as part of management protocols.

All *Business* zoned sites are outside of the cosmetic and daytime amenity setback distances. However, there are many Residential zoned sites within both.

Where the cosmetic building damage thresholds are predicted to be exceeded, we recommend:

³ Based on regression analysis of available vibration measurements, plus a 100% safety factor

- KiwiRail makes every practicable effort to consult with those receivers to understand their sensitivities; and
- Carry out a pre-construction building condition survey prior to commencing activities with the potential to exceed the cosmetic building damage thresholds; and
- Monitoring undertaken to verify the predicted levels and compliance (or otherwise)

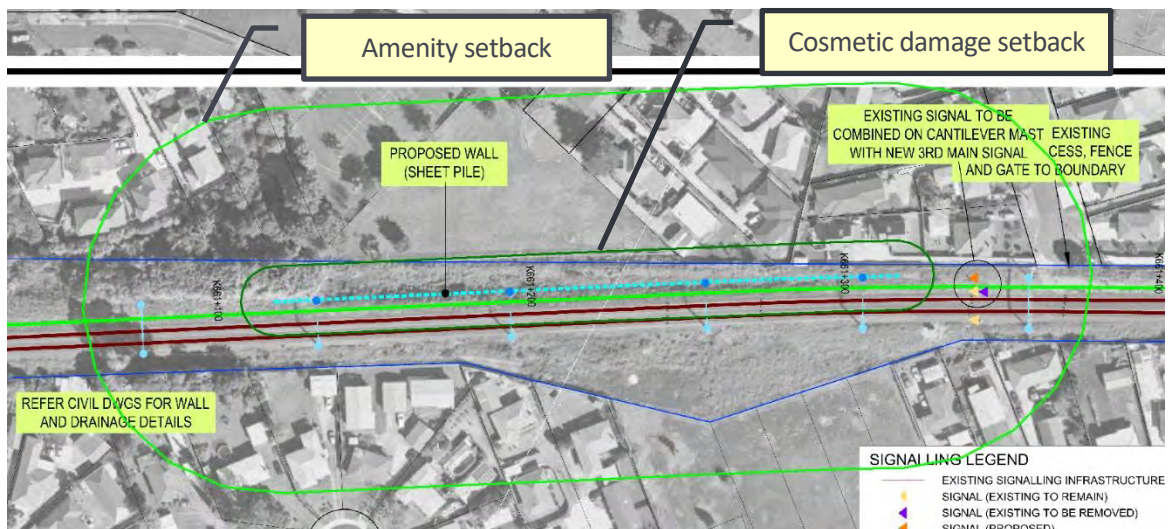
If measurements confirm an exceedance of the cosmetic building damage thresholds, then the works should stop, and a condition survey carried out. If no new damage has been found, then the vibration limit at that receiver can be increased. If attributable damage is identified, then the contractor must commit to repairing the damage. A post-construction building condition survey should also be carried out to ensure all potential damage has been identified.

While the primary vibration concern is typically cosmetic building damage, people may be disturbed at significantly lower levels. Potentially affected parties should be informed about the vibration levels they may experience, and assured that vibration damage can only occur at magnitudes well above the threshold of perception. Particular focus should be to managing night-time effects.

Sheet Piling in Existing Corridor

Bored piling methods produce low vibration levels and are proposed for most retaining works. However, sheet piling is proposed to create a wall between K661 + 100 and K661 + 400 within the designation. As such, management of these will be covered by the OPW. Figure 4 shows the cosmetic damage and daytime amenity setback contours for sheet piling. We predict that there is potential for an exceedance of the cosmetic building damage limit at four dwellings: 1 and 2 Portage Road, and 14B and 16 Gordon Road. Where practicable, we recommend that an alternative method is used (e.g. bored piling) within 11m of these dwellings, noting that these works will be addressed by the future resource consent and OPW (i.e. they are inside the existing rail designation and are not within the scope of the NoR).

Figure 4: Vibration contours for sheet piling



Vibratory Rolling

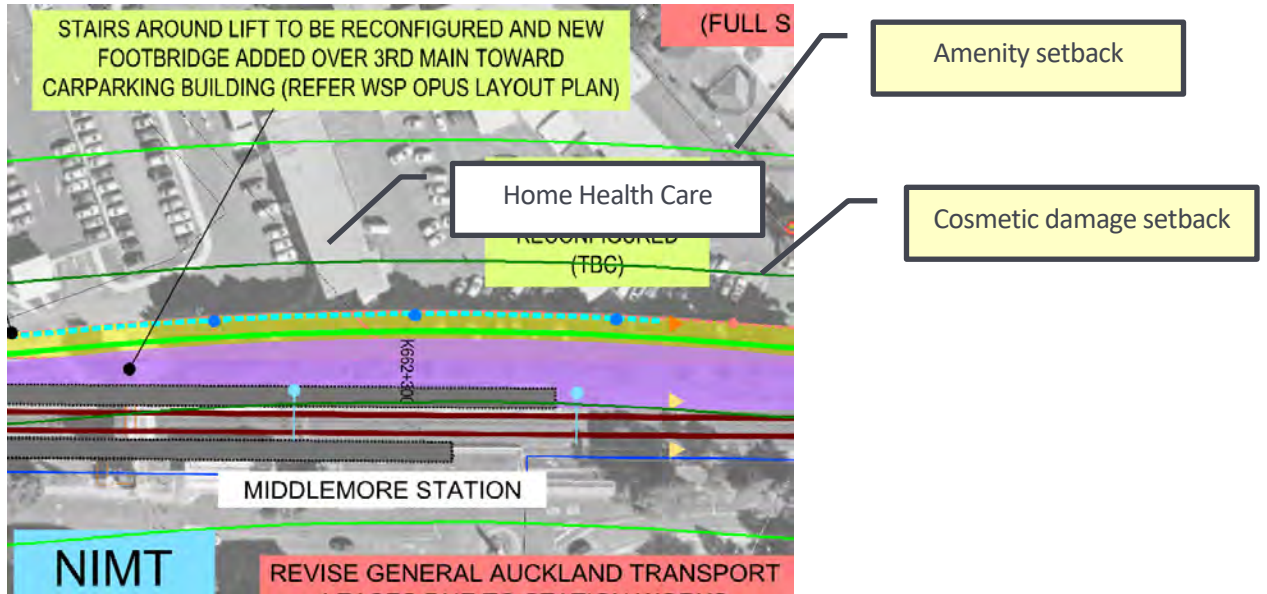
We predict that there will be no exceedance of the cosmetic building damage limits at any receiver east of the Third Main. However, there is predicted to be an exceedance of the daytime amenity criterion of 2mm/s for the front row of dwellings that face the railway lines.

West of the proposed Third Main, we predict that there is potential for exceedance of the cosmetic building damage thresholds within 14m. This captures many of the front row of properties that face the railway along Kenderdine Road, Ashlynn Avenue, Gordan Road, Portage Road, Nogat Avenue,

Gray Avenue, and Barrie Avenue. In general, exceedances of the daytime amenity criterion would also be confined to this front row of dwellings, but may extend to the second row in Gordan Road, Portage Road, Nogat Avenue, and Gray Avenue. Effects will need to be managed through the OPW.

The healthcare facility (Home Health Care which is a part of Middlemore Hospital) at 38 Orakau Road is in very close to the Third Main. Works may be as close as 6m from the closest building. At this setback distance, vibration levels are predicted to be very high (>10 mm/s), and alternative construction methods may need to be implemented. Potential mitigation and management measures are discussed in Section 5.6.

Figure 5: Vibration contours for Home Health Care



Rail Tamping

We predict that compliance with the cosmetic building damage limit can be achieved at all buildings except at 12 Orakau Road. This building appears to be just within the 5m setback distance.

The daytime amenity criterion is predicted to be exceeded at a number of dwellings. The catchment is similar to that of vibratory rolling, albeit slightly smaller.

Construction vibration management during rail tamping will be covered by the existing NoR.

4.6 Construction Noise and Vibration Management Plan

There are predicted exceedances of the noise and vibration standards for several nearby receivers. However, these are considered reasonable provided they are of limited duration and BPO measures are implemented through a CNVMP to avoid, remedy and mitigate the effects as far as practicable.

A CNVMP is recommended as a designation condition (Section **Error! Reference source not found.**). The objectives of the CNVMP are:

- Identify and adopt the Best Practicable Option (BPO) for the management of construction noise and vibration;
- Define the procedures to be followed when construction activities cannot comply with the noise and vibration standards;
- Inform the duration, frequency and timing of works to manage disruption;
- Require engagement with affected receivers and timely management of complaints; and

The CNVMP must include the relevant measures from:

- NZS 6803:1999 "Acoustics - Construction Noise" Annex E2 "Noise management plans" and;
- DIN 4150-3:1999 "Structural vibration - Part 3 Effects of vibration on structures" Appendix B "Measures for limiting the effects of vibration".

These include, but are not limited to the following components:

- The performance standards that must, as far as practicable, be complied with to enable a consistent approach for adaptive management protocol
- Predicted noise and vibration levels for relevant equipment and/or activities
- Construction noise and vibration mitigation and management measures
- Noise and vibration monitoring requirements
- Communication, consultation and complaints response procedures

5.0 OPERATIONS NOISE AND VIBRATION ASSESSMENT

5.1 Overview

Two lines currently operate through the Project extent. They carry a mixture of passenger and freight trains. The installation of the third line is needed to increase capacity and provide resilience.

The majority of the Third Main will be contained inside of the Designation except for a section near Middlemore Station, described in Section 2.0. The new line at this location extends west over part of the existing hospital car park (*Special Purpose – Healthcare Facility and Hospital Zone*) and one property to the north used for residential purposes (*Business – Mixed Use Zone*). There will be some land take, the scope of which is to be confirmed. Our assessment is limited to this change, and its effect on the existing environment.

Elsewhere, the Third Main will be west of the existing lines, so rail operations on the new line will be closer to the receivers on that side. Furthermore, the new line will likely enable express and freight trains to bypass the stations, potentially at higher speeds.

5.2 Rail Noise

5.2.1 Auckland Unitary Plan

As discussed in Section 3.0, there are no noise limits specified in the existing designation or applicable to the underlying Strategic Transport Corridor zone.

For new rail activities near Middlemore Station that extend outside the existing rail designation, the relevant noise controls in AUP Rule E25.6 apply. These rules specifically exclude noise from road traffic movements, and a similar exclusion for rail movements would be appropriate if the noise effects of the new designation extension are reasonable. The determination of what is reasonable noise from rail movements is addressed in the following sub sections.

In our opinion, the noise limits should apply to other station activities in the Designation extension, such as the station PA system and mechanical services. However, we consider the *Residential Zone* rules are too stringent for this rail corridor interface.

New Zealand Standard NZS 6802:2008 "Acoustics - Environmental Noise" Section 8 (*Guidelines for the protection of health and amenity*) sets guidance for residential upper noise limits of 55 dB L_{Aeq} during the daytime and 45 dB L_{Aeq} during the night. Based on the existing daytime background noise levels (48 to 51 dB L_{A90} in Table 1 in Section 5.2.8) it is considered that these upper limits would be appropriate for acoustic design of any station modifications within designation extension, including mechanical plant and PA system.

Table 6 overleaf summarises the permitted noise limits for the relevant receiving zones.

These rules specifically exclude noise from road traffic movements, and a similar exclusion for rail movements would be appropriate if the noise effects of the new designation extension are reasonable. The determination of what is reasonable noise from rail movements is addressed in the following sub sections.

In our opinion, the noise limits should apply to other station activities in the Designation extension, such as the station PA system and mechanical services. However, we consider the *Residential Zone* rules are too stringent for this rail corridor interface.

New Zealand Standard NZS 6802:2008 “Acoustics - Environmental Noise” Section 8 (*Guidelines for the protection of health and amenity*) sets guidance for residential upper noise limits of 55 dB L_{Aeq} during the daytime and 45 dB L_{Aeq} during the night. Based on the existing daytime background noise levels (48 to 51 dB L_{A90} in Table 1 in Section 5.2.8) it is considered that these upper limits would be appropriate for acoustic design of any station modifications within designation extension, including mechanical plant and PA system.

Table 6: Maximum noise levels permitted in various zones

Zone	Time	Noise Limit (dB L_{Aeq})
Strategic Transport Corridor zone	-	None
Residential Zones (E25.6.2)	Monday to Saturday 0700 – 2200 hrs Sunday 0900 – 1800 hrs	50 dB L_{Aeq}
	All other times	40 dB L_{Aeq} 75 dB L_{AFmax}
Business – Mixed Use Zone (E25.6.8)	0700 – 2300 hrs	65 dB L_{Aeq}
	2300 – 0700 hrs	55 dB L_{Aeq} 65 dB L_{eq} (63Hz) 60 dB L_{eq} (125Hz) 75 dB L_{AFmax}
Special Purpose – Healthcare Facility and Hospital Zone (E25.6.13)	Monday to Saturday 0700 – 2200 hrs Sunday 0900 – 1800 hrs	55 dB L_{Aeq}
	All other times	45 dB L_{Aeq} 75 dB L_{AFmax}

5.2.2 KiwiRail Reverse Sensitivity Guidelines

KiwiRail has a preferred set of criteria to avoid reverse sensitivity effects from new noise sensitive activities establishing close to existing rail lines. The Guidelines do not have statutory weight unless adopted by a District Plan. They have not been included in the AUP. In summary, these guidelines:

- Are recommended to apply to buildings within 100 meters of a railway corridor
- Are based on a standardised external rail noise level of 70 dB $L_{Aeq(1h)}$ at 12 metres from the closest track
- Require an internal noise level of 40 dB $L_{Aeq(1h)}$ to be achieved inside any noise sensitive activity and inside habitable rooms except bedrooms
- Require an internal noise level of 35 dB $L_{Aeq(1h)}$ to be achieved inside any bedroom

Reverse sensitivity guidelines usually apply to new activities establishing in an existing area. These values indicate what KiwiRail would like new neighbouring noise sensitive activities and dwellings to achieve in order to avoid reverse sensitivity effects. In this instance, we consider it is reasonable that these criteria can be used as a basis to assess the significance of the noise effects of the alteration to the railway designation boundary and closer proximity to dwellings in this location.

5.2.3 New Zealand Rail Noise Performance Standards

New Zealand does not have standard rail noise assessment criteria. Most rail designations do not have any noise performance standards at all. There are only a small number of new rail lines in New Zealand where a noise limit has been applied to the project. An example is the Marsden Rail spur, where the following noise limits were applied to the new rail line:

- For existing low noise areas (where the ambient noise level is less than 50 dB $L_{Aeq(24h)}$) an external noise limit of 60 dB L_{dn}
- For existing high noise areas (where the ambient noise level is more than 50 dB $L_{Aeq(24h)}$) an external noise limit of 65 dB L_{dn}
- A night-time maximum noise limit at the façade of 80 dB L_{AFmax} (in order to avoid sleep disturbance)

5.2.4 International Rail Noise Performance Standards

The relevant project criteria depend on the stage of the railway development (i.e. if an existing line is to be redeveloped or if a new line is to be constructed).

International criteria may be applied to existing or altered railway lines (such as in Switzerland) or may be used to determine when mitigation actions need to be implemented to reduce noise levels (such as in Denmark, Switzerland, Norway, and the UK). In most countries, the criteria are protected in regulations or Standards. In the majority of situations, the noise criteria for a new railway line is 5 decibels more stringent than the criteria for an alteration to an existing railway line.

Appendix D has been extracted from the NSW EPA Rail Infrastructure Noise Guideline⁴ document which provides a comparison across a wide range of countries. Two examples are expanded further in the following subsections. They set out the situations when mitigation investigations may be required to be carried out due to an alteration of an existing railway line.

British Context

The Calculation of Railway Noise (**CRN**) is the UK procedure for measurement and assessment of railway noise. CRN is similar to the Calculation of Road Traffic Noise, which is the calculation method referenced by NZS6806 (the New Zealand road noise standard). CRN provides reference noise levels at 25m from the nearside edge of the track, plus a set of corrections for rolling stock type, speed, track ballast etc. The KiwiRail guidelines provide a simpler set of assumptions at 12m but is similar in concept.

The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 is UK legislation that requires building sound insulation for dwellings that are affected by noise from new or altered railways (or roads). It is reliant on CRN for calculation of the maximum façade noise levels. For an existing dwelling to qualify, the following conditions must be met:

- Day (6am – midnight): 68 dB L_{Aeq} and increase of 1 dBA
- Night (midnight – 6am): 63 dB L_{Aeq} and increase of 1 dBA

Australian Context

The Victorian State Government 'Passenger Rail Infrastructure Noise Policy' sets policy that "aims to help transport planners and communities to understand rail noise and balance the benefits of new passenger rail with the impacts on those living nearby". It applies specifically to new or altered passenger railway operations. The policy does not cover impacts from existing passenger or freight

⁴ <https://www.epa.nsw.gov.au/resources/noise/20130018eparng.pdf>

operations. Mitigation investigation thresholds for redevelopment of existing passenger rail infrastructure are as follows:

- Day (6am – 10pm): 65 dB L_{Aeq} and increase of 3 dBA, or 85 dB L_{AFmax} and increase of 3 dBA
- Night (10pm – 6am): 60 dB L_{Aeq} and increase of 3 dBA, or 85 dB L_{AFmax} and increase of 3 dBA

The NSW Environmental Protection Agency ‘Rail Infrastructure Noise Guideline’ specifies noise and vibration trigger levels for assessing heavy and light rail infrastructure projects to protect the community from the adverse effects of noise and vibration from rail infrastructure projects. The guidelines distinguish between new and redeveloped rail line. Mitigation investigation thresholds for redevelopment of existing heavy rail infrastructure are as follows:

- Day (7am – 10pm): 65 dB L_{Aeq} and increase of 2 dBA, or 85 dB L_{AFmax} and increase of 3 dBA
- Night (10pm – 7am): 60 dB L_{Aeq} and increase of 2 dBA, or 85 dB L_{AFmax} and increase of 3 dBA

5.2.5 Changes in Rail Noise Level

The subjective impression of changes in noise can generally be correlated with the numerical change in noise level. While every person reacts differently to noise level changes, research shows a general correlation between noise level changes and subjective responses⁵. Table 7 shows indicative subjective responses to explain the noise level changes discussed in this report. From experience, we have found that the subjective perception of a noise level change can be translated into an RMA effect. This effect is based on people’s annoyance reaction to noise level changes.

Table 7: Noise level change compared with general subjective perception

Noise level change	General subjective perception ⁶	Impact ⁷
1–2 decibels	Insignificant/imperceptible change	Negligible
3–4 decibels	Just perceptible change	Slight
5–8 decibels	Appreciable to clearly noticeable change	Moderate
9–11 decibels	Halving/doubling of loudness	Significant
>11 decibels	More than halving/doubling of loudness	Substantial

The perception of these noise level changes generally applies to immediate changes in noise level, and generally relate to road traffic noise rather than rail noise. Rail is not a consistent source as is the case for roads with traffic volumes of more than 2,000 vehicles per day. Therefore, people react differently to the change in noise level. Each rail pass generally results in a similar noise level, but it is the number of rail passes that affects the overall noise level. Between each rail pass, there is generally no noise from the rail line.

We acknowledge that people may subjectively have an annoyance reaction to a greater or lesser degree, depending on their perception of the Project, however these individual and subjective

⁵ For instance, LTNZ Research Report No. 292: Road traffic noise: determining the influence of New Zealand Road surfaces on noise levels and community annoyance, Table 18.

⁶ Based on research by Zwicker & Scharf (1965); and Stevens (1957, 1972).

⁷ The descriptions in this column are based on our understanding of the perception in change in noise level. We have used these descriptions for several roading projects to explain the effects in RMA terms.

variances are not used as a basis for assessing and controlling noise effects – instead an objective approach based on population level sensitivities is used.

Noise is measured on a logarithmic scale, meaning that a doubling in train numbers results in a noise level increase of 3 decibels, a just-perceptible change. A tenfold increase in rail numbers would result in a noise level increase of 10 decibels, which would sound twice as loud.

5.2.6 Recommended Noise Assessment Criteria

Based on the discussions in the preceding sub-sections, we recommend the following noise management thresholds be applied to this Project:

- Day (0700 – 2200): 65 dB L_{Aeq} and increase of 3 dBA, or 85 dB L_{AFmax} and increase of 3 dBA
- Night (2200 – 0700): 60 dB L_{Aeq} and increase of 3 dBA, or 85 dB L_{AFmax} and increase of 3 dBA
- Applied at the façade of any dwelling or care facility within 100m of any new railway line outside of the existing designation. This captures any new rail activity outside of the designation and the effect from this.
- Where this criterion cannot be complied with, we recommend mitigation either in the form of a noise barrier (where this is practicable) or improved sound insulation and/or mechanical ventilation to achieve an internal noise level of no more than:
 - 40 dB $L_{Aeq(0700 - 2200)}$ and 35 dB $L_{Aeq(2200 - 0700)}$ OR
 - 60 dB L_{AFmax} at all times

This recommendation is based on several elements:

- The 100m effects zone is the setback distance in KiwiRail’s reverse sensitivity guideline. This defines the effects zone and enables identification of relevant affected parties.
- The limits are based on the Victorian noise limits. We consider that these are reasonable limits to protect amenity without being prohibitively stringent.
- The increase in noise level trigger aligns with the subjective response in Table 7.
- The daytime/night-time periods are aligned with the Residential Zone weekday noise rules.
- The internal noise limits are based on the KiwiRail Reverse Sensitivity Guidelines, albeit applied over the night-time period rather than the 1-hour period. Additionally, our recommended internal limits are required only if the external noise limit is exceeded as well.
- Consistency with noise limits of other rail projects and the Port operations. The 60/65 dB L_{Aeq} day/night criteria are also comparable to the 65 dB L_{dn} threshold used by the Marsden spur consent and for the Port Inner Noise Control Boundary for port operations (based on the New Zealand Port Noise Standard NZS6809).

5.2.7 Noise Sensitive Receivers

There are a number of noise sensitive receivers within the effects zone (refer Figure 6). These include those listed below:

- 37, 52, 54, 56, 58, 60, 62, 64A, 3/64A, 66, 68, 1/70, 72, 4/72 Rosella Road (dwellings)
- 8, 10, 10A, 12 Orakau Road (dwellings)
- Middlemore Hospital and Home Health Care

Figure 6: Yellow area showing rail effects zone (i.e. 100m from rail Designation change shown in green)



5.2.8 Existing Noise Environment

We have based this section on two sets of measurements. One carried out for a recent rail project on 17 January 2019 between 1350 and 1510 hrs. We consider that those measurements can be used for this Project as well. Measurement locations for those are shown in Figure 7 overleaf and Table 1 overleaf shows the results at those locations.

The second set of measurements were carried out on 17 June 2020 between 1130 and 1350 hrs. Measurement positions are shown in Appendix B and results are presented in Table 1. At the same time, we had set up a long-term noise monitor at Middlemore Station at MP5 shown in Figure 6 (picture in Appendix B) to measure the daily variation over a week. MP5 was approximately 9.5m from the closest rail. In summary, we find that the average levels at MP5 were:

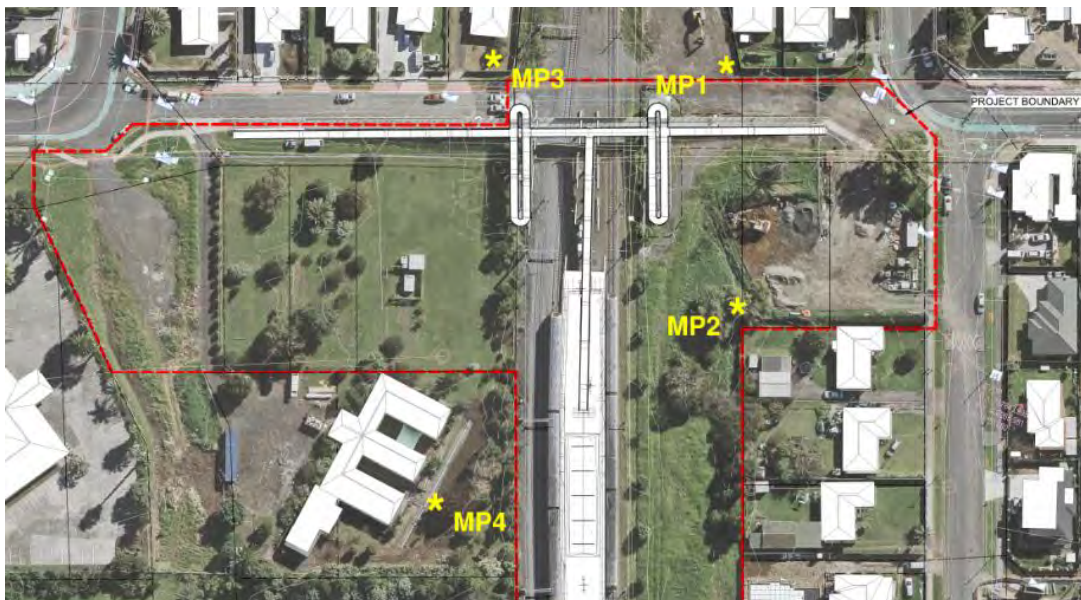
- Daytime (0700 – 2200 hrs) 65 dB L_{Aeq} 99 dB L_{AFmax}
- Night-time (2200 – 0700 hrs) 63 dB L_{Aeq} 97 dB L_{AFmax}

The noise environment at Middlemore Station within 9.5m of the closest existing rail is at or above our recommended thresholds in Section 5.2.6. Therefore, mitigation eligibility will likely depend on the change in noise level due to the new railway line being closer to receivers only.

Table 8: Measured Noise Levels

Position	Location	Noise Level (dB)			Comment
		L _{AFmax}	L _{Aeq}	L _{A90}	
Measurement Set 1 - Puhinui Station					
MP1	Outside corner of fence line at 8 Cambridge Terrace	81	68	50	Train movement (including one freight) and planes, distant traffic
MP2	Outside corner of fence line at 5 Clendon Avenue	67	55	51	Train movement and planes, distant traffic
MP3	Outside fence line of 203 Puhinui Road	79	62	51	Train movement and planes, distant traffic
MP4	East façade/playground area of Te Kohanga Reo Childcare Centre	82	65	48	Train movements and planes; conversations, distant traffic
Measurement Set 2					
MP5	Southern end of Middlemore Station but measured on western platform	94	69	52	Train movements (mostly passenger electric coming into or leaving station with one freight movement straight through), distant traffic, occasional announcement
MP6	Gordon Park	86	66	42	Train movements (mostly passenger electric with one freight), distant traffic, distant construction, birds
MP7	Northern end of Papatoetoe Station but measured on Shirley Road	89	65	48	Train movements (mostly passenger electric coming into or leaving station with one freight movement straight through), traffic on Shirley Road

Figure 7: Measurement Locations



5.2.9 Predicted Rail Noise Levels

The propagation of rail noise is affected by multiple factors, amongst them:

- Terrain elevations, including shielding from intervening terrain and exposure due to elevation;
- Ground condition, including absorptive ground such as meadows or reflective ground such as water; and
- Atmospheric conditions, including wind or temperature inversions.

Because of the multiple factors and their interaction, computer noise modelling is a vital tool in predicting rail noise impacts. Modelling enables a comprehensive and overall picture of noise impacts to be produced, taking into consideration all the factors potentially affecting noise propagation.

We used the software SoundPLAN, which is an internationally recognised computer noise modelling programme. In summary, SoundPLAN uses a three-dimensional digital topographical terrain map of the area as its base. In addition, we entered data into the model for existing buildings and structures within the assessment area. We digitised rail noise sources, with rail tracks located on the terrain file.

The SoundPLAN model uses the calculation algorithms of ISO 9613. The calculation algorithms take account of all factors set out above, including relevant atmospheric and ground conditions within appropriate parameters.

We have assumed the following as model inputs:

- Rail speed travelling past Middlemore station of 80 km/h for the existing rail lines and the future scenario with the Third Main. We have not taken into account trains stopping at Middlemore as generally, pass-by events are louder than trains coming to a stop and starting off again
- The Third Main will be 0.5m above the existing terrain
- Night-time:
 - o 13 freight movements (based on movement data supplied for monitoring period):
 - For the current scenario, we have assumed that seven travels north, and six travels south
 - For the future scenario, we have assumed that all travel along the Third Main (this is the most conservative assumption, allowing for all trains to travel on the line closest to the receivers)
 - o 14 commuter train movements on each of the existing lines for both the current and future scenarios
- Daytime
 - o 22 freight movements (based on movement data supplied for monitoring period):
 - For the current scenario, we have assumed that 11 travel north, and 11 travel south
 - For the future scenario, we have assumed that all travel along the Third Main
 - o 115 commuter train movements on each of the existing lines for both the current and future scenarios
- Freight train sound power level of 133 dB L_{WA} (based on measurements)
- Commuter train sound power level of 116 dB L_{WA} when travelling at speed (i.e. 80 kph) trains. Slower moving trains are around 105 dB L_{WA} (based on measurements). We have used the trains travelling at speed as a conservative approach.

- Note that we have not considered any increase in intensity/capacity due to the Third Main. We are only looking at change in effects from the change in alignment (i.e. the effect from having a railway line outside the existing Designation move closer to buildings at Middlemore Station).

We have assessed noise effects at all buildings noted in Section 5.2.7 above. We have shown predicted noise levels for all buildings for the existing and future scenarios in Table 9 and Table 10 overleaf. The locations of these dwellings are shown in the drawings in Figure 6.

We have produced noise contour plans in Appendix E. Contours are calculated in SoundPLAN by interpolating many individual points. Therefore, noise contour maps should not be used to “read” noise levels for specific locations. Individual noise levels for each building are the receiver noise levels in the tables shown overleaf.

In addition, we show the noise level change when comparing the existing and future rail noise scenarios, in the subjective response bands.

5.2.10 Assessment of Rail Noise Levels

This section of the report describes the assessment of rail noise effects from the Project against the criteria recommended in Section 5.2.6, at the receivers listed in Section 5.2.7.

To calibrate the model, we compared the predicted noise level using our measured sound power levels above and supplied train control graphs for both the night-time (17 June 2200 hrs to 18 June 0700 hrs) and daytime (18 June 0700 hrs to 2200 hrs) to our measurement at MP5 (Middlemore Station). We find that the difference is within 3 decibels. Therefore, we consider that the model is acceptable for predicting train noise.

Current noise levels at the facades are predicted to range from 38 to 63 dB L_{Aeq} during the night-time and 39 to 63 dB L_{Aeq} during the daytime at the assessment receivers. In both cases, 12 Orakau Road is predicted to receive the highest noise levels.

We predict that seven buildings will be eligible for mitigation. Mitigation options may include construction of a noise barrier, mechanical ventilation, and/or building envelope upgrades such as improved window seals or glazing. The option selected for a receiver will depend on the final design of the railway and outcome of engagement with the owners of buildings. As such, we have not recommended a specific option at this stage. With mitigation measures in place as required for selected buildings, we consider the noise effects from rail noise can be controlled to a reasonable level at all other properties.

With respect to the L_{AFmax} criterion, these are often caused by track squeal noises rather than horns, which are used near level crossings. We measured events of up to 94 dB L_{AFmax} during train passings (highest event was caused by freight train south-bound; commuter trains were up to 78 dB L_{AFmax}). Based on this, we predict that there would be a change of up to 12 decibels due to the Third Main outside of the existing Designation. This triggers our recommended threshold for mitigation and applies at receivers already identified in the tables above.

Table 9: Predicted noise levels – night-time

PPF Address	Existing	Future	Noise level change (range across the façades)	Mitigation options recommended to be considered (i.e. noise barrier, ventilation, building envelope upgrade)
	dB LAeq(night)	dB LAeq(night)	dB	
37 Rosella Road	48	49	1	None Required
52 Rosella Road	62	67	5	Mitigation required
54 Rosella Road	57	60	3	Mitigation required
56 Rosella Road	55	57	2	None Required
58 Rosella Road	56	59	3	None Required
60 Rosella Road	58	62	4	Mitigation required
62 Rosella Road	54	57	3	None Required
64A Rosella Road	53	56	3	None Required
3/64A Rosella Road	56	60	4	Mitigation required
66 Rosella Road	48	50	2	None Required
68 Rosella Road	42	42	0	None Required
1/70 Rosella Road	38	39	1	None Required
72 Rosella Road	40	43	3	None Required
4/72 Rosella Road	38	41	3	None Required
8 Orakau Road	46	47	1	None Required
10 Orakau Road	47	49	2	None Required
10A Orakau Road	59	63	4	Mitigation required
12 Orakau Road	63	69	6	Mitigation required
Home Health Care	59	68	9	Mitigation required
Middlemore Hospital	57	58	1	None Required

Table 10: Predicted noise levels – daytime

PPF Address	Existing	Future	Noise level change (range across the façades)	Mitigation options recommended to be considered (i.e. noise barrier, ventilation, building envelope upgrade)
	dB LAeq(night)	dB LAeq(night)	dB	
37 Rosella Road	48	50	2	None Required
52 Rosella Road	62	68	6	Mitigation required
54 Rosella Road	58	61	3	None Required
56 Rosella Road	55	58	3	None Required
58 Rosella Road	56	60	4	None Required
60 Rosella Road	58	63	6	None Required
62 Rosella Road	54	58	4	None Required
64A Rosella Road	53	56	3	None Required
3/64A Rosella Road	56	60	4	None Required
66 Rosella Road	49	51	2	None Required
68 Rosella Road	42	43	4	None Required
1/70 Rosella Road	39	40	1	None Required
72 Rosella Road	41	44	3	None Required
4/72 Rosella Road	39	41	2	None Required
8 Orakau Road	47	48	1	None Required
10 Orakau Road	48	50	2	None Required
10A Orakau Road	60	64	4	None Required
12 Orakau Road	63	69	6	Mitigation required
Home Health Care	59	68	9	Mitigation required
Middlemore Hospital	58	59	1	None Required

5.3 Rail Vibration

5.3.1 Performance Standards

As discussed in Section 3.0, the rail designation contains no vibration controls.

For new rail activities near Middlemore Station that extend outside the existing rail designation, the relevant vibration controls in AUP Rule E25.6 apply. The objectives and policies (Section 3.2) require the vibration effects to be reasonable, but there are no vibration limits for rail vibration.

The determination of what is reasonable vibration from rail movements is addressed in the following sub sections.

5.3.2 KiwiRail Reverse Sensitivity Guidelines

KiwiRail has developed vibration criteria to avoid reverse sensitivity issues. The Guidelines do not have statutory weight unless adopted by a District Plan. They have not been included in the AUP.

KiwiRail Guidelines recommend new buildings or alterations to existing buildings within 60 metres of the boundary of a rail network should achieve Norwegian Standard NS 8176.E:2017 Class C (0.3mm/s $v_{w,95}$). However, the Guidelines do not apply to this Project because the new rail line is being built closer to existing houses.

The NS 8176 Standard is for measurement of vibration, not prediction. It also provides guidance to determine annoyance levels based on the measured vibration levels.

The U.S-based Federal Transit Administration (FTA) Impact Assessment is the best tool for predicting rail vibration. We understand that the train speeds passing Middlemore station would be up to 80 km/h (based on drawing number 601001-DR-NIMT-PUHOTU-TR-PL-100-01). This means that this method can be used to estimate vibration levels. However, it is dependent on several factors such as ground propagation conditions, suspension parameters, and track conditions and treatment.

No one rail assessment method is the right fit for this Project. We recommend applying the KiwiRail guideline value of 0.3 mm/s $v_{w,95}$ as a target value, and assessing risk using conservative calculations based on the existing $v_{w,95}$ data we measured on site (refer Section 5.3.3). As for the rail noise assessment, we have considered an assessment envelope to be 100m from the new railway line outside of the existing Designation (refer Section 5.2.6).

5.3.3 Existing Vibration Environment

In addition to the long-term noise measurements at Middlemore Station, we also carried out long-term vibration measurements at MP5, 9.5m from the closest rail (Section 5.2.8). We assessed the vibration levels from rail for the night-time period from in accordance with NS 8176. We used the measurement period from 2200 hrs on 17 June 2020 until 0700 hrs the following morning as a representative night-time period, which is the period of greatest effect for amenity (i.e. sleep disturbance). Based on these findings, we also derived a value for the daytime period based on the overall count of train movements.

At the Middlemore measurement position (MP5) we find:

- Night-time vibration: 0.6 mm/s $v_{w,95}$ (in accordance with NS 8176)
- Daytime vibration: 0.3 – 0.4 mm/s $v_{w,95}$ (derived value from above results)

The measured levels are categorised in the Class D (upper limit of 0.6mm/s $v_{w,95}$) of NS 8176 . NS 8176 states that Class D provides “vibration conditions in which the majority of exposed people can be expected to be disturbed”.

5.3.4 Rail Vibration Assessment

We have predicted the vibration levels due to the proposed layout based on our measurement results and the FTA vibration prediction tool. We have concentrated night-time period as this is the period of greatest effect. In summary:

- NS 8176 Class C (0.3mm/s $v_{w,95}$) is predicted at 27m from the existing rail lines. This is the recommended design threshold for new buildings (refer Section 5.3.2).
- NS 8176 Class D (0.6mm/s $v_{w,95}$) is predicted at 10m from the existing rail lines.
- This means that receivers within 10m to 27m of the existing rail lines are Class D

Assuming similar propagation for the new lines, receivers within 27m of the new rail line (Class D) are identified in Table 11.

Table 11: Receivers predicted to be exposed to high vibration

Receiver	Distance to new railway line (m)	Predicted vibration level (mm/s $v_{w,95}$)
52 Rosalia Road	7	0.9
54 Rosalia Road	21	0.4
60 Rosalia Road	18	0.4
10A Orakau Road	12	0.6
12 Orakau Road	5	1.1
Home Health Care	5	1.1

To ensure the vibration effects are reasonable, we consider the OPW design should consider vibration mitigation for the receivers in Table 11 to enable compliance with NS 8176.E:2017 Class C. The measures may include track isolation, an alteration to the design of the railway line layout, or creation of a discontinuity between the new railway line and the buildings so that vibration cannot as readily transfer from source to receiver.

6.0 RECOMMENDATIONS

6.1 Construction Noise and Vibration

We understand the following controls will be implemented as part of the Outline Plan for this NoR:

1. Construction noise will be measured and assessed in accordance with the provisions of New Zealand Standard NZS 6803:1999 “Acoustics - Construction Noise” and comply with the following Project Standards at any occupied building unless otherwise provided for in the Construction Noise and Vibration Management Plan (CNVMP) in part 3 below.

Receiving Environment	Day (0700 – 2000 hrs)	Night (2000 – 0700 hrs)
Occupied activities sensitive to noise	75 dB L_{Aeq} (30 min)	60 dB L_{Aeq} (30 min) 75 dB L_{AFmax}
All other occupied buildings	75 dB L_{Aeq} (30 min)	80 dB L_{Aeq} (30 min)

2. Construction vibration shall be measured and assessed in accordance with German Standard DIN 4150-3:1999 “Structural Vibration – Part 3: Effects of Vibration on Structures”, and comply with the following limits unless otherwise provided for in the CNVMP in part 3 below:

Line	Type of structure	Guideline values for velocity, v_i , in mm/s of vibration in horizontal plane of highest floor, at all frequencies
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10
2	Dwellings and buildings of similar design and/or occupancy	5

3. A Construction Noise and Vibration Management Plan (CNVMP) will be prepared. The objectives of the CNVMP are to:
 - a) Identify and adopt the Best Practicable Option (BPO) for the management of construction noise and vibration to avoid, mitigate or remedy adverse effects;
 - b) Define the procedures to be followed when construction activities cannot meet the noise and vibration standards in parts 1 and 2 above;
 - c) Inform the duration, frequency and timing of works to manage disruption; and
 - d) Require engagement with affected receivers and timely management of complaints.
4. The CNVMP will include, but not be limited to, the following:
 - a) The relevant measures from NZS 6803:1999 "Acoustics - Construction Noise", Annex E2 "Noise management plans";
 - b) The relevant measures from DIN 4150-3:1999 "Structural vibration - Part 3 Effects of vibration on structures", Appendix B "Measures for limiting the effects of vibration"; and
 - c) The Requiring Authority will offer a pre-construction condition survey for any building where the construction vibration levels are predicted to exceed the cosmetic building damage limits in part 2 above.

6.2 Operational Rail Noise and Vibration

We understand KiwiRail will undertake reasonable efforts to engage with affected parties. This will include existing occupied buildings within 100m of the new railway line outside of the existing designation at Middlemore Station. The eligibility for mitigation will be where noise exceeds the recommended noise assessment criteria in Section 5.2.6 or vibration exceeds NS 8176.E:2017 Class C.

The following properties are predicted to be eligible for mitigation:

Table 12: Receivers predicted to require mitigation for rail noise and vibration

Receiver	Mitigate Noise	Mitigate Vibration
52 Rosella Road	Yes	Yes
54 Rosella Road	Yes	Yes
60 Rosella Road	Yes	Yes
3/64A Rosella Road	Yes	No
10A Orakau Road	Yes	Yes
12 Orakau Road	Yes	Yes
Home Health Care	Yes	Yes

7.0 CONCLUSION

Marshall Day Acoustics has carried out a noise and vibration assessment for the construction and operation of the proposed Third Main railway line between Wiri Junction and Middlemore Station.

We have assessed construction noise and vibration effects. In summary:

- Construction noise and vibration within the rail designation are not controlled by designation conditions. Nevertheless, noise and vibration effects from the works must be reasonable. We have recommended criteria that trigger the need for mitigation and management measures to be implemented.
- Works outside of the Designation are controlled by the rules of the Auckland Unitary Plan.
- We have assumed that most of high noise and high vibration works will be carried out during daytime hours. There will be limited works required during the night-time as part of Block of Line works.
- Noise and vibration criteria are predicted to be exceeded at a number of buildings along the alignment to a varying degree. Therefore, mitigation measures will need to be implemented.
- We recommend that a Construction Noise and Vibration Management Plan is prepared prior to the works commencing.

We have assessed the rail noise and vibration effects from the proposed alteration to the railway designation for selected receivers within our recommended effects zone. In summary:

- We have recommended noise assessment criteria for rail noise and vibration enabled by the alteration to the rail designation; and
- We have predicted noise and vibration levels for the rail operations enabled by the proposed alteration and recommended where mitigation should be investigated for some receivers.
- The Project would have a noticeable adverse effect arising from the change in rail noise and vibration levels. However, with recommended mitigation measures such as noise barriers and/or building upgrades, the rail noise and vibration levels would be reasonable.

We have provided recommendations that should be implemented in the Outline Plan of Works for the Notice of Requirement.

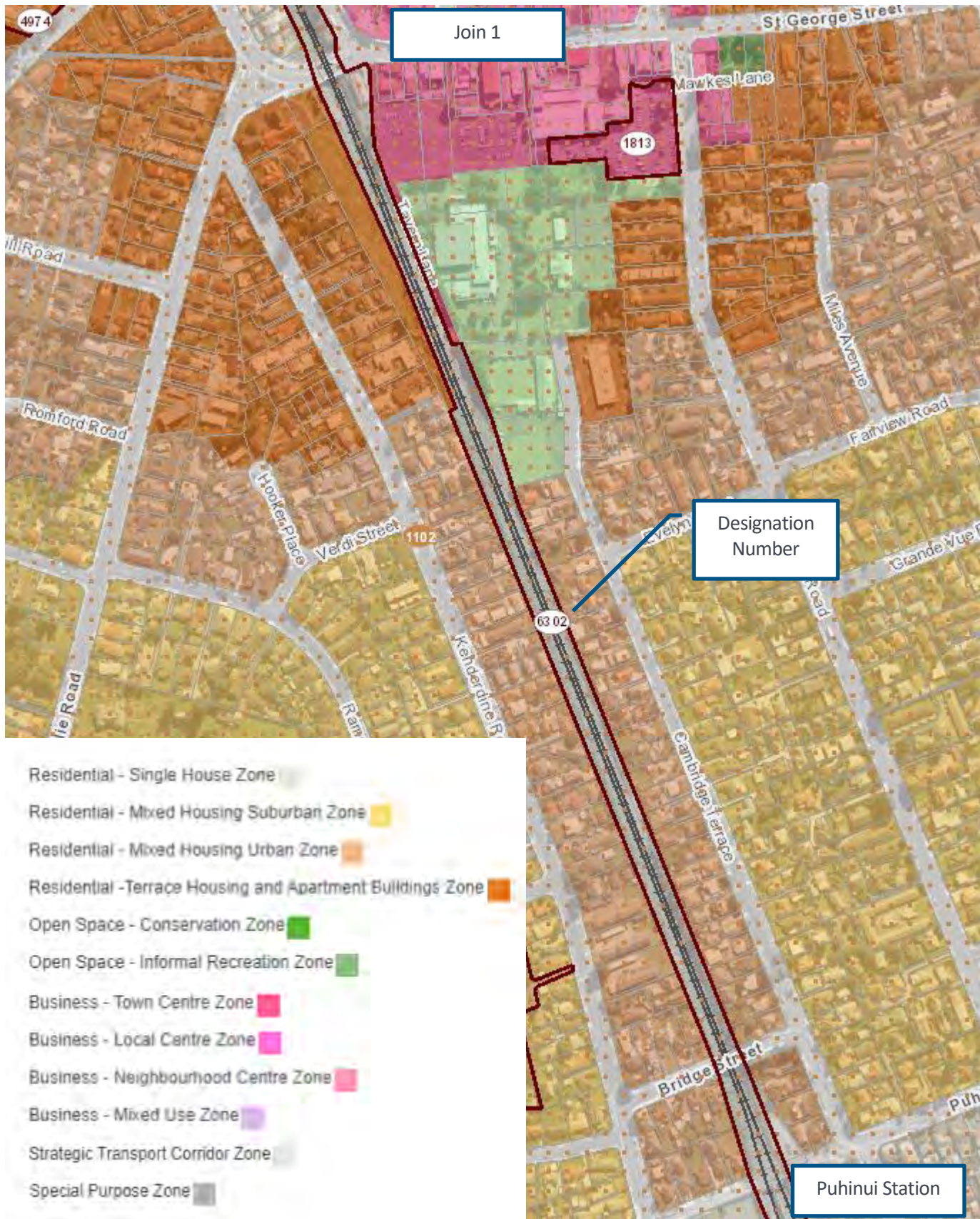
APPENDIX A GLOSSARY OF TERMINOLOGY

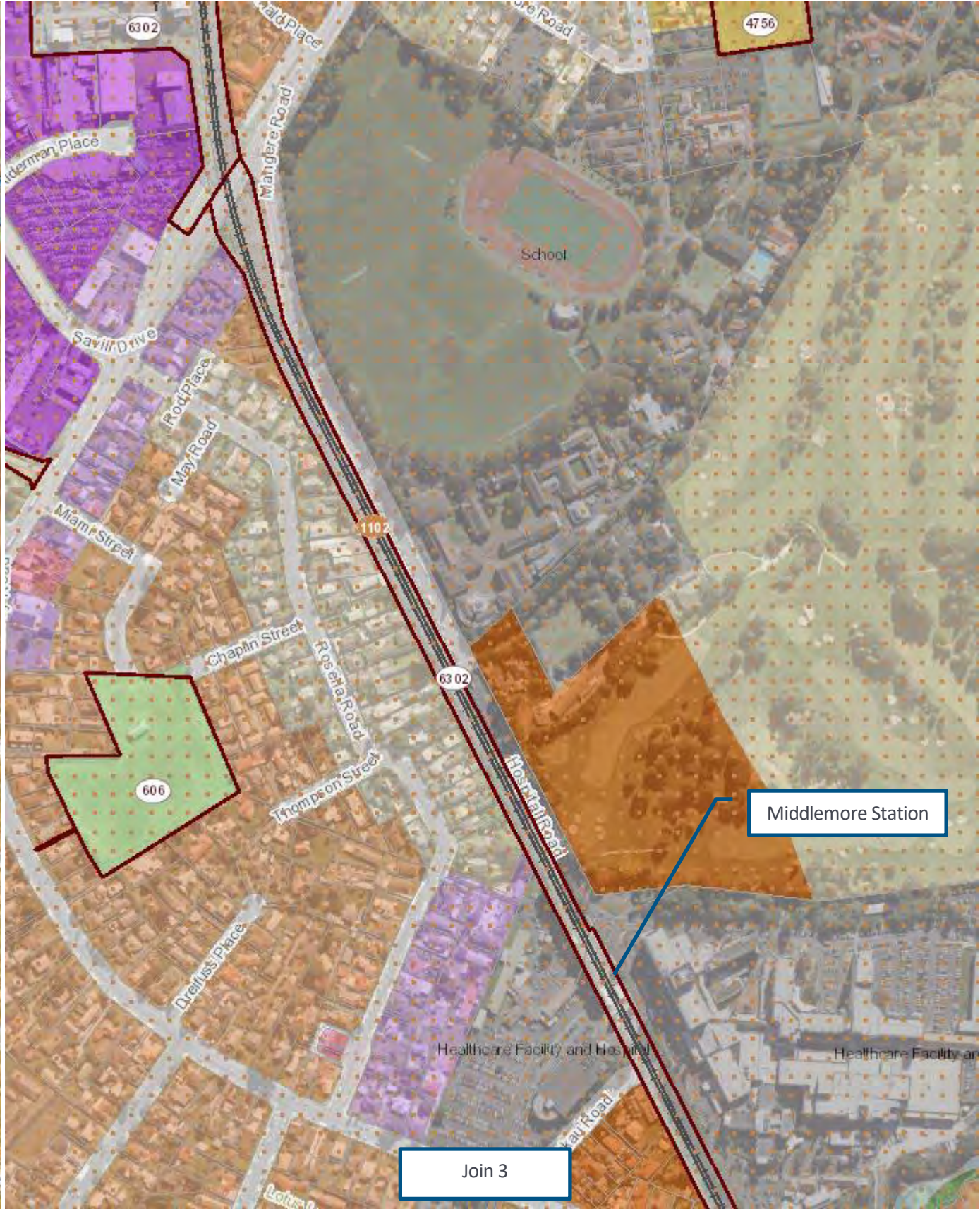
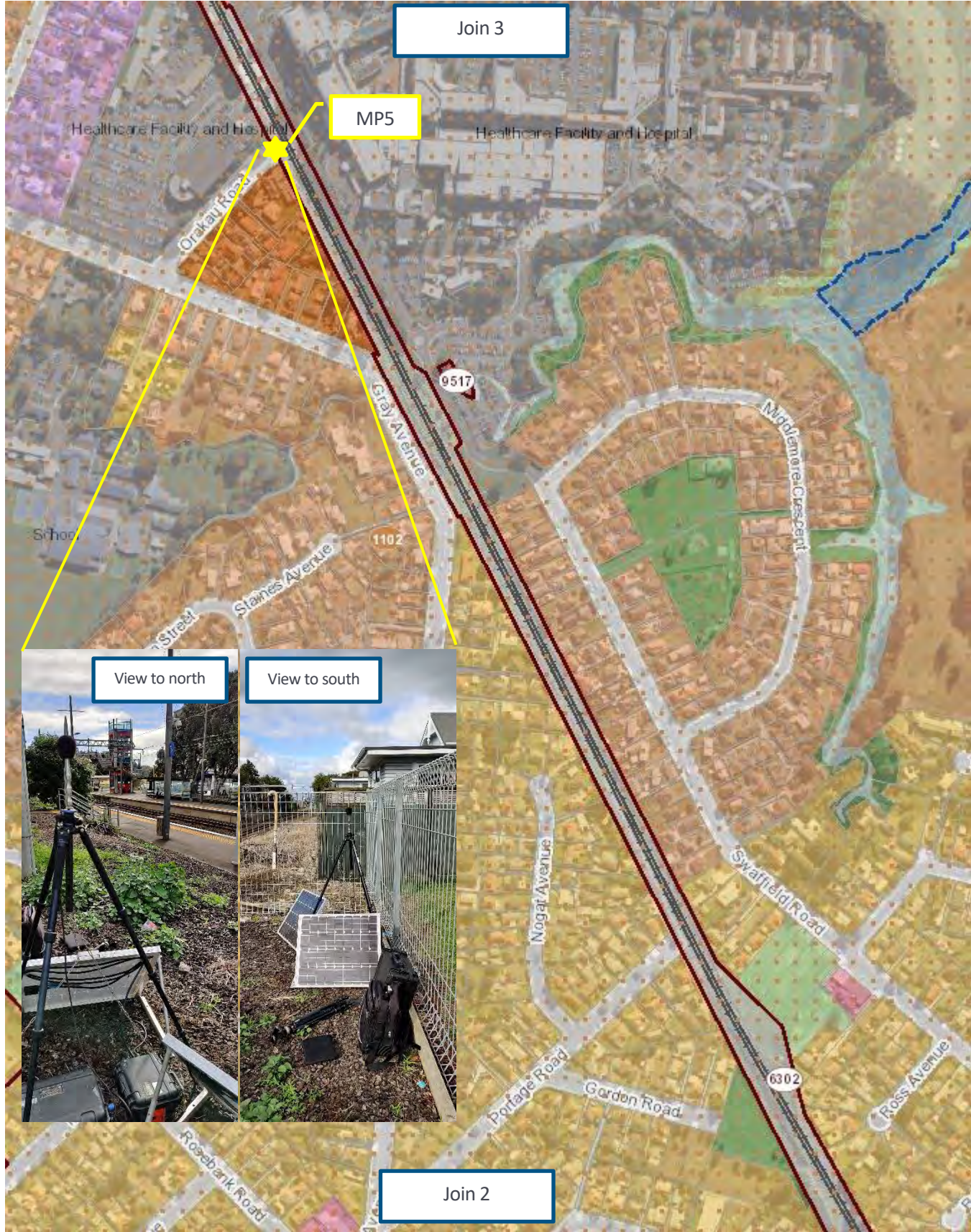
A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
AUP	The Auckland Unitary Plan – Operative in Part
Block of Line	Works that cannot be carried out while trains are operating and require a longer duration to complete. Blocks of Line are required to be planned at least 12 months in advance of the work being undertaken.
BS 5228-2:2009	British Standard BS 5228-2:2009 “ <i>Code of practice for noise and vibration control on construction and open sites Part 2: Vibration</i> ”
CNVMP	Construction Noise and Vibration Management Plan
dB	<u>Decibel</u> The unit of sound level. Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
DIN 4150-3:1999	German Standard DIN 4150-3:1999 “ <i>Structural Vibration - Effects of Vibration on Structures</i> ”
Hertz (Hz)	Hertz is the unit of frequency. One hertz is one cycle per second. One thousand hertz is a kilohertz (kHz).
Isolation Hours	Work cannot be undertaken while trains are operating but can be undertaken in a short time frame at night. For our assessment, we’ve assumed that these works will be before 2230 hrs
L_{Aeq} (t)	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level. The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
L_{Amax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
Noise	A sound that is unwanted by, or distracting to, the receiver.
L_w	<u>Sound Power Level</u> A logarithmic ratio of the acoustic power output of a source relative to 10^{-12} watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.
NS 8176:2017	Norwegian Standard NS 8176:2017 “ <i>Vibration and shock; Measurement of vibration in buildings from land-based transport, vibration classification and guidance to evaluation of effects on human beings</i> ”.
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 “ <i>Acoustics - Construction Noise</i> ”
PPV	<u>Peak Particle Velocity</u> For Peak Particle Velocity (PPV) is the measure of the vibration aptitude, zero to maximum. Used for building structural damage assessment.
Restricted Hours	Works that can be safely carried out while trains are operating but require rail protection and/or Electrical Safety Observers
Vibration	When an object vibrates, it moves rapidly up and down or from side to side. The magnitude of the sensation when feeling a vibrating object is related to the vibration velocity. Vibration can occur in any direction. When vibration velocities are described, it can be either the total vibration velocity, which includes all directions, or it can be separated into the vertical direction (up and down vibration), the horizontal transverse direction (side to side) and the horizontal longitudinal direction (front to back).

APPENDIX B PROPOSED THIRD LINE

The alignment is shown below, and the wider community and zoning is shown over leaf



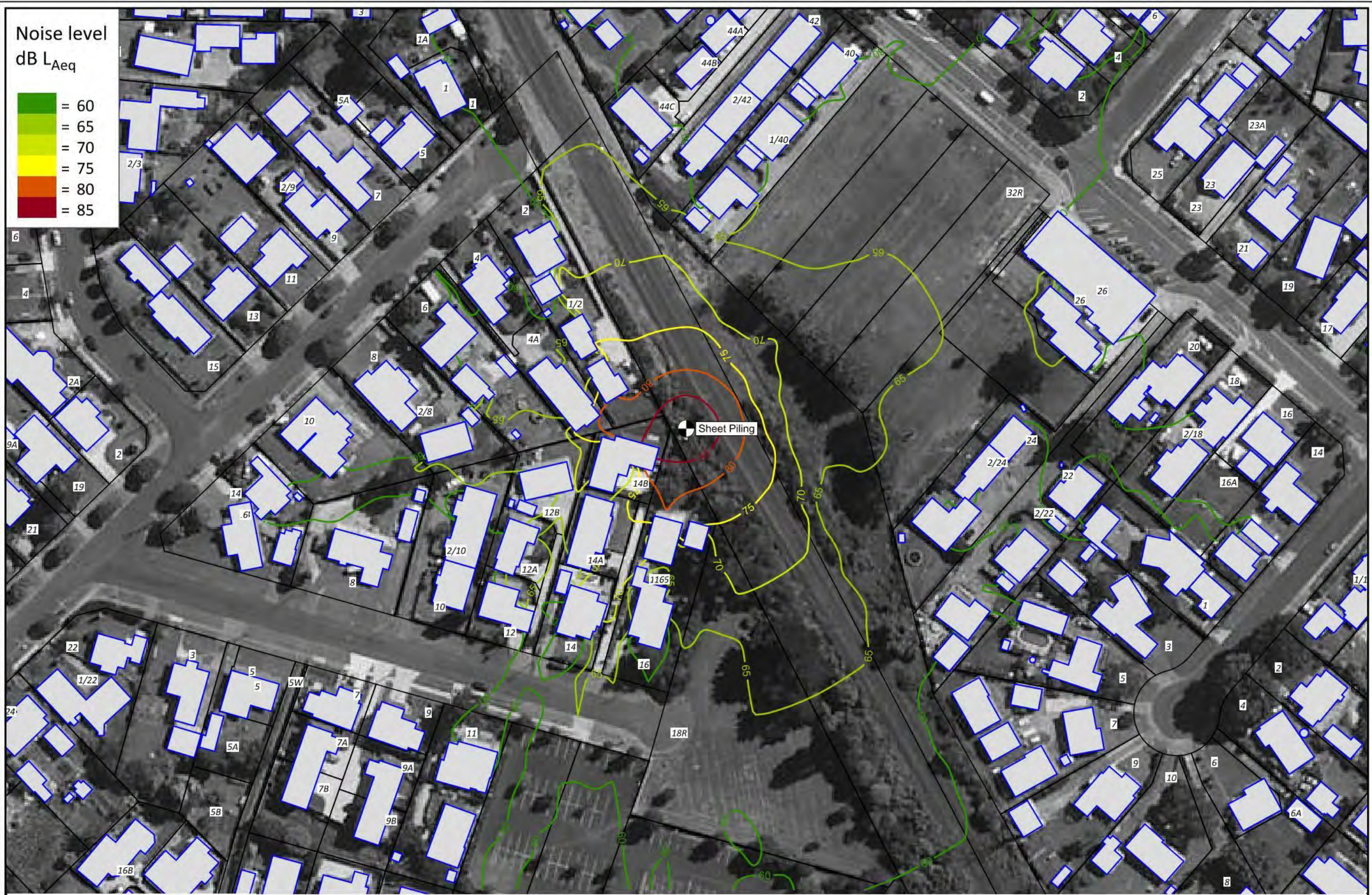




APPENDIX C INDICATIVE NOISE CONTOURS



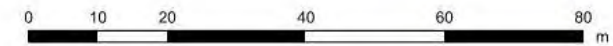




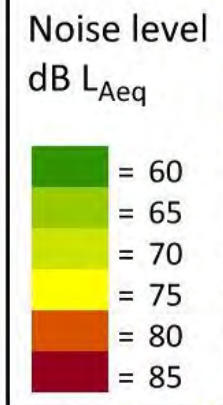
MARSHALL DAY
Acoustics

Predicted noise level - Sheet piling (unmitigated)

Date: 18/05/2020
Project No: 20200311
Client: Jacobs New Zealand Ltd
Run No.: 2



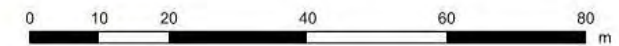
The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of +/- 1.5 dB.



MARSHALL DAY
Acoustics

Predicted noise level - Vibration Tamping (unmitigated)

Date: 18/05/2020
Project No: 20200311
Client: Jacobs New Zealand Ltd
Run No.: 3



The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of +/- 1.5 dB.

APPENDIX D COMPARISON OF RAIL NOISE CRITERIA

Appendix 4 Comparison of airborne noise levels for rail operations in Australia and overseas

Criteria are generally set for new or planned developments but may also be applied to existing operations (as in Switzerland) as well as to guide when action is required to reduce noise levels (see the alarm/priority criteria used in Denmark, the Netherlands, Norway, the United Kingdom, Switzerland and Canada). The criteria for existing operations are typically set at 5 dB above those for new or planned developments. Where alarm/priority criteria are set, these are 5–10 dB above the criteria for existing operations; where criteria have not been set for existing situations, the alarm/priority criteria are 5–10 dB above those set for new or planned developments.

Alarm/priority criteria shown in the table below are typically the legislated noise levels that require ameliorative action by government agencies or proponents, such as noise barriers or building treatments.

The levels used overseas are mostly legislated levels, whereas NSW noise trigger levels are non-mandatory targets that can be used to initiate an assessment of noise impacts and consideration of feasible and reasonable mitigation measures.

Table 7 Comparison of airborne rail noise criteria

Country	Existing rail line or redevelopment of existing line, dB	New rail line, dB	Alarm/priority, dB	Comments
Australia				
New South Wales	65 $L_{Aeq(day)}$ 60 $L_{Aeq(night)}$ 85 L_{Amax}	60 $L_{Aeq(day)}$ 55 $L_{Aeq(night)}$ 80 L_{Amax}	n/a	Triggers for assessment purposes. Light rail triggers are set at 60/50 dB $L_{Aeq(day/night)}$ and 80 dB L_{Amax} .
Victoria	65 $L_{Aeq(day)}$ 60 $L_{Aeq(night)}$ 85 L_{Amax}	60 $L_{Aeq(day)}$ 55 $L_{Aeq(night)}$ 80 L_{Amax}		The <i>Passenger Rail Infrastructure Noise Policy</i> (April 2013) aims to guide transport bodies and planning authorities in their consideration of rail noise and identifies thresholds above which action should be taken to minimise or mitigate noise.
South Australia	65 $L_{Aeq(day)}$ 60 $L_{Aeq(night)}$ 85 L_{Amax}	60 $L_{Aeq(day)}$ 55 $L_{Aeq(night)}$ 80 L_{Amax}	n/a	The <i>Guidelines for the assessment of noise from rail infrastructure</i> (April 2013) provide guidelines for the assessment of noise from rail operations. They give advice for development proposals and local plans, and underpin operating conditions for activities licensed under the <i>Environment Protection Act 1993</i> .
Queensland	Planning levels (to be progressively achieved) 65 $L_{Aeq(24h)}$ 87 L_{Amax}^* Interim levels (to be achieved now) 70 $L_{Aeq(24h)}$ 95 L_{Amax}^*	Planning Levels 65 $L_{Aeq(24h)}$ 87 L_{Amax}^*	n/a	The <i>Code of practice for railway noise management, 2007</i> (version 2) was developed by Queensland Rail to demonstrate compliance with general environmental duty under the <i>Environment Protection Act 1994</i> . The code has been approved for use by the State Minister for Environment under section 54B of the Act. New noise-sensitive developments proposed alongside rail corridors need to meet criteria set out in the Queensland Development Code (MP 4.4) which includes internal noise limits. *The L_{Amax} is assessed as a single event maximum level and is defined as the arithmetic average of the highest 15 maximum levels over a given 24-hour period.

Country	Existing rail line or redevelopment of existing line, dB	New rail line, dB	Alarm/priority, dB	Comments
Tasmania	<p>Planning levels</p> <p>65 $L_{Aeq(24h)}$ 87 L_{Amax}</p> <p>Interim levels</p> <p>70 $L_{Aeq(24h)}$ 95 L_{Amax}</p>	<p>65 $L_{Aeq(24h)}$ 87 L_{Amax}</p>	n/a	No formal criteria relating to rail. Freight services only operate in Tasmania and these use current Queensland criteria.
Western Australia	Major upgrades are dealt with on a case basis.	<p>55–60 $L_{Aeq(day)}$ 50–55 $L_{Aeq(night)}$</p>	n/a	<p>Under WA State Planning Policy 5.4 Sept. 2009, assessment is triggered at the lower level known as the noise target. The upper levels are noise limits above which noise-reduction measures need to be implemented.</p> <p>Assessments need to assume one train per hour at night which indirectly reduces maximum noise.</p> <p>New noise-sensitive development near existing rail lines needs to meet criteria for new rail lines.</p>
European countries				
Austria	n/a	<p>65–70 $L_{Aeq(day)}$ 55–60 $L_{Aeq(night)}$</p>	n/a	Includes 5 dB bonus ¹
Denmark	n/a	<p>63 $L_{Aeq(24h)}$ 85 L_{Amax}</p>	68 $L_{Aeq(24h)}$ – insulation trigger	Includes 5 dB bonus. At 68 dB(A) the owner must contribute 50 per cent to cost of insulation, 25 per cent at 73 dB(A) and 10 per cent at < 78 dB(A).
Finland	n/a	<p>58 $L_{Aeq(day)}$ 53 $L_{Aeq(night)}$</p>	n/a	
France	n/a	<p>63 (60) $L_{Aeq(day)}$ 58 (55) $L_{Aeq(night)}$</p>	n/a	Bracketed values are for TGV lines.
Germany	Planning values for new dwellings: 58–63 $L_{Aeq(day)}$ 48–53 $L_{Aeq(night)}$	<p>67 $L_{Aeq(day)}$ 57 $L_{Aeq(night)}$</p>	n/a	Includes 5 dB bonus.
The Netherlands	n/a	<p>63 $L_{Aeq(day)}$ 58 $L_{Aeq(morning)}$ 53 $L_{Aeq(night)}$</p>	<p>68 L_{Aeq} (at this level the state is responsible for correcting noise problem) 73 L_{Aeq} absolute maximum level allowed and only provided an indoor level of 40 L_{Aeq} can be met.</p>	Includes 5 dB bonus.

¹ Criteria for rail are generally 5 dB higher than those for road as rail is considered less annoying.

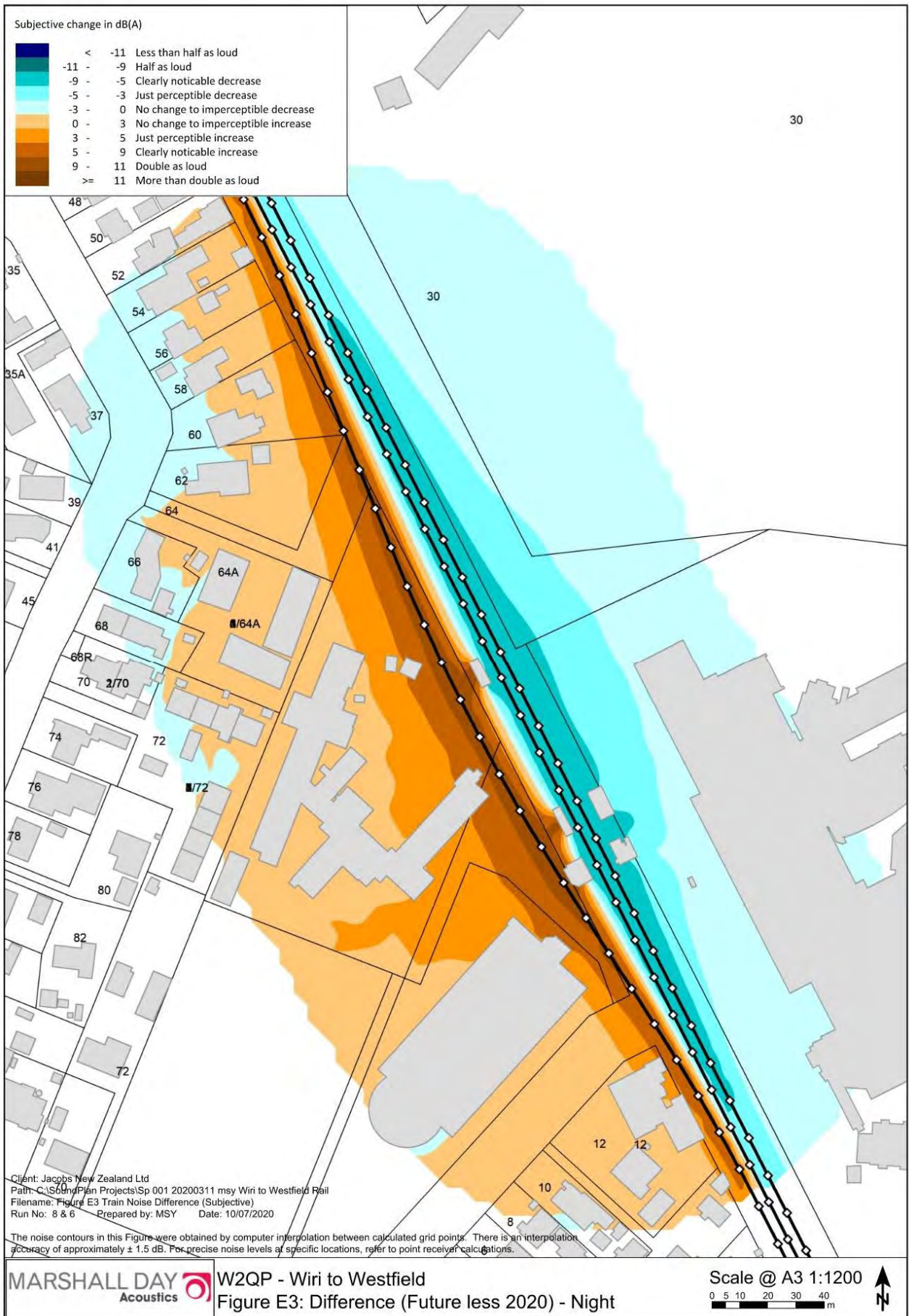
Country	Existing rail line or redevelopment of existing line, dB	New rail line, dB	Alarm/priority, dB	Comments
Norway	n/a	55–60 $L_{Aeq(24h)}$ 80 L_{Amax} 45–55 L_{Amax} (indoors)	Pay out at $L_{Aeq(24h)} > 65$ or $L_{Amax} > 90$ Otherwise if resident does not agree, then insulate to $L_{Aeq(24h)} < 35$ and $L_{Amax} < 55$	
Sweden	n/a	58 $L_{Aeq(24h)}$ 45 L_{Amax} (indoors)	n/a	
Switzerland	60–65 $L_{Aeq(day)}$ 50–55 $L_{Aeq(night)}$ ‘impact threshold’ Levels below this considered to have no impacts.	55–60 $L_{Aeq(day)}$ 45–50 $L_{Aeq(night)}$ ‘Planning value’ Levels for design of new developments	70 $L_{Aeq(day)}$ 65 $L_{Aeq(night)}$ ‘Alarm values’ levels at which assessment of remediation is required.	Levels presented are for residential classifications of which there are two – more sensitive zones are 5 dB lower than the less sensitive zones. For commercial and industrial add 5 and 10 dB, respectively. Railway bonus 5 to 15 dB depending on number of trains: the higher the number the lower the bonus. The levels quoted allow a 5 dB bonus.
United Kingdom	n/a	n/a	68 $L_{Aeq(day)}$ 63 $L_{Aeq(night)}$	Criteria used to determine insulation requirements.
North America				
Canada	n/a	35 $L_{Aeq(night)}$ (bedroom) 40 $L_{Aeq(day)}$ (living areas) 55 $L_{Aeq(day)}$ (outdoor)	n/a	
United States	n/a	52–65 $L_{Aeq}^{(1)}$ (serenity) 52–65 L_{Adn} (residences) 57–70 $L_{Aeq}^{(1)}$ (schools etc.) (5 dB onset adjustment for high-speed maglev [magnetic levitation] operations)	n/a	Depends on existing noise levels. Criteria stated vary, as corresponding existing noise levels vary from 43–63 dB(A). Criteria represent onset of impact and also are cumulative levels (i.e. existing plus new).
Asia				
Hong Kong	n/a	60 $L_{Aeq(30 min)}$ (day and evening) 50 $L_{Aeq(30 min)}$ (night) 85 L_{Amax} (night)	n/a	Values given for residential areas not affected by other noise sources. For increasingly affected areas add 5 and 10 dB to the L_{Aeq} criteria.
Japan	n/a	70 L_{Apeak} (residential) 75 L_{Apeak} (commercial, industrial with residences)	n/a	For the Shinkansen Superexpress railway. Measured as the energy mean of the highest 10 out of 20 successive train measurements between 8 am and midnight (with meter set to slow response).

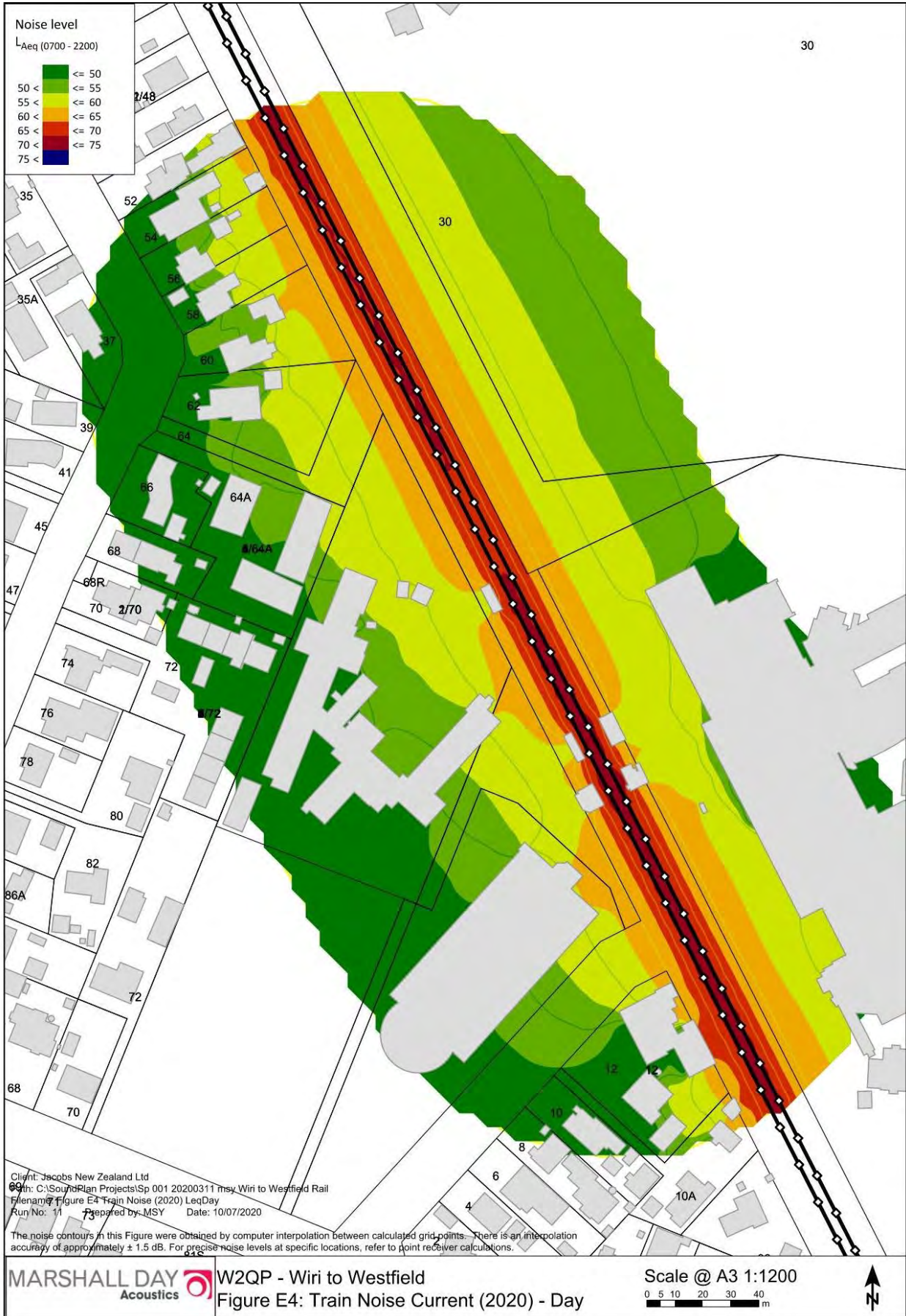
¹ Criteria for rail are generally 5 dB higher than those for road as rail is considered less annoying.

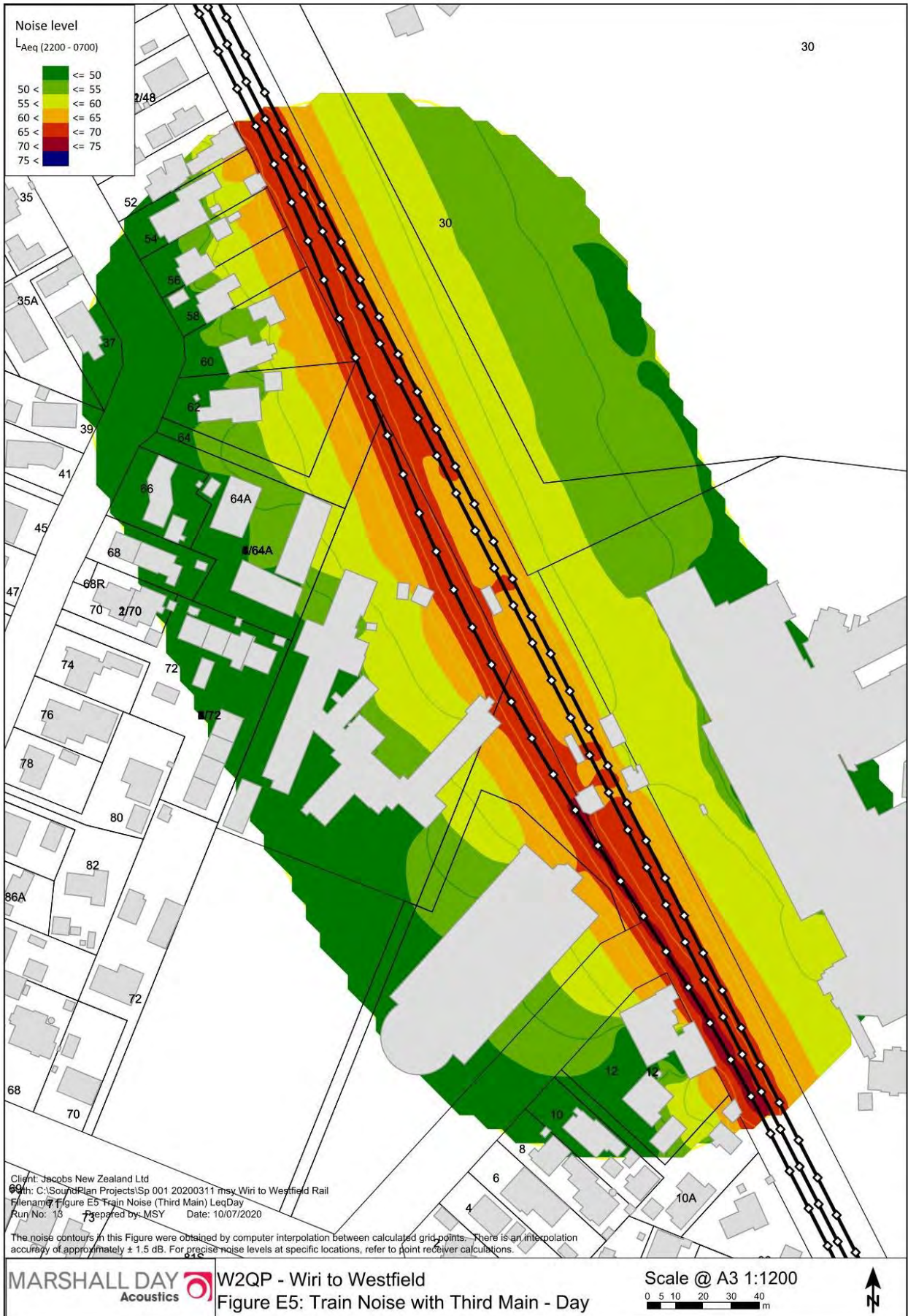
APPENDIX E PREDICTED NOISE LEVELS

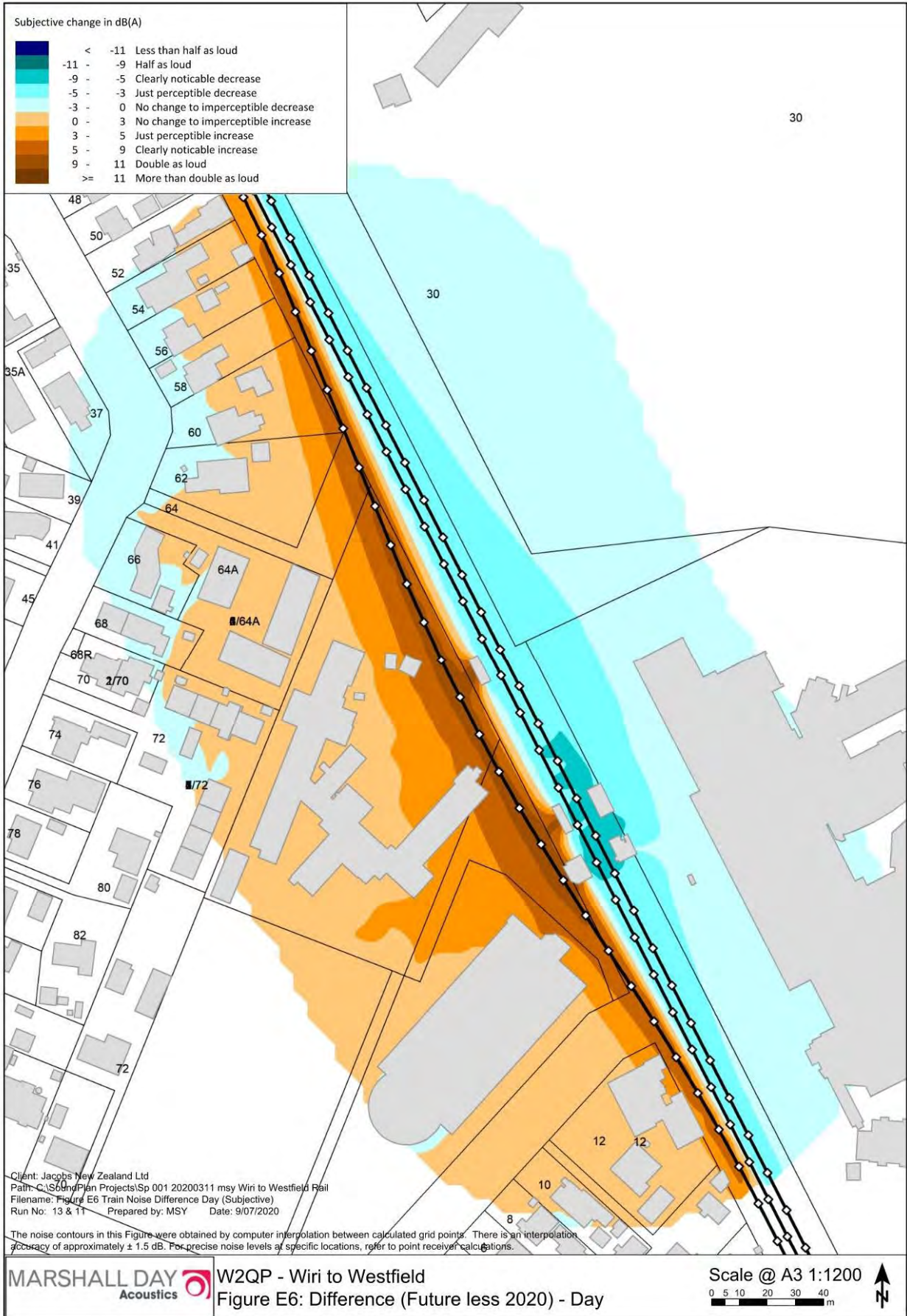












The Tree Consultancy Company
PO Box 35-284
Browns Bay
Auckland, 0753

Andrew@TreeConsultancy.co.nz
+64 27 287 1182
0508 TREE CO (873 326)
TreeConsultancy.co.nz



Arboricultural Report

KiwiRail Wiri to Quay Park

on
Notice of Requirement

Prepared for Tim Hegarty
Jacobs

Prepared by Andrew Benson (Ph.D., BSc, FdSc)
Urban tree ecophysiologicalist


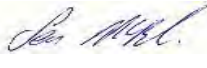


Date 9 July 2020

Job ref # 1635

Reviewed by Sean McBride

Contents

1	Introduction	1
2	List of appendices.....	1
3	Scope and limitations of the tree survey.....	2
4	Notable tree assessment.....	2
5	Existing environment.....	3
6	NoR land take areas.....	4
7	Arboricultural description	4
8	Effects.....	5
9	Affected parties	7
10	Mitigation	7
11	Conclusions and recommendations	9
12	Bibliography	10
	Appendix A – Tree inventory.....	12
	Appendix B – Drawings 1642_001 and 002, rev B	19
	Appendix C – Site photographs	22
	Appendix D – Notable tree scoring schedule.....	24

Document status			
Date	Author	Reviewer	Status
12 June 2020	A. Benson 	S. McBride 	First draft for client review. NOT FOR NOTIFICATION OR CONSULTATION PURPOSES
22 June 2020	A. Benson 		Second draft for client review. NOT FOR NOTIFICATION OR CONSULTATION PURPOSES
9 July 2020	A. Benson 		Final version for notification

1 Introduction

1.1 The Tree Consultancy Company has been commissioned to provide arboricultural input to a proposal to construct a third rail line between Middlemore Station and Wiri Junction. The purpose of this document is to accompany a package of information for a notice of requirement (NoR). The scope of services we have been asked to provide is as follows:

- A summary of the existing environment
- Consideration of both the construction and operational effects of the works
- Identification of any affected parties and
- Identification of mitigation required

1.2 In addition, we have undertaken a notable tree assessment for several trees outside of the current designation and in proximity to the proposed works.

2 List of appendices

- Appendix A – Tree inventory
- Appendix B – Drawing 1642_001 and 002 rev B
- Appendix C – Site photographs
- Appendix D – Notable tree scoring schedule

3 Statutory context

3.1 Outside of the already designated areas of the rail corridor, the following rules of the Auckland Unitary Plan affect the protection of trees on public land.

E16 – Trees in Open Space zones

E16.4.1

- (A5) Tree trimming or alteration*
- (A6) Tree trimming or alteration that does not comply with Standard E16.6.1*
- (A7) Works within the protected root zone*
- (A8) Works within the protected root zone that do not comply with Standard E16.6.2*
- (A9) Tree removal of any tree less than 4 m in height and less than 400 mm in girth*
- (A10) Tree removal of any tree greater than 4 m in height or greater than 400 mm in girth*

E17 – Trees in roads

E17.4.1

- (A5) Tree trimming or alteration*
- (A6) Tree trimming or alteration that does not comply with Standard E17.6.1*
- (A7) Works within the protected root zone*
- (A8) Works within the protected root zone that do not comply with Standard E17.6.3*
- (A9) Tree removal of any tree less than 4 m in height and less than 400 mm in girth*
- (A10) Tree removal of any tree greater than 4 m in height or greater than 400 mm in girth*
- (A11) Planting over network utilities with trees with a mature height of more than 4 m*
- (A12) Tree trimming, alteration or removal not otherwise provided for*

4 Scope and limitations of the tree survey

- 4.1 The scope of our assessment is from Wiri Station Road to Middlemore Station. All observations and information were gathered either from public land (e.g. roads and parks) or from video footage taken from the train during normal passenger travel.
- 4.2 Trees were surveyed (including GPS points ± 1 m) in June 2020 by Mr Matthew Clifford of the Tree Consultancy Company in line with the limitations outlined in 4.1. The notable tree assessment was undertaken by Dr Andrew Benson of The Tree Consultancy Company in June 2020. The survey and assessment of effects have focussed on trees associated with the NoR land take areas which were readily accessible (as outlined in 4.1) and also worthy of individual record (e.g. shrubs, pest plants and juvenile vegetation in and around the rail corridor are not discussed). A general description of the existing environment is provided based on the observations we were able to make from public land. The NoR land take requirements were provided to us on the following Jacobs / KiwiRail drawings:
- IZ233800-SK103 (A) – 28/4/20
 - IZA233800-SK104 to SK140 (A) – 28/4/20
- 4.3 In addition to the access limitations, construction activity and private ownership of various land parcels precluded access and visibility to some areas of the corridor. For example, Puhinui Station and a pocket of public reserve south of Onslow Avenue bounded by private properties, respectively.
- 4.4 Where trees were accessible, trunk diameter measurements were taken for the purposes of establishing structural root zone radii (Coder, 1996) and tree protection zone radii (Benson et al., 2019a). Trunk diameter is a more reliable predictor of root system spread than crown size or tree height (Day et al., 2010).

5 Notable tree assessment

- 5.1 Auckland Council's latest assessment method for scoring trees for notable status has four criteria for awarding points: *age and health*, *character or form*, *size* and *visual contribution*. Trees must achieve at least 20 points in these four criteria (combined) to be considered for notable status. There is also a special criterion, for which a tree must meet at least one of the categories to make it worthy of notable status. For our assessment, all trees scored in the '*Intrinsic*' category, because all trees have intrinsic values. A copy of the scoring system is included as an appendix to this assessment.
- 5.2 The method is entirely subjective and does not clearly set out guidance on how to objectively award points in each of the criteria, and several of the subjective terms are not sufficiently qualified so as to eliminate or limit ambiguity. In order to address this, we have used a single assessor to score the trees (to remove inter-appraiser variability), used our expert knowledge of trees, conservatively estimated tree age (an older tree will score higher than a younger tree) and systematically set out a criteria from which to establish average dimensions of other trees of the same species nearby (e.g. whether a tree is larger than the average tree expected in a particular location – the '*size*' criterion).
- 5.3 In order to establish the average dimensions for trees 'in a particular location', we surveyed an area of 3 square kilometres (two areas of 1.5 square kilometres, one for each location where we have located trees worthy of notable status) from public land and recorded the dimensions of trees of the same species as those which we believed were suitable for inclusion as notable trees. The dimensions recorded were trunk diameter at 1.4 m (DBH), tree height (recorded using a digital laser hypsometer) and canopy spread.

- 5.4 Only trees visible from public land were recorded and no private property was entered. It is possible to record height and canopy spread dimensions from trees in private property without entering it, but access to the tree is required to measure the trunk. Once the average dimensions ‘in a particular location’ of trees for each species are established, it is then possible to compare the size of the proposed notable trees so as to award points correctly, and defensibly.

6 Existing environment

- 6.1 The existing environment is a rail corridor, with multiple lines in a north to south direction and is designated as strategic transport corridor. Between Wiri Station Road and Puhinui Station, the surrounding land use is industrial, and the rail corridor and adjacent sites are largely devoid of trees worthy of mention. Puhinui Station was undergoing construction work during our site assessment window, and so we were unable to view the trees here in detail. A group of four or five Himalayan cedars abuts the northbound line which look to be growing on land occupied by an early childhood education centre. A parcel of land zoned as road abuts the southbound line, and site aerial photographs show trees present, although we are unable to confirm what these are due to access limitations.
- 6.2 North of Puhinui Station, the surrounding sites become residential, and whilst the rail corridor remains devoid of trees worthy of comment, mature trees in various private properties on both sides of the corridor overhang and abut the north and southbound lines. We provide no comment on these trees including species identification owing to the access constraints. Should homeowners have specific concerns over these trees during a notification process, then access to the trees would need to be provided to an assessing arboricultural expert to address any comments raised.
- 6.3 North of Puhinui Station, the land use remains largely residential, with the addition of a pocket of recreation land abutting the southbound line (Alan Brewster Leisure Centre and the Papatoetoe RSA Bowling Club). Various trees (mainly titoki, 4 – 6 m high) abut the southbound line, presumably providing some screening to the bowling club.
- 6.4 Papatoetoe Station abuts a pocket of council-owned reserve land (open space – informal recreation) in which trees of various species, origins (native and exotic) and age classes are present. On inspection, it appears from the tree cover and vegetative characteristics that the reserve continues north, beyond a narrow footbridge which services the station, whereas, the planning maps indicate that the pocket of land to the north is in fact within the current transport corridor designation. The designated land pocket is home to a number of good-quality indigenous and exotic trees in a mature age class. These trees are contributing positively to local ecosystem service¹ provision.
- 6.5 Between Papatoetoe Station and Middlemore Hospital, the surrounding land use is once again residential and the same sporadic private trees are observed abutting the rail corridor boundary, and the rail corridor itself remains largely devoid of vegetation. At the Middlemore Station, various trees are present, including a row of 49 mature Japanese red cedar (\approx 16 m high).

¹ Ecosystem services are defined as the direct and indirect contributions of ecosystems to human well-being.

7 NoR land take areas

7.1 Between Wiri and Middlemore, ten land parcels (or portions thereof) will be subject to the NoR for the purposes of permanent occupation. Eleven land parcels (or portions thereof) will be subject to the NoR for the purposes of temporary occupation. Given our access restrictions, we were only able to access and appraise the trees in two of these locations. Those being; Papatoetoe Station (temporary occupation, currently open space land) and Middlemore Station (permanent occupation, currently zoned healthcare facility and business use). The parcels (or portions thereof) of land subject to the NoR are shown on the aforementioned Jacobs drawings as well as our site drawings appended to this report.

8 Arboricultural description

- 8.1 At the two accessible locations, we undertook a tree survey to identify tree species, locations, and dimensions, and to undertake the notable tree assessments. An inventory of these trees is appended to this assessment with the corresponding tree numbers depicted on the site aerials (1642_001 and 002, rev B).
- 8.2 At Middlemore, trees 1 (Monterey cypress), 2 (49 x Japanese red cedar) and 3 (Himalayan cedar) were recorded as being worthy of notable status. Within the 1.5 km² area surrounding these trees, the dimensions were recorded for n = 0 Monterey cypress, n = 4 Japanese red cedars and n = 12 Himalayan cedars, to establish the average dimensions for these species in this location. Tree 1 will not be affected by the NoR land take, although looks to be growing within the rail corridor (based on the location of a fence). Tree group 2 is within an area of permanent occupation (a new station platform) and will therefore require removal unless an alternative can be found. It is unclear where these trees are growing precisely (either within the current designation or within hospital land). Appropriate remedial measures should be adopted to address the environmental impact and loss of local amenity which will occur as a result of removing these trees. Tree 3 is outside of the land take area at Middlemore, yet the alterations for the new platform will be within the tree's root zone area. Given the tree's current growing environment (road reserve), making inferences about the effects of the land take and later construction would be conjectural at best (see 9.8).
- 8.3 At Papatoetoe Station, 56 trees were recorded in the area of contiguous tree cover. Thirty-nine of these trees are located in the northern parcel of land which falls within the current designation. The precise location of the designation boundary is unclear from site observations, and our GPS survey device carries up to 1 m of error. One tree (tree 45; titoki) scored high enough to achieve notable tree status, and because we are unsure of its precise position relative to the designation boundary (i.e. it may or may not be within the current designation area), we have conservatively included it in our assessment.
- 8.4 In the open space area to the south, 17 trees were recorded which achieve protective status by virtue of their dimensions. Four of which (44, oriental plane; 46, totara; 49; Japanese red cedar and 54, London plane) scored highly enough to be considered for notable status. Within the 1.5 km² surrounding area, the dimensions were recorded for n = 13 titoki, n = 14 totara, n = 0 Japanese red cedar, n = 0 oriental planes and n = 14 London planes, to establish average dimensions for these species in this location. Only tree 54 will be affected by the (temporary) land take footprint, although the specifics of this remain unknown at this stage. Tree 53 (rimu) is within the footprint of the (temporary) land take and we suspect that it will require removal to accommodate the temporary occupation. The tree is juvenile and suppressed, and inappropriately positioned under tree 54 to ever achieve its optimum final dimensions. Remediating the removal of this tree can be achieved over a short temporal scale with a minimum of three new 45-L grade trees.

9 Effects

- 9.1 ‘*Effects*’ can be interpreted and analysed in one of two ways in this context. There are those effects which relate to the Resource Management Act (RMA), e.g. ‘*effects to protected trees*’, as assessed using predetermined statutory criteria. There are also measurable environmental effects, expressed in biological terms and analysed using a science-based approach, e.g. the loss of habitat when non-protected trees are removed. We have considered both in our assessment below, to provide a clear picture of the environmental impacts of the project, and to assist the planning team in their RMA assessments.
- 9.2 The NoR may affect trees in one of two ways. Direct effects, i.e. those which encroach directly into a tree’s growing location thereby necessitating its removal, and indirect affects, i.e. those which result in incursions into a tree’s root zone area which may result in a). tree removal owing to collateral damage to root systems or b). have the potential to negatively affect tree health and stability through damage to root systems and the surrounding soil environment. The latter (b) can often be managed through tree management protocols and preservation methods to limit damage to within tolerable limits. Most trees will tolerate some degree of root loss if this is undertaken carefully (Hamilton, 1988; Watson, 1998; Watson et al., 2014).

Effects in the context of the RMA (protected trees only)

- 9.3 At Middlemore Station, the land-take area occupies 34m² of tree 3’s (Himalayan cedar) AUP-defined protected root zone² area (8%). Without invasive methods, e.g. exploratory excavation, it is impossible to confidently state the diameters of roots which would likely be encountered in this footprint, and so conservatively, this encroachment must be considered under E16.4.1 (A8). Operationally, the tree is likely to require live crown removal to achieve required clearances from the rail corridor and associated infrastructure. Conservatively, E16.4.1 (A6) needs to be considered.
- 9.4 At Papatoetoe Station, the land-take area directly conflicts with the growing location of tree 53 (rimu) which will therefore need to be removed. The tree is of sufficient size to achieve protective status in this location, and its removal must be considered under E17.4.1 (A10). Appropriate remedial planting will be required to address the removal of this tree in line with RMA and Unitary Plan requirements.
- 9.5 The NoR temporary occupation footprint also encroaches into tree 54’s (London plane) AUP-defined protected root zone area. The level of encroachment is 35 m² (11%). Given that the incursion is on the periphery of the tree’s structural root zone, the likelihood of encountering roots meeting the descriptions outlined in E16.6.2 is considered very high, and therefore this activity must be considered under E16.4.1 (A8). Similar to tree 3, live crown removal is conceivable to achieve harmonious operation of the rail corridor, which would need to consider E17.4.1 (A6).
- 9.6 With reference to 9.3 and 9.5, the activities trigger Unitary Plan infringements. However, understanding the actual effects needs to be considered objectively in biological terms and in consideration of tree surroundings. We have discussed this as follows, including non-protected trees for completeness.

² Established using branch spread

Effects in biological terms (all trees)

- 9.7 In terms of direct effects of the NoR, tree group 2 (49 x Japanese red cedar) and tree 53 (rimu) will need to be removed. In consideration of the ecosystem services provided by trees, and specifically carbon sequestration, we consider that the loss of these trees requires appropriate remedial planting, to achieve sustainability goals and align with KiwiRail's 'Carbon Zero Programme' and Auckland Council's 'Low Carbon Strategic Action Plan'. We have discussed this later in section 11.
- 9.8 In terms of indirect effects, i.e. root zone incursions, for open-grown trees (i.e. where root growth is unimpeded by structures etc.), there are reliable tools available to make reasonably accurate predictions about the extent of lateral root spread (Day et al., 2010; Benson et al., 2019a), and hence the level of incursion, from which an understanding of the effects can be established (Benson et al., 2019c). These tools use various multiplications or manipulations of trunk diameter measurements to establish these values. However, it is almost impossible to accurately predict root system spread on modified urban sites, since the presence of infrastructure (e.g. kerbs, roads, buildings and retaining walls) can affect root system architecture and morphology (Čermák et al., 2000; Jim, 2003), and asphalt surfaces can affect sub-terranean environmental conditions (Nicoll and Armstrong, 1998; Grabosky et al., 2001; D'Amato et al., 2002) and roots may form in unexpected locations (e.g. deeper or shallower than an open-grown field environment). Additionally, surface permeability is already highly modified in contrast to an unmodified site, and so the effects of site changes and construction on tree health (hydrological strain) are difficult to establish. For these reasons, it is very difficult to make inferences about actual and potential effects when trees are modified in this way. The only way to fully understand this would be with a thorough understanding of root system architecture (e.g. after exposing roots by way of an excavation) and ascertaining the extent of root system loss arising from construction. This requires expert knowledge and a great deal of experience.
- 9.9 At Middlemore, the new platform will be within, or in close proximity to the root zone of tree 3 (Himalayan cedar). We do not believe that surface permeability and the tree's access to available soil water will be greatly affected as much of the root zone is covered in asphalt, but the detailed design of the platform will need to consider root structures. The use of piles is an effective way of constructing elevated structures in tree root zones, where the piles are positioned strategically around roots.
- 9.10 At Papatoetoe Station, trees 51, 52, 54 – 57 (inclusive) are in the region of the open space reserve where temporary occupation is required. These are open-grown trees, with largely unimpeded root zones (aside from the rail corridor), and so inferences about the effects of incursions can be made. The occupation footprint is firmly within the root zone area (including the structural root zone area) of tree 54 (London plane). Damage to structural roots can have dire consequences to trees, both in terms of tree stability (Smiley, 2008) and tree health (Benson et al., 2019a; Benson et al., 2019c).
- 9.11 The scope and magnitude of the temporary occupation footprint is unknown, but by definition because it is a transient activity, tree 54 (and its neighbours) should be actively preserved, as these are long-lived organisms that will provide many benefits into the future, long beyond the duration of the corridor upgrade. Negative effects which could arise as a result of root losses, or damage to surrounding soils include water stress symptoms and compromised physiological function (Benson et al., 2019a; Benson et al., 2019b, c), which can predispose trees to future, co-occurring stresses (e.g. drought) (Fini et al., 2020).
- 9.12 We have discussed tree preservation methods in section 11. In general, these need to include trunk protection (to prevent impact injuries) and ground protection (to prevent root damage) as well as soil improvement (such as wood-chip mulch) to help offset the effects of soil disturbance and changes to hydrology.

- 9.13 It is unclear whether the land take area also includes the space above the land, and if so, to what height. That is, we are unclear on what the activities will be in the temporary occupation area and whether this will affect the above-ground tree parts, e.g. a crown pruning requirement. Tree 54 overhangs the rail corridor at present and its crown is firmly within the temporary occupation footprint. Some degree of crown pruning is acceptable, but not to the extent that the tree becomes disfigured, or structurally compromised as a result.
- 9.14 In terms of the operational needs of the rail corridor and the associated ongoing effects to trees, providing the detailed design and engineering for the platform at Middlemore are prepared in acknowledgement of the tree's root system, the ongoing effects are expected to be negligible, and limited only to regular maintenance of the crown, i.e. pruning to achieve required clearances. At Papatoetoe Station, trains running on the new line will be pushed closer to the trees than at present. The ongoing effects of which are likely to include a requirement for crown pruning, to achieve required clearances. Overhead pylons would need to be strategically positioned to avoid conflict with the tree(s). For the purposes of the NoR, this is not a material consideration, but will need to be addressed later when the design is progressed and methods to work around and preserve trees are considered.
- 9.15 Because we were unable to access the rail corridor or private properties, any comment on specific effects to vegetation in the affected properties would be conjectural, which we prefer to avoid. Specific comment on these matters can be addressed during the notification process if submissions are made. Access to the properties would be required in order to provide this detail.

10 Affected parties

- 10.1 We make no specific comment about privately owned trees, e.g. those in private properties. Consultation with council's urban forest specialist (as an affected party) would be necessary when considering the trees at Papatoetoe Station in the council-owned public reserve. The precise ownership of tree group 2 (Japanese red cedar) is unclear, as it appears to border the rail corridor and the adjacent hospital-owned facility. Consultation with the hospital is advised, unless KiwiRail's ownership of these trees can be confirmed.

11 Mitigation

- 11.1 By definition, mitigation acknowledges a lasting negative effect, and so we prefer to adopt an approach which remedies these impacts, particularly as this relates to tree removals. When trees are removed, the remedial planting needs to account for lost future benefits, as all benefits up to the date of removal have already been received (Nowak and Aevermann, 2019), e.g. sequestered carbon. We have used i-Tree Eco's (Nowak and Crane, 2000; The i-Tree Development Team, 2020) forecasting tool to estimate the lost future benefits arising from the proposed tree removals. The i-Tree software quantifies ecosystem services provided by trees based on input dimensions, known species characteristics and growth rates. It has been developed through peer-reviewed science over the last 20 or so years with international collaborations, and recently, New Zealand. Using the same tool, and with known dimensions of 45-L grade nursery trees, the benefits of these nursery trees are forecast in the same way. The remedial planting therefore needs to match or exceed the value of total stored carbon which would have been achieved by the existing asset at the end of the forecast period.
- 11.2 We used the dimensions of the trees being removed and forecast the carbon sequestration values for 30 years. A value of 30 years was chosen because a). this was a realistic life span for each of the trees in their current location and b). a goal has been set for carbon neutrality by the Climate Change Response (Zero Carbon) Amendment Act (2019) by 2050. The estimated resulting carbon footprint arising from tree removals is shown in the table on the following page.

Tree #	Species	Carbon footprint (T)	Value of stored carbon (\$)³	Number of new trees required to reach carbon neutrality
2*	49 <i>Cryptomeria japonica</i>	8.4	\$2,090	9
53**	<i>Dacrydium cupressinum</i>	1.8	\$441.74	3
Total		10.2	\$2,531.74	12

* - currently non-protected trees

** - currently protected trees

- 11.3 It can be seen that the carbon footprint of removing protected trees is 1.8 metric tonnes, and of removing non-protected trees is 8.4 metric tonnes. This is equivalent to manufacturing 10.2 tonnes of cement (Kenai et al., 2014), or between 2.5 and 5 tonnes of concrete, depending on loading capacity. This, of course, does not take into account the carbon footprint of the construction activities associated with the rail corridor improvements itself.
- 11.4 The remedial planting therefore needs to achieve this same value of stored carbon by 2050 if carbon neutrality is to be achieved, and the actual effects of tree removal are to be addressed in a sustainable fashion. Allowing for 3% mortality, this equates to 12, 45-L trees planted in a such way that they can achieve optimum final dimensions. Planting locations and the long-term future development of the trees is critical to the success of the carbon offsetting. Trees which are incapable of achieving large dimensions in the given time period will not achieve the required value of stored carbon and thus not achieve carbon neutrality. Given the spatial constraints of the rail corridor, planting this number of trees to meet this specification may be unachievable. Ideally a nearby public reserve would be identified and through negotiations with Auckland Council’s Community Facilities department, one or more locations could be selected for planning.
- 11.5 In terms of remediating, or rather avoiding if possible, negative effects associated with root zone incursions, much of this needs to be achieved through strategic design and engineering. For example, a structure on piles allows for roots to be preserved, whereas a structure on a strip footing inherently severs roots. The former scenario is obviously a better outcome, but still requires arboricultural measures to preserve trees during construction. This type of input would come during detailed design and would consist of a suite of measures to be implemented on site. For example, procedures to preserve roots, protect the ground and improve or maintain soil structures and hydrology.
- 11.6 The same is true where live crowns need to be pruned. Much of the negative effects of live crown removal can be avoided if structures are positioned strategically. Live crown pruning needs to be carried out by trained and competent arboricultural professional.

³ Based on modelling from the New Zealand Productivity Commission (2018) to achieve carbon neutrality by 2050

12 Conclusions and recommendations

- 12.1 The KiwiRail NoR project requires that parcels (or portions thereof) of land be taken for temporary and permanent occupation, to service the future operation of the rail corridor. This necessitates tree removal (e.g. tree 53) and incursions into tree root zones (e.g. tree 54). Remedial measures are required to address the loss of ecosystem services arising from tree removals (e.g. carbon sequestration deficits). It is recommended that a detailed appraisal of the trees with removal requirements be undertaken during detailed design, and for each tree which needs to be removed, an appropriate planting specification be developed based on lost future benefits (e.g. sections 11.1 and 11.2). At present, a minimum of three, 45-L grade trees need to be planted to address the RMA requirements of tree removal, and a further nine trees need to be planted to address the wider effects of tree removal (i.e. all trees, including those which are not protected) as these relate to carbon sequestration deficits.
- 12.2 Incursions into the root zone areas of trees has the potential to elicit negative effects on tree health if not managed correctly. These negative effects can compromise tree function, predispose them to future stress and reduce longevity. It is recommended that the detailed design be prepared strategically with arboricultural input, and that an appropriately qualified and experienced arboricultural consultant be engaged to prepare a site-specific set of tree preservation measures, to be implemented during physical works, for both temporary and permanent occupations. This is to include above (e.g. tree crowns) and belowground (e.g. roots and soil) tree structures.
- 12.3 We provide no comment on private trees not accessible during our assessment. It is recommended that if tree-related concerns are raised by the occupiers of private properties during the notification process, that an arboricultural consultant be given the opportunity to visit these properties to inspect the tree(s) and make comment on the potential impacts as necessary.

Please contact the author for further information.



Andrew Benson (Ph.D. BSc, FdSc)
Urban tree ecophysiologicalist



Sean McBride
Director

13 Bibliography

- Benson, A., Koeser, A. & Morgenroth, J., 2019a. A test of tree protection zones: Responses of live oak (*Quercus virginiana* Mill) trees to root severance treatments. *Urban Forestry & Urban Greening* 38: 54-63, 10.1016/j.ufug.2018.10.015.
- Benson, A., Morgenroth, J. & Koeser, A., 2019b. The effects of root pruning on growth and physiology of two *Acer* species in New Zealand. *Urban Forestry & Urban Greening* 38: 64-73, 10.1016/j.ufug.2018.11.006.
- Benson, A., Morgenroth, J. & Koeser, A., 2019c. Responses of mature roadside trees to root severance treatments. *Urban Forestry & Urban Greening* 46, 10.1016/j.ufug.2019.126448.
- Čermák, J., Hruška, J., Martinková, M. & Prax, A., 2000. Urban tree root systems and their survival near houses analyzed using ground penetrating radar and sap flow techniques. *Plant and Soil* 219(1/2): 103-116, 10.1023/A:1004736310417.
- Coder, K.D., 1996. Construction damage assessments: trees and sites. University of Georgia. Cooperative extension service forest resources unit FOR96-39: Georgia, USA.
- D'Amato, N.E., Syndor, T.D., Hunt, R. & Bishop, B., 2002. Root growth beneath sidewalks near trees of four genera. *Journal of Arboriculture* 28(6): 283-290.
- Day, S.D., Wiseman, P.E., Dickinson, S.B. & Harris, J.R., 2010. Contemporary concepts of root system architecture of urban trees. *Arboriculture and Urban Forestry* 36(4): 149-159.
- Fini, A., Frangi, P., Mori, J., Sani, L., Vigevani, I. & Ferrini, F., 2020. Evaluating the effects of trenching on growth, physiology and uprooting resistance of two urban tree species over 51-months. *Urban Forestry & Urban Greening*: 126734, 10.1016/j.ufug.2020.126734.
- Grabosky, J., Bassuk, N., Irwin, L. & van Es, H., 2001. Shoot and root growth of three tree species in sidewalks. *Journal of Environmental Horticulture* 19(4): 206-211.
- Hamilton, W.D., 1988. Significance of root severance on performance of established trees. *Journal of Arboriculture* 13(3): 288-292, 10.1080/03071375.1989.9756425.
- Jim, C.Y., 2003. Protection of urban trees from trenching damage in compact city environments. *Cities* 20(2): 87-94, 10.1016/S0264-2751(02)00096-3.
- Kenai, S., Menadi, B. & Khatib, J.M., 2014. Sustainable construction and low-carbon dioxide concrete: Algeria case. *Proceedings of the Institution of Civil Engineers - Engineering Sustainability* 167(2): 45-52, 10.1680/ensu.12.00024.
- Nicoll, B.C. & Armstrong, A., 1998. Development of *Prunus* root systems in a city street: Pavement damage and root architecture. *Arboricultural Journal* 22(3): 259-270.
- Nowak, D.J. & Aevermann, T., 2019. Tree compensation rates: Compensating for the loss of future tree values. *Urban Forestry & Urban Greening* 41: 93-103, 10.1016/j.ufug.2019.03.014.

Nowak, D.J. & Crane, D.E., 2000, The Urban Forest Effects (UFORE) model: quantifying urban forest structure and functions. General Technical Report NC-212. U.S. Dept. of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, MN, USA

Smiley, E.T., 2008. Root pruning and stability of young willow oak. *Arboriculture and Urban Forestry* 34(2): 123-128.

The i-Tree Development Team, 2020, i-Tree Eco, V.6.35. USDA Forest Service, USA.

Watson, G.W., 1998. Tree growth after trenching and compensatory crown pruning. *Journal of Arboriculture* 24(1): 47-53.

Watson, G.W., Hewitt, A.M., Cusic, M. & Lo, M., 2014. The management of tree root systems in urban and suburban settings II: A review of strategies to mitigate human impacts. *Arboriculture and Urban Forestry* 40(5): 249-271.

Appendix A – Tree inventory

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
1	<i>Cupressus macrocarpa</i>	Monterey cypress	20	-	-	-	Good	Fair	Good	Mature	Looks to be on KiwiRail land. Some pruning to clear gantry has occurred. Limited visual inspection owing to access constraints. Signs of previous pruning and occasional limb shedding
2	49 x <i>Cryptomeria japonica</i>	49 x Japanese red cedar	16.8	35.0	1.9	5.3	Good	Good	Good	Mature	
3	<i>Cedrus deodara</i> *	Himalayan cedar	18.4	125.7	3.9	18.9	Good	Good	Fair	Mature	Road reserve tree.
4	<i>Corynocarpus laevigatus</i>	Karaka	4.5	31.8	1.8	4.8	Good	Good	Good	Early-mature	Trunk girth measured at base
5	<i>Metrosideros excelsa</i>	Pōhutukawa	9.5	94.2	3.3	14.1	Good	Good	Good	Mature	
6	<i>Corynocarpus laevigatus</i>	Karaka	4	19.1	1.4	2.9	Poor	Good	Good	Early-mature	Tree is almost dead
7	<i>Corynocarpus laevigatus</i>	Karaka	5	37.7	2.0	5.7	Poor	Fair	Fair	Mature	Crown dieback throughout Cavity at base of tree. Heartwood decay present
8	<i>Metrosideros excelsa</i>	Pōhutukawa	11	76.4	2.9	11.5	Good	Good	Good	Mature	
9	<i>Metrosideros excelsa</i>	Pōhutukawa	11	97.7	3.4	14.7	Good	Good	Good	Mature	
10	<i>Metrosideros excelsa</i>	Pōhutukawa	11	71.3	2.8	10.7	Fair	Good	Good	Mature	Deadwood present throughout crown. Sparseness also present throughout sections of the crown

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
11	<i>Vitex lucens</i>	Pūriri	9.5	55.8	2.5	8.4	Fair	Fair	Good	Early-mature	Deadwood and dieback present throughout crown Lots of sprouting present along the stems
12	<i>Corynocarpus laevigatus</i>	Karaka	7	32.5	1.8	4.9	Poor	Good	Fair	Early-mature	Tree in decline with major dieback present throughout
13	<i>Metrosideros excelsa</i>	Pōhutukawa	9	33.2	1.9	5.0	Fair	Good	Fair	Early-mature	Dieback present upper crown
14	<i>Corynocarpus laevigatus</i>	Karaka	4.2	43.0	2.1	6.4	Fair	Fair	Fair	Mature	Deadwood and dieback present
15	<i>Metrosideros excelsa</i>	Pōhutukawa	11	74.4	2.9	11.2	Fair	Good	Good	Mature	Sparseness and dieback present throughout crown
16	<i>Metrosideros excelsa</i>	Pōhutukawa	6	52.7	2.4	7.9	Good	Good	Fair	Early-mature	Due to suppression from adjacent trees. The crown spreads towards the footpath
17	<i>Alectryon excelsus</i>	Titoki	8.5	58.6	2.5	8.8	Fair	Good	Good	Mature	Large pieces of deadwood throughout crown. Sparseness throughout tree.
18	<i>Podocarpus totara</i>	Tōtara	14	56.3	2.5	8.5	Good	Good	Good	Mature	
19	<i>Corynocarpus laevigatus</i>	Karaka	6.5	37.4	2.0	5.6	Poor	Good	Good	Early-mature	Major dieback and sparseness throughout crown
20	<i>Corynocarpus laevigatus</i>	Karaka	8	47.4	2.3	7.1	Fair	Fair	Good	Mature	Two stems at base which are in contact with each other. Deadwood and dieback present throughout crown

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

† = Protective status unclear due to growing position

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
21	<i>Vitex lucens</i>	Pūriri	9	81.2	3.0	12.2	Fair	Fair	Fair	Mature	Large section at base of tree to a height of 2 m decaying. Roots on one side of tree also decaying, although healthy elsewhere. Deadwood, dieback and sparseness present throughout crown
22	<i>Corynocarpus laevigatus</i>	Karaka	9.5	40.7	2.1	6.1	Fair	Good	Good	Early-mature	Deadwood within upper crown. Lots of sprouting regrowth present at base of tree
23	<i>Alectryon excelsus</i>	Titoki	9.5	34.5	1.9	5.2	Good	Fair	Good	Mature	Multi-stemmed near base.
24	<i>Metrosideros excelsa</i>	Pōhutukawa	13	131.5	4.0	19.7	Good	Good	Good	Mature	
25	<i>Podocarpus totara</i>	Tōtara	9	32.5	1.8	4.9	Fair	Good	Fair	Early-mature	Very small crown due to suppression from adjacent trees.
26	<i>Alectryon excelsus</i>	Titoki	8	55.5	2.5	8.3	Good	Good	Good	Mature	Minor crown dieback present Wound present on second largest stem near base, 800 mm in length, 200 mm in width
27	<i>Podocarpus totara</i>	Tōtara	13	60.2	2.6	9.0	Good	Good	Good	Mature	Very little root flare present. Ground level may have been altered
28	<i>Corynocarpus laevigatus</i>	Karaka	2.5	9.5	0.9	1.4	Good	Good	Good	Early-mature	All that remains is a cluster of sprouting regrowth and old decaying stump
29	<i>Podocarpus totara</i>	Tōtara	13	86.3	3.2	12.9	Good	Fair	Good	Mature	Large surface roots present with visible damage. Multi-stemmed tree with tight union at 1.8 m. Cavity at base of tree 1.2 m in height, 100 mm width. Visible heartwood decay
30	<i>Alectryon excelsus</i>	Titoki	12	64.9	2.7	9.7	Good	Good	Good	Mature	

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

† = Protective status unclear due to growing position

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
31	<i>Corynocarpus laevigatus</i>	Karaka	10	80.5	3.0	12.1	Good	Good	Good	Mature	Overhanging railway areas
32	<i>Corynocarpus laevigatus</i>	Karaka	7.5	38.2	2.0	5.7	Good	Good	Good	Early-mature	Understorey vegetation
33	<i>Metrosideros excelsa</i>	Pōhutukawa	13	71.1	2.8	10.7	Good	Good	Fair	Mature	Tree has been suppressed from adjacent trees and has gone in search of light. Overhangs railway areas
34	<i>Podocarpus totara</i>	Tōtara	12	63.3	2.7	9.5	Good	Good	Good	Mature	Mushrooms growing around roots
35	<i>Alectryon excelsus</i>	Titoki	11	34.1	1.9	5.1	Good	Good	Good	Mature	
36	<i>Vitex lucens</i>	Pūriri	10	81.3	3.1	12.2	Fair	Good	Good	Mature	Sparseness and minor dieback throughout crown deadwood within lower crown overhanging footpath
37	<i>Podocarpus totara</i>	Tōtara	14	74.5	2.9	11.2	Fair	Good	Good	Mature	
38	<i>Metrosideros excelsa</i>	Pōhutukawa	14	65.0	2.7	9.7	Good	Good	Good	Early-mature	
39	<i>Alectryon excelsus</i>	Titoki	10	50.3	2.3	7.5	Good	Fair	Good	Mature	Smaller stem has three pruning wounds close together wounds are callusing over although hollow points are present in area.
40	<i>Corynocarpus laevigatus</i>	Karaka	8	92.0	3.3	13.8	Good	Good	Good	Mature	Girth measurements taken from base

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

† = Protective status unclear due to growing position

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
41	<i>Vitex lucens</i> *	Pūriri	13	92.0	3.3	13.8	Good	Good	Good	Mature	Lower crown deadwood overhanging footbridge
42	<i>Corynocarpus laevigatus</i> *	Karaka	10	63.7	2.7	9.5	Good	Good	Good	Mature	Lots of sprouting at base of tree
43	<i>Podocarpus totara</i>	Tōtara	14	67.5	2.8	10.1	Good	Good	Good	Mature	
44	<i>Platanus orientalis</i> *	Oriental plane	15	85.3	3.1	12.8	Good	Good	Fair	Mature	Crown form dynamic crown with adjacent trees in this area
45	<i>Alectryon excelsus</i> †	Titoki	11	60.5	2.6	9.1	Good	Fair	Fair	Mature	Fruit bodies largest stem at 1.3m from ground. Used hammer to sound for hollow spots. Deadwood present within upper crown
46	<i>Podocarpus totara</i> *	Tōtara	12	64.6	2.7	9.7	Good	Good	Good	Mature	Roots lifting footpath
47	<i>Vitex lucens</i> *	Pūriri	8	64.2	2.7	9.6	Poor	Poor	Good	Mature	Majority of tree is dead although small areas of sprouting is present. Cavity at base of tree
48	<i>Metrosideros excelsa</i> *	Pōhutukawa	5	40.7	2.1	6.1	Good	Good	Good	Early-mature	Multi-stemmed from base. Both stems have large areas of exposed heartwood
49	<i>Cryptomeria japonica</i> *	Japanese red cedar	12	57.0	2.5	8.5	Good	Good	Excellent	Early-mature	Worthy of notable tree status
50	<i>Tristanopsis laurina</i> *	Water gum	7.5	49.0	2.3	7.4	Good	Good	Good	Early-mature	Multi stem from base

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

† = Protective status unclear due to growing position

Tree #	Species	Common name	Height (m)	DBH (cm)	SRZ (m)	TPZ (m)	Overall vitality	Branch structure	Form	Age class	Arboricultural comments and observations
51	<i>Malus sp.</i> *	Apple	4	37.9	2.0	5.7	Good	Good	Good	Early-mature	Phototropic form due to suppression. Overhanging into railway area
52	<i>Fraxinus sp.</i> *	Ash	10	47.1	2.3	7.1	Good	Good	Good	Early-mature	
53	<i>Dacrydium cupressinum</i> *	Rimu	8	34.4	1.9	5.2	Fair	Good	Fair	Early-mature	Suppressed by adjacent trees. Appears to be suffering from recent drought
54	<i>Platanus x acerifolia</i> *	London plane	15	113.0	3.7	17.0	Good	Good	Good	Mature	Overhanging into railway area
55	<i>Tristaniaopsis laurina</i> *	Water gum	5	35.3	1.9	5.3	Good	Good	Good	Early-mature	Suppressed by adjacent trees
56	<i>Salix fragilis</i> *	Crack willow	8	59.7	2.6	9.0	Good	Fair	Fair	Early-mature	Suppressed from adjacent trees. Stem closest railway has a large strip approximately 1.6 m of decaying heartwood.
57	<i>Fraxinus sp.</i> *	Ash	6	44.3	2.2	6.7	Good	Good	Fair	Early-mature	Suppressed by adjacent trees. Deadwood with crown over 100 mm in diameter
58	<i>Corynocarpus laevigatus</i> *	Karaka	5.2	33.7	1.9	5.1	Good	Fair	Fair	Early-mature	Multiple pruning wounds on main stem. Unbalanced crown with small amount of dieback. Cavity at base able to probe to a depth of 500 mm
59	<i>Metrosideros excelsa</i> *	Pōhutukawa	5	43.3	2.2	6.5	Good	Good	Good	Early-mature	
60	<i>Taxodium distichum</i> *	Swamp cypress	12	-	-	-	Good	Good	Excellent	Mature	Viewed from adjacent roadside and appears to be in good condition. Check works nearby

DBH = [trunk] diameter at breast height (1.4 m)

SRZ = structural root zone radius (Coder, 1996)

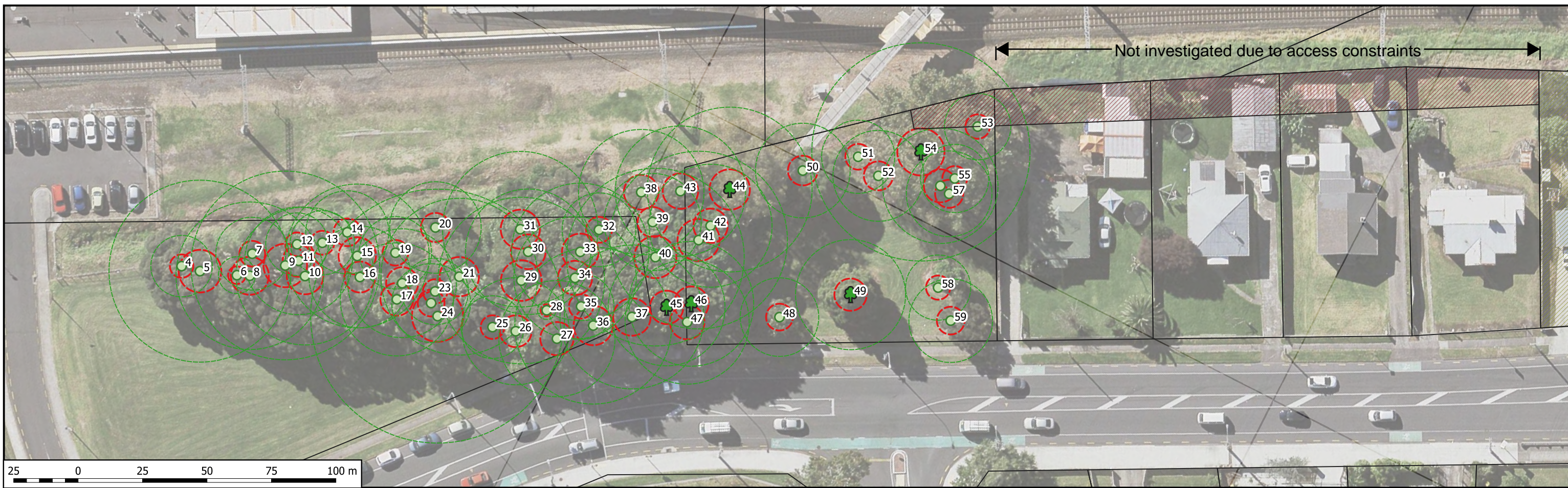
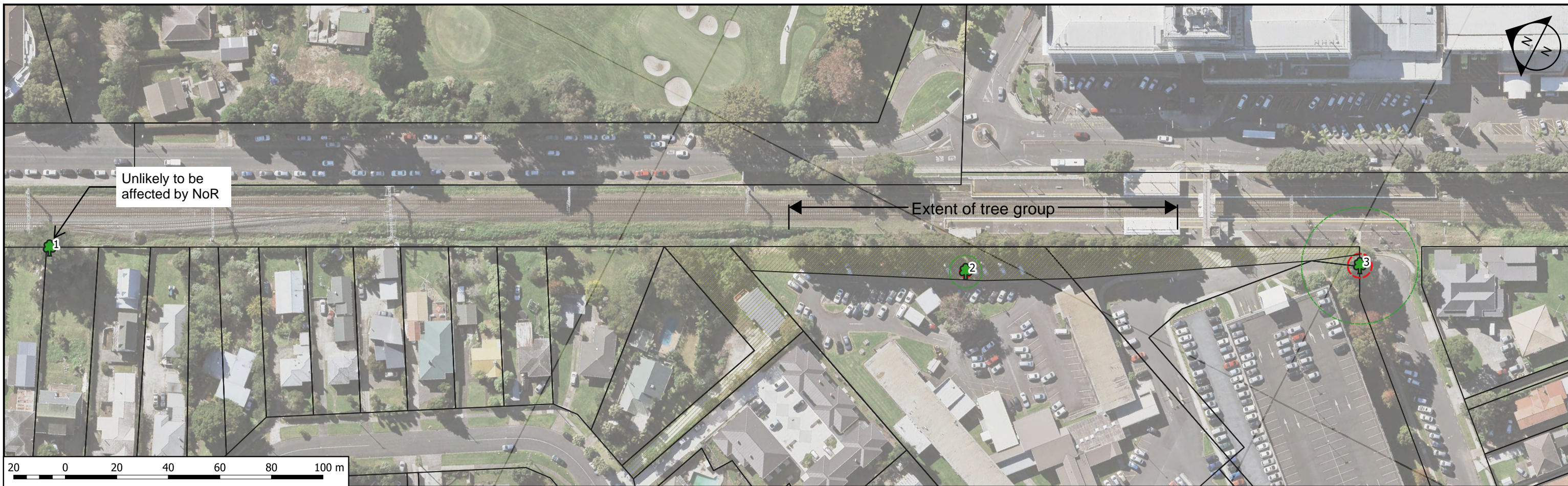
TPZ = tree protection zone radius (Benson, 2019a)

Trees in **bold** scored highly enough to be considered for notable tree status

* = Currently protected tree

† = Protective status unclear due to growing position

Appendix B – Drawings 1642_001 and 002, rev B



- Trees
- Trees worthy of notable status
 - All other trees
 - Structural root zone (Coder, 1996)
 - Tree protection zone (Benson, 2019)
 - Permanent occupation
 - Temporary occupation



Wiri to Quay Park Notice of Requirement
Tree location and land requirement plans



Job ref	1642
Drawing	001
Rev	457 B
	16/06/2020



- Trees
- Trees worthy of notable status
 - All other trees
 - Structural root zone (Coder, 1996)
 - Tree protection zone (Benson, 2019)
 - Permanent occupation
 - Temporary occupation



Wiri to Quay Park Notice of Requirement
Tree location and land requirement plans



Job ref	1642
Drawing	002
Rev	458 B
	16/06/2020

Appendix C – Site photographs



Photo 1: Tree 1 (Monterey cypress)



Photo 2: Tree 3 (Himalayan cedar)



Photo 3: Tree 2 (49 x Japanese red cedar). Tree 3 can be seen in the background (arrow)



Photo 4: Trees 45 (titoki, left) and 46 (totara, right)

Note: The dead tree in the foreground is not tree 46



Photo 5: Tree 49 (Japanese red cedar)



Photo 6: Tree 54 (London plane)

Appendix D – Notable tree scoring schedule

Table 1: Notable tree scoring

Tree number	Species	Age and health	Character or form	Size	Visual contribution	Total score
1	<i>Cupressus macrocarpa</i>	6	5	5	10	26
2	<i>Cryptomeria japonica</i> x 49	4	5	5	10	24
3	<i>Cedrus deodara</i>	4	5	10	10	29
44	<i>Platanus orientalis</i>	4	5	5	10	24
45	<i>Alectryon excelsus</i>	4	5	10	10	29
46	<i>Podocarpus totara</i>	4	5	5	10	24
49	<i>Cryptomeria japonica</i>	5	5	5	10	25
54	<i>Platanus x acerifolia</i>	4	5	10	10	29

Table 2: Average tree dimensions \pm one standard deviation at Middlemore location (1.5 km²)

Species	DBH (cm)	n	Height (m)	n
<i>Cupressus macrocarpa</i>	NA	0	NA	0
<i>Cryptomeria japonica</i>	60.47	1	13.2 \pm 1.8	4
<i>Cedrus deodara</i>	62.6 \pm 3.2	3	15 \pm 3.2	12

Table 3: Average tree dimensions \pm one standard deviation at Papatoetoe location (1.5 km²)

Species	DBH (cm)	n	Height (m)	n
<i>Alectryon excelsus</i>	37.9 \pm 18.7	17	7.7 \pm 2.3	17
<i>Podocarpus totara</i>	63.6 \pm 24.4	14	11.9 \pm 2.4	14
<i>Cryptomeria japonica</i>	NA	0	NA	0
<i>Platanus x acerifolia</i>	42.9 \pm 33.9	11	9.1 \pm 3.9	11
<i>Platanus orientalis</i>	NA	0	NA	0

Wiri to Quay Park (W2QP): archaeological desktop assessment

**report to
Kiwirail**

Hayley Glover



CFG Heritage Ltd.
132 Symonds St
Eden Terrace
Auckland 1010
ph. (09) 309 2426
cfg@cfgheritage.com

Wiri to Quay Park (W2QP): archaeological desktop assessment

report to
Kiwirail

Prepared by:


.....
Hayley Glover

Reviewed by:


.....
Matthew Campbell

Date: 25 June 2020

Reference: 20-1137

© CFG Heritage Ltd. 2020

CFG
HERITAGE

CFG Heritage Ltd.
132 Symonds St
Eden Terrace
Auckland 1010
ph. (09) 309 2426
cfg@cfgheritage.com

Wiri to Quay Park (W2QP): archaeological desktop assessment

1 Introduction

Kiwirail propose upgrading the North Island Main Trunk (NIMT) between Quay Park and Wiri, including the installation of a third main from Wiri to Westfield Junction, as well as new sections of track at the Quay Park freight yard and part of Tamaki Drive. There are 9 archaeological sites recorded in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS) within 200 m of the proposed works areas. An archaeological assessment of effects is required in support of archaeological authority applications to Heritage New Zealand Pouhere Taonga (HNZPT). Michelle Grinlinton-Hancock of Kiwirail commissioned this assessment from CFG Heritage.

1.1 Statutory Requirements

All archaeological sites, whether recorded or not, are protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 and may not be destroyed, damaged or modified without an authority issued by Heritage New Zealand Pouhere Taonga (HNZPT).

An archaeological site is defined in the Heritage New Zealand Pouhere Taonga Act as:

- (a) any place in New Zealand, including any building or structure (or part of a building or structure), that—
 - (i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
 - (ii) provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and
- (b) includes a site for which a declaration is made under section 43(1).

The Resource Management Act 1991 (RMA) requires City, District and Regional Councils to manage the use, development, and protection of natural and physical resources in a way that provides for the wellbeing of today's communities while safeguarding the options of future generations. The protection of historic heritage from inappropriate subdivision, use, and development is identified as a matter of national importance (Section 6f).

Historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

Historic heritage includes:

- historic sites, structures, places, and areas
- archaeological sites;
- sites of significance to Maori, including wahi tapu;
- surroundings associated with the natural and physical resources (RMA Section 2).

These categories are not mutually exclusive and some archaeological sites may include above ground structures or may also be places that are of significance to Maori.

Where resource consent is required for any activity the assessment of effects is required to address cultural and historic heritage matters.

1.2 Scope and limitations

This evaluation is a desktop study only and is not intended as a full archaeological assessment of individual sites. All archaeological sites within 200m of the project area were briefly reviewed and assessed. This report is a preliminary evaluation only and where there is a likelihood of archaeological evidence being disturbed, further archaeological assessment may be required. The assessment and

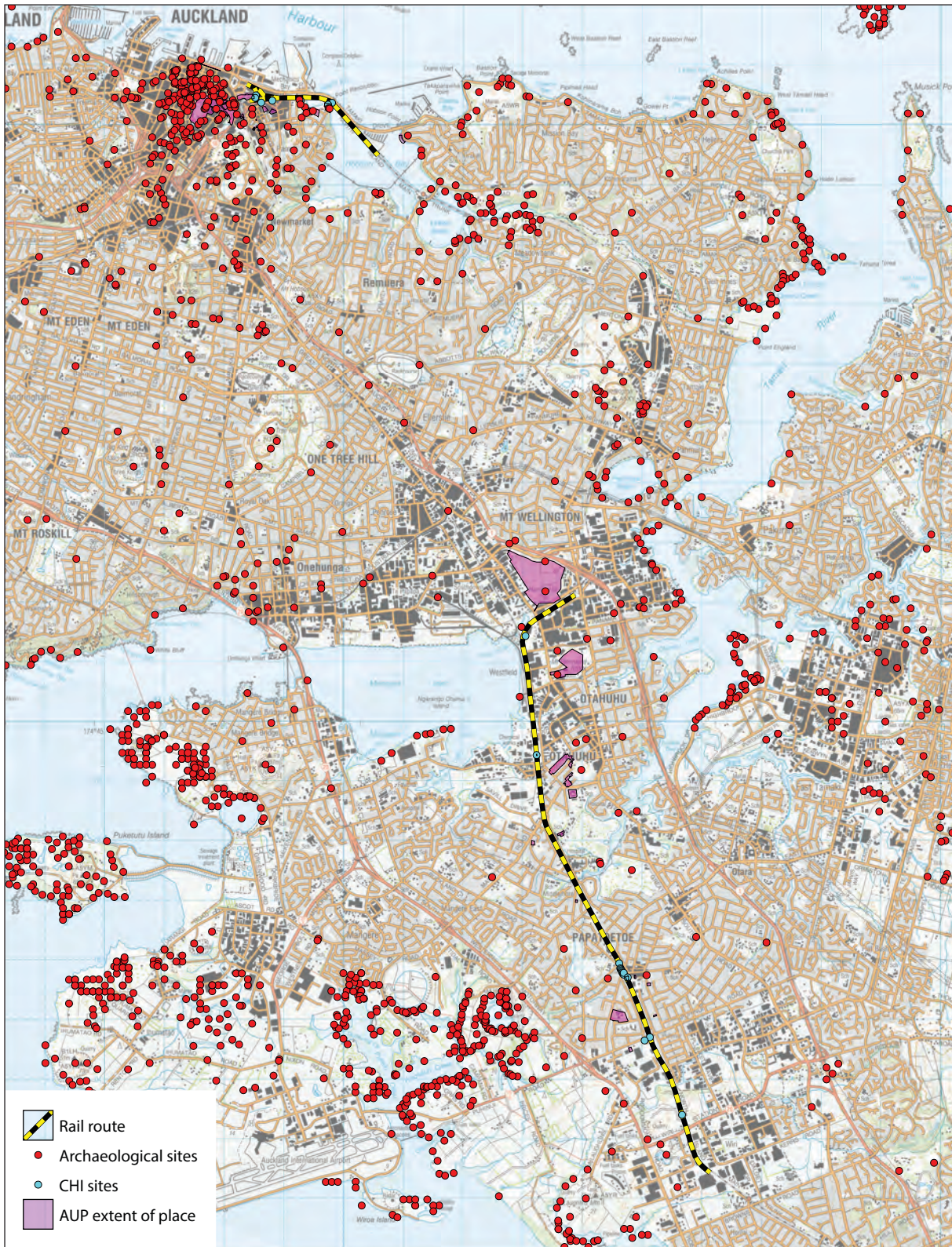


Figure 1. Map showing the path of the railway where works are proposed, and recorded archaeological and heritage sites in the area.

evaluation for all archaeological sites is based on the current information and supporting documentation in Archsite, the online database of the SRS.

This data must be treated as though it were correct and up to date, although even a brief review of the data reveals that some sites which have subsequently been destroyed by development are still recorded as intact and the record has not been updated to reflect this.

Archaeological sites have been recorded since the 1950s and the quality of site information is variable. Sites were initially recorded on 100 yd grid references, which were converted to 100 m grid references as the map data became metricated in the 1980s. Site locations potentially have only a 200 m accuracy. Since the mid-1990s sites recorded by hand-held GPS are generally located to ± 5 m.

While the distribution of recorded archaeological sites indicates areas where pre-European Māori occupation was concentrated, the record is far from complete or comprehensive. A lack of recorded sites cannot be taken to mean that no archaeology will be found during works.

2 Methodology

The NZAA SRS was searched for records of archaeological sites in the vicinity and incorporated into the Project GIS. Archaeological site reports were accessed from the Heritage New Zealand Pouhere Taonga (HNZPT) digital library and old maps and plans held by Land Information New Zealand (LINZ) were accessed using QuickMap. Auckland Council's Cultural Heritage Inventory (CHI) and GeoMaps were examined for information on Historic Heritage.

3 Background

3.1 Quay Park

The Auckland isthmus / Tāmaki Makaurau, 'the land of a hundred lovers' or 'the land desired by many', was densely settled early on in pre-European Māori history, including the area around Quay Park, which had a very different landscape than is seen today. The land had sheltered harbours, fertile volcanic soils, and easy access to marine resources.

The landscape around the Quay Park area is highly modified, with the proposed works largely situated on reclaimed land. Much of the reclamation in the Downtown Auckland / Britomart area was carried out in the 19th century, beginning in 1859, with additional reclamations happening throughout the 20th century. The vast majority of reclaimed land around Mechanics Bay, St Georges Bay, and Judges Bay is from post-1900 operations, with the exception of a small strip of land at the original Mechanics Bay coastline (Figure 2).

Kelly's map of Māori place names in Tāmaki Makaurau also illustrates the pre-1840 coastline as marked in Figure 2 (Kelly 1940). Te Tōangaroa / Mechanics Bay was west of the proposed works area. The Māori name can be translated to 'the dragging of a waka across a long distance.' This refers to the fact that the tide in this bay went out very far, so if a waka was landed at low tide it had to be dragged a long way to the beach. When European settlement began in Auckland, this bay was the location of the dwellings of the first workmen employed by the government, as well as sawmills and boat-yards, giving it the name Mechanics Bay (Campbell n.d.). East of this was Wai o Taikehu / St George's Bay. Taikehu was an ancestor of Ngāi Tai who arrived on the *Tainui*, and the Māori place name can be translated as 'the waters of Taikehu.' The easternmost point along this coastline is at Judges Bay and Taurarua / Point Resolution, where Judge Martin and Attorney General Swainson built houses in 1841. Taurarua has been translated as 'two ropes,' potentially referring to these two men who were supposed to be administrators of British justice (Campbell n.d.)

This coastline was overlooked by elevated land around Parnell and Pukekawa / the Domain, where significant evidence of pre-European Māori settlement has been recorded. Sites at Pukekawa include pā, battlegrounds, terracing, storage pits, midden, and other evidence of settlement both near the pā and the coast. In the 1840s Te Wherowhero had an official house at Pukekawa (Bulmer 1994).

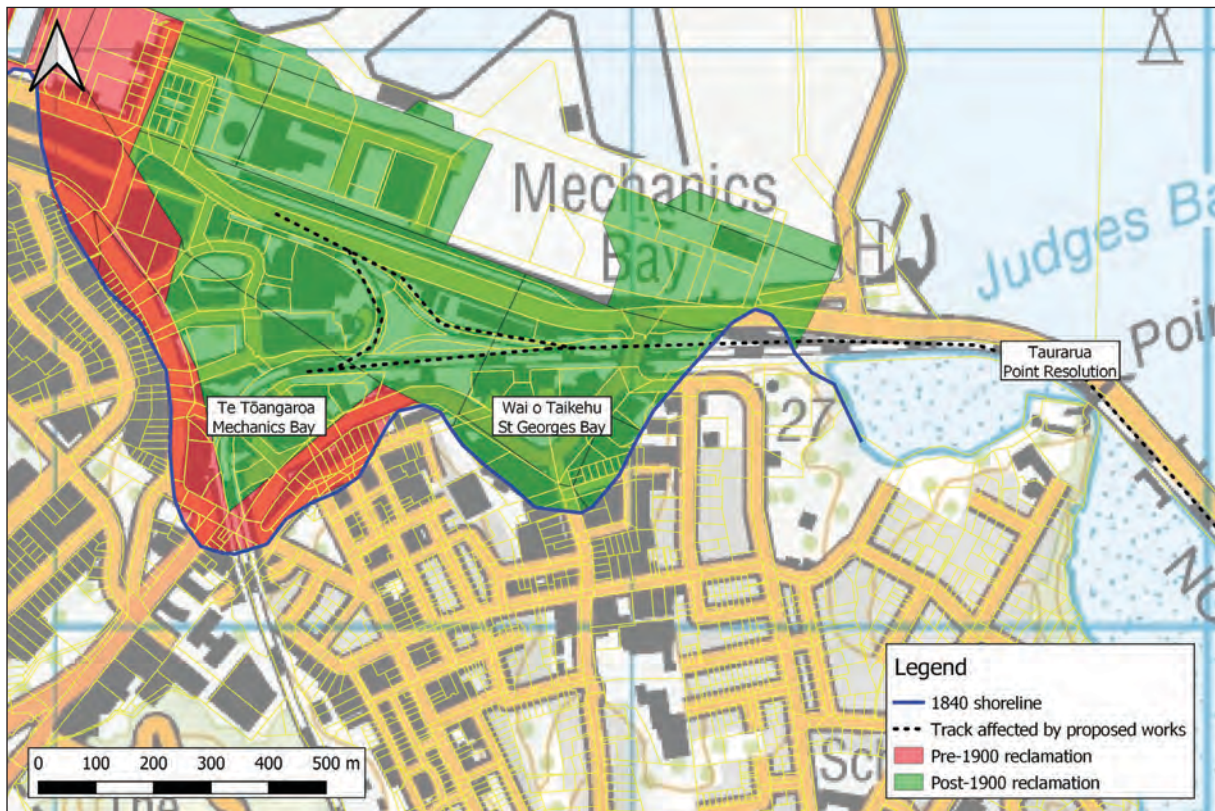


Figure 2. Map of the Quay Park area showing the 1840 coastline and reclamations near the proposed works area.

In 1840 Auckland was founded as the government capital by Governor Hobson, who named it after his patron Lord Auckland. Hobson purchased around 3000 acres of land from Ngāti Whātua in the same year, then in 1841 proceeded to sell the land to settlers at a much higher price than he paid. An influx of settlers arrived in the area and a commercial hub began to build up in the Auckland CBD area (McClure 2007; Stone 2001). By 1843 there were 3000 people recorded living in Auckland, and that number grew to more than 12,000 people by 1870 (Bickler et al. 2005)

A significant amount of archaeological research has been carried out around the Auckland waterfront and surrounding areas, and it is not within the scope of this assessment to describe all of these investigations. A lot of work has occurred with the development of the Britomart and Commercial Bay areas, which are located on pre-1900 reclamations. The Britomart Archaeological Project (Bickler et al. 2005) gathered information on the wharves, jetties, seawall and railway station, investigating how these changed the workings of Auckland Harbour over time. Numerous 19th century artefacts were discovered, but no information directly related to pre-European Māori settlement was encountered (Bickler et al. 2005).

Archaeological monitoring was also undertaken at the Quay Park development in 1996 with the aim of learning more about the pre-1900 reclamation, but only 20th century material was encountered (Clough and Prince 1997). In 2000, at the AMP tower on the corner of Albert and Quay Street, information regarding the 1878 graving dock was recovered and a small section exposed for the first time (Clough et al. 2001). Further monitoring in the Britomart area, in 2001 and 2018, showed that 20th century developments including roading and services have intruded into the upper levels of some of the pre-1900 reclamations (Clough and Prince 2001; Larsen and Clough 2018). With earthworks for the construction of the new shopping centre at Commercial Bay, between 2016 and 2018, brick foundations of the Palmerston Building were located, as well as various other artefacts and building foundations (Judge and Clough 2018).

3.2 Westfield and surrounds

Westfield is situated in Ōtāhuhu, near the Mangere Inlet. Ōtāhuhu was an important strategic location in pre-European Māori history, and was settled from an early period. The narrow strip of land between the Tamaki River and the Manukau Harbour was the location of several portages (Figure 3). Two particularly well-known ones are Te Toangakiotahuhu or Ōtāhuhu, which was one kilometre long, crossing from the head of Ōtāhuhu Creek through to the Mangere inlet, and Karetu, which was two kilometres long, following Anns Creek across the base of Hamlins Hill until it reached the Tamaki River (Furey 1986). The Pukaki portage is located further south in Papatoetoe, at Pukaki Creek. Traditions state that the Ōtāhuhu Portage was first established with the hauling of the *Tainui* from the Tamaki River to the Manukau Harbour, and it remained in use at the time of European contact (Furey 1983). These portages played a vital role in communication and transportation, making the area strategically important, both economically and militarily.

Two prominent volcanic cones were present within 1 km of Westfield; these were Ōtāhuhu / Mount Richmond (R11/13) and Te Apunga o Tainui / McLennan Hills (R11/10), both of which were pā sites. Te Apunga o Tainui / McLennan Hills has been almost entirely destroyed by quarrying (Furey 1986; Campbell and Ross-Sheppard 2013). Soils in the area were fertile, well drained volcanic loams suitable for the cultivation of kumara, and several pre-European Māori settlement sites have been recorded in the general area.

In the 1830s European contact increased and the area became part of the Hamlin Land Grant as land sales began to occur (Furey 1983). With the musket wars in the early 1800s, the Tamaki portages were used frequently. This may have led to occupation of a more intermittent or temporary basis on the Tamaki isthmus until 1840, when European settlement began to occur in the area (Sewell 1992). In the late 19th and 20th centuries, much of the Mangere Inlet foreshore was reclaimed, particularly with the construction of the North Island Main Trunk. The pre-reclamation shoreline of the inlet is visible in an 1845 survey map (SO 683), and is marked on the maps used in this report (Figure 6).

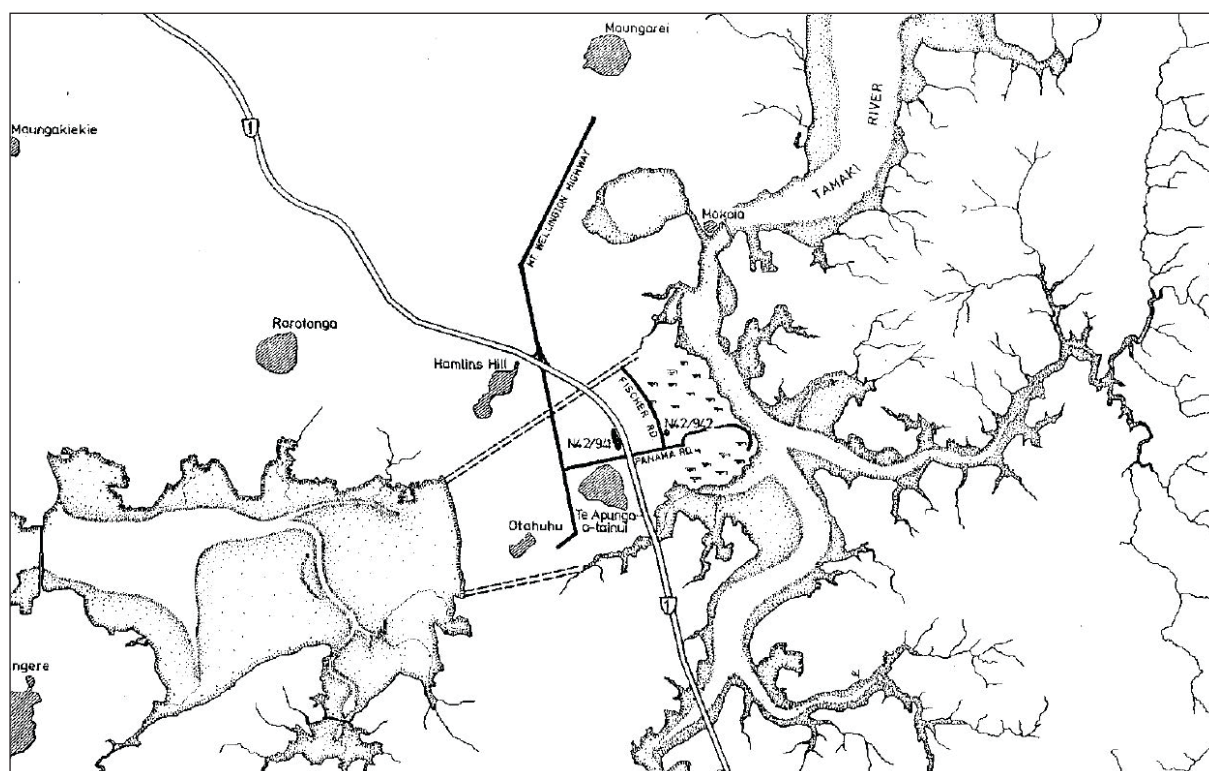


Figure 3. Portion of map from Furey (1986) showing the locations of Te Toangakiotahuhu and Karetu portages (dashed lines) (Furey 1986: 3).

While there are numerous archaeological sites recorded near Tāmaki River and the Manukau Harbour, there is a lack of sites recorded in Ōtāhuhu and around the Mangere Inlet. Given the importance of this area as a location for settlement, cultivation, and crossing the Tamaki Isthmus, this apparent lack of sites likely reflects a lack of targeted archaeological research and destruction of evidence by development, rather than a lack of occupation.

A well known site in the area is R11/898, the Westfield site, which has been subject to several archaeological investigations. This site represents an undefended settlement with archaeological features identified including postholes, pits, evidence of cooking and stoneworking, including midden and various artefacts, probably associated with occupation of the pā at Te Apunga o Tainui (Furey 1983, 1986; Sewell 1992). The site was occupied in the late 16th and early 17th centuries (Sewell 1992). Several investigations at Mutukaroa / Hamlin's Hill have also been undertaken, with a focus on evidence related to European farming (Lawlor 1999; Phillips 2000), while five phases of pre-European Māori occupation were excavated over several seasons on the southern knoll (Pearce and Walton 1983).

3.3 *Wiri and surrounds*

Situated east of the Manukau Harbour, early pre-European Māori settlement in Wiri and surrounding areas would have been intensive. Settlement of the general area can be traced back to the arrival of the *Tainui*, which entered the Manukau Harbour in the 14th century (Murdoch 1990). The harbour is thought to have been first pointed out by a priest aboard the waka, Taikahu, and was named by the *Tainui* captain Hoturoa (Williams 2016).

With its rich volcanic loam soils and the abundance of volcanic rock in the area, Wiri was highly suited for cultivation, and Māori built an extensive stonefield gardening complex in the area, associated with pā at Matukutūruru / Wiri Mountain (Te Manurewa o Tamapahore Pā) and Matukureia / McLaughlins Mountain. The stonefields have been referred to by different names, including the Matukureia Stonefields and the Matukurua Stonefields (Bickler et al. 2013). The gardens formerly covered approximately 500 ha with terraces, stone walls, and stone and earthen mounds (Figure 4). These structures probably served a variety of purposes, including boundary markers, soil temperature/moisture control and wind/frost protection (Bulmer 1983; Rickard 1985). These features enabled successful cultivation in areas with limiting factors like moisture deficits and leaching (Rickard 1985).

One of the first Europeans to settle in the area was McLaughlin, a farmer who bought more than 1000 ha of the Clendon Grant. Lava outcrops and scoria made ploughing impractical, but McLaughlin built dry stone walls in various areas to fence in blocks for grazing, probably destroying and building over pre-European Māori constructions (Cramond et al. 1982).

Extensive quarrying in the area took place from the latter half of the 19th century onwards, with Matukutūruru / Wiri Mountain in particular used as a quarry by the Railways Corporation from 1915 (Foster 1988). This resulted in the destruction of much of the gardening complex and maunga, almost completely levelling it (Cramond et al. 1982).

Archaeological research in Wiri has been largely focussed on the two pā and the stonefield systems, in large part driven by the construction of the Wiri Oil Terminal and the Wiri Railway Station, which destroyed large sections of the stonefields. Various small scale excavations and mapping projects have taken place over the years.

In 1982, ahead of the construction of the Wiri Oil Terminal, Cramond and colleagues carried out survey and mapping of the stonefields (R11/1187) with the goal of identifying and describing each prehistoric feature, with mapping focussed on ensuring the relative positions, alignments and orientations of features were correctly recorded. Seventeen structures identified as being of high archaeological significance were mapped in more detail (Cramond et al. 1982). A brief review of the stonefields was also undertaken in 1983 by Rickard and colleagues as part of their survey of stone structures across South Auckland (Rickard et al. 1983), and a more in depth investigation of the garden system was presented by Bulmer in the same year (Bulmer 1983).

In 1984, prior to quarrying for the Wiri Railway station, Veart and colleagues mapped the area (R11/1188), with the goal of producing a more complete and detailed map than was obtained at the Wiri Oil Terminal site (Veart et al. 1984). As the features encountered numbered well over 1000, it

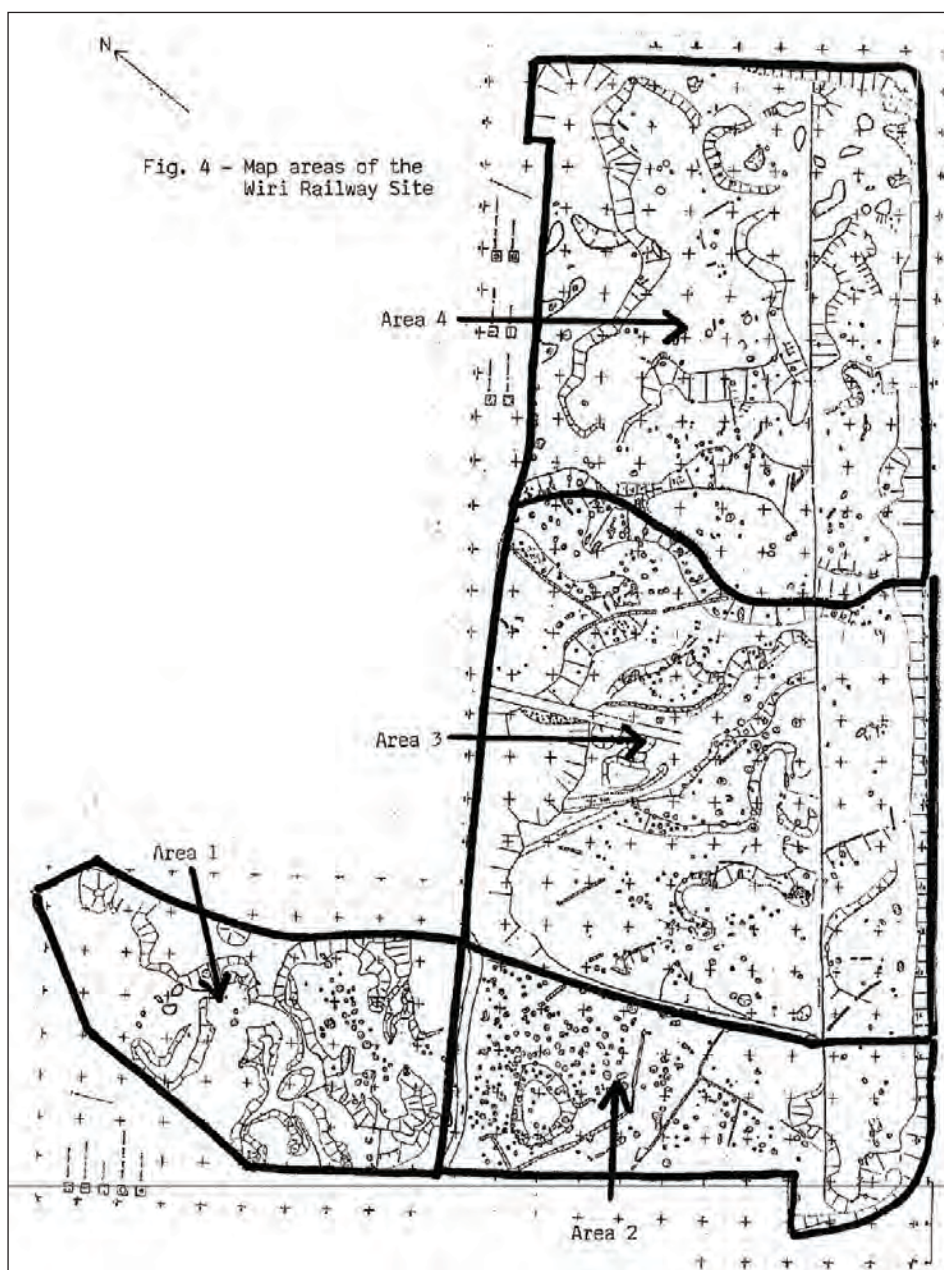


Figure 4. Map of the Matukureia Stonefields near the Wiri Railway Station (Veart et al. 1984:16).

was not possible to map every feature point by point, but the overall area covered by each feature is recorded (Figure 4). Features were categorised as stone walls, stone alignments, mounds, standing stones, stone facing, terraces and platforms, ditches, stone scatters, stone arrangements, fill, shaped depressions, and buried soil horizons. Further investigations at the Wiri Railway Site (R11/1188) were undertaken by Rickard in 1985, including the excavation of several mounds and terraces as well as the construction of experimental mounds (Rickard 1985). Previous excavations had also been carried out on three mounds north of Matukutūru / Wiri Mountain by Sullivan (1974).

In 1988, Foster surveyed and mapped surviving pre-European Māori features at Matukutūru / Wiri Mountain (R11/32), including terraces, depressions, midden deposits, mounds and stone walls. Two key areas where archaeological remains were still present were identified, with one representing domestic occupation, and the other a transitional zone between the pā and the stonefield gardens (Foster 1988). More recently, from 2008 to 2011, Bickler and colleagues undertook an archaeological assessment and subsequent monitoring of quarry extensions at Matukureia / McLaughlins Mountain

(R11/47) (Bickler et al. 2013). Archaeological remains which were exposed included pits, stone alignments, midden and fire cracked rocks representative of food preparation areas, and obsidian flakes. Radiocarbon dates suggested that occupation in the project area was taking place during the 16th and 17th centuries AD (Bickler et al. 2013).

3.4 North Island Main Trunk

From 1870 railway development became a critical infrastructure development project, led by future Premier Julius Vogel. This development was intended to promote growth and immigration (Burgess and Knight 2010). The first part of the North Island Main Trunk (NIMT), which would eventually link Auckland and Wellington, was a 66 km section of track connecting Auckland and Mercer (Cowan 1928).

Preparation for a railway line heading south from Auckland, initially planned to reach Drury, took place from the early 1860s. The first survey for an Auckland to Drury railway was carried out in 1862 by Harding and Stewart (Ball 2009). In 1864, Drury's potential as an important settlement linking Auckland to the Waikato was recognised, with the Waihoihoi coal mine, near-constant military presence from the Waikato Wars, and multiple commercial opportunities. Rail transport was an attractive option to enhance these and improve transport connection with Auckland (Brown and Brown 2017). On 16 February 1865, the first sod for the Auckland to Drury railway was turned (*Daily Southern Cross*, 17 February 1865: 5). However, in 1866 the rail link was cancelled as troops left Drury and the financial situation worsened.

Works did begin on the railway line in Auckland in 1865, from Mechanics Bay to the Auckland Domain, along the route of the Waipapa Stream (Salmon Reed 2009). Planning for the railway south recommenced in 1870 with Vogel's scheme, with a newly proposed terminus at Mercer (Ball 2009). The route was resurveyed by Stewart and Harding and in August 1872 a new contract was made with John Brogden and Sons. The Auckland to Onehunga line was constructed in 1873, and the construction of the Auckland to Mercer line was completed to the Waikato River in April 1875, where the rail service could link up with paddle-steamers (Cowan 1928; Merrifield 2009). Later on, in 1930, the Westfield Deviation was constructed (Salmon Reed 2009).

From Mercer, the NIMT continues southward to Wellington. The last spike of the final track for the entire line, from Auckland to Wellington, was driven on 6 November 1908, marking the formal opening of the line (Atkinson 2010). A two-day service began on 9 November 1908, and an overnight express service began on 14 February 1909.

4 Quay Park desktop assessment

There are seven recorded archaeological sites with points within 200 m of the proposed works at Quay Park. Three of these are pre-European Māori sites, including two pā (R11/84, R11/85) and a midden/oven site (R11/1403). The remaining four sites are a health care site (R11/1558), a brickworks (R11/1696), a military fort (R11/1718), and a house site (R11/2681). The reclamations in the proposed works area are not archaeological sites as they occurred in the 20th century.

There are also six historic heritage extents of places within 200 m of the proposed works in this section. One of these refers to archaeological site Fort Resolution (R11/1718; 1570), and the remainder are 19th and 20th century sites including the Dilworth Terrace Houses (1634), the NZ Loan and Mercantile Wool Store (1889), Auckland Railway Station (2067), St Stephen's Chapel (1707), and the Parnell Baths (1708).

A further seven items are listed in the CHI. These include the Parnell Wharf (577), the Parnell Railway Signal Box (18734), the Parnell Baths (416), Parnell footbridge (19637), the Netherland Memorial (22068), and Pohutukawa trees (12628, 12631). Note that sites dating to the 20th century are not protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014, but may be subject to additional controls by Auckland Council if they are to be affected by works.

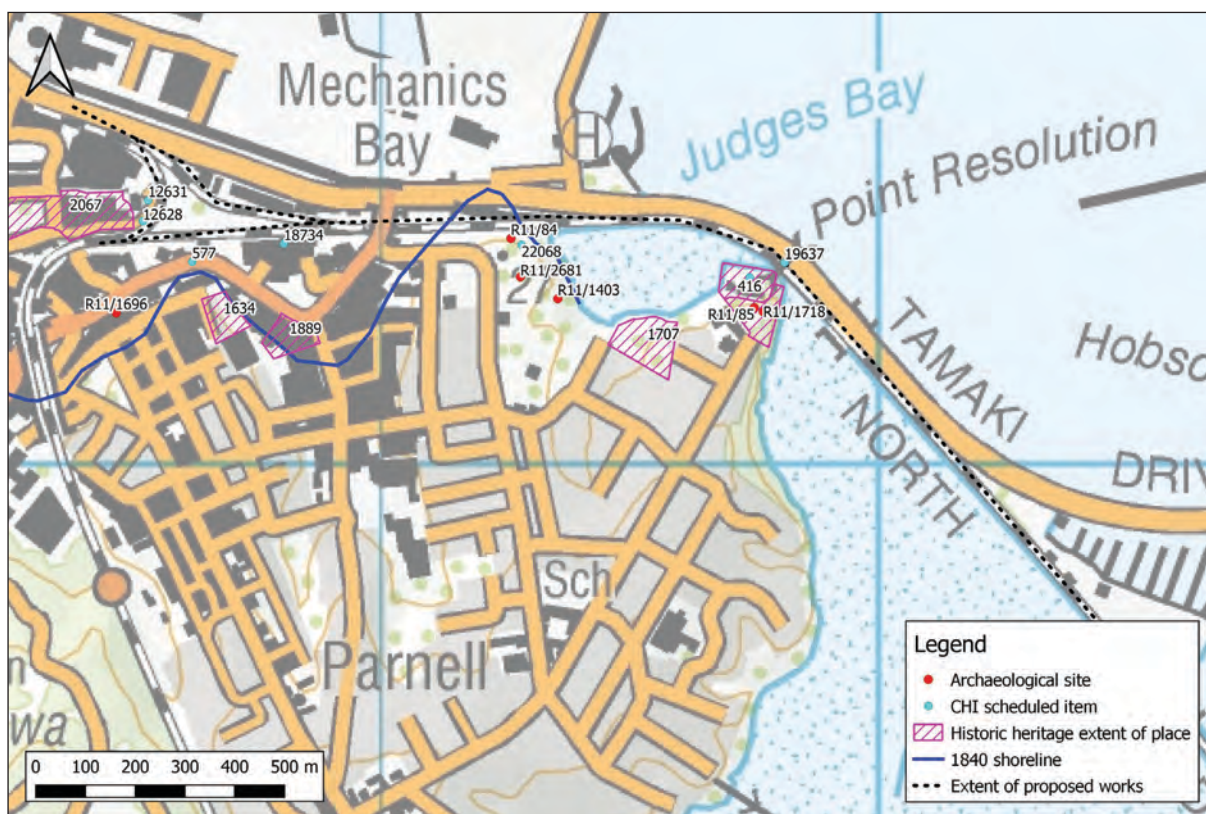


Figure 5. Map of archaeological sites and historic heritage extents of place within 200 m of the proposed works at Quay Park, as well as CHI items in the immediate vicinity of the works.

4.1 Archaeological sites

4.1.1 Mataherehere Pā, R11/84

This site refers to the likely location of Mataherehere, a headland pā. Extensive landscaping of the Dove Myer Robinson Park as well as cuts for the railway mean there is almost no surface evidence present. The only evidence of settlement noted in the SRS is a terrace with midden scatter immediately west of Judges Bay Road. If earthworks are carried out in this area, it is possible that subsurface material could be revealed, as the railway cuts through the location of the original headland.

4.1.2 Pā, R11/85

R11/85 is another pā site, on Point Resolution. Shell midden has been recorded around St Stephens Chapel and cemetery and along the cliff, but no other features related to a pā have been recorded. The site is now occupied by various buildings. This site is outside the scope of works.

4.1.3 Midden/oven, R11/1403

This is a midden site consisting of cockle shell eroding out of a bank next to a track at the Dove Myer Robinson rose gardens. The site is in poor condition, and is outside the scope of works.

4.1.4 Health care, R11/1558

This site refers to a 19th century healthcare building which may have been demolished in 1987. The site was recorded as being at the junction of the Strand and Augustus Terrace but no other information is provided. This site is outside the scope of works.

4.1.5 Commercial, R11/1696

R11/1696 is the location of Frederick Archard and Brown's Brickworks. The site is likely beneath the Strand, approximately 150 northeast of the Parnell Rise intersection and much of it is likely preserved beneath fill. The business was in operation from 1862 to 1874, taken over by Nathan Harker's Patent Brickworks in 1875. The Brickworks closed in the late 1880s. This site should be outside the scope of works.

4.1.6 Fort Resolution, R11/1718

This is the site of Fort Resolution, a military fort built on Point Resolution in 1885. Two guns were mounted 5 m from the cliff edge (one of these is on display in Albert Park), and there were subterranean loading galleries and passages. The site was surrounded by a ditch and bank with a drawbridge. Earthworks are likely intact beneath the fill used to bury the fort in 1914. This site is outside the scope of works.

4.1.7 Kilbryde House, R11/2681

R11/2681 is the location of John Logan Campbell's house, Kilbryde, built in 1881 with an Italianate garden. It was demolished in 1922 after being deemed unsafe. Landscape features are still present within Dove Myer Robinson park, including two broad lateral terraces, path alignments, and trees. The house site is outside of the scope of works.

4.2 *Historic heritage extent of place*

All six historic heritage extents of place within 200 m of the proposed works are outside the scope of works and will not be discussed further or assessed according to the Auckland Council Methodology for Evaluating Historic Heritage Significance (2019).

4.3 *Auckland Council CHI*

4.3.1 Parnell Baths, 416

The Parnell Baths were originally constructed in 1914 with investigations into potential locations beginning in 1912. The location within the bay meant the tide could be utilised to fill the baths, though construction of the railway in this area in 1926 prevented water being drawn directly from the harbour, causing the baths to be closed for some time. In the late 1930s chlorination and filtration plants were installed. This site is outside the scope of works.

4.3.2 Parnell Wharf, 577

The Parnell wharf was likely constructed before 1880 on the point between St Georges Bay and Mechanics Bay and destroyed later when the area was reclaimed. This site is not likely to be affected by works.

4.3.3 Pohutukawa, 12628 and 12631

These are both botanical sites; 12628 is a singular pohutukawa tree which may or may not still be present off Ronayne Street, and 12631 is a group of four pohutukawa trees along Beach Road, noted as being less than 100 years old as of 2012. The trees should all be outside the scope of works.

4.3.4 Parnell Signal Box, 18734

This item refers to the former Parnell Railway Signal Box. It was constructed in 1930 and was renovated in 2009/2010, though many original features were retained including brass levers and the original mimic panels. This item is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014, but may be subject to additional controls by Auckland Council if they are to be affected by works. This site should be outside the scope of works.

4.3.5 Point Resolution footbridge, 19637

The Point Resolution footbridge was proposed by Auckland City Council in 1928 and designed with a bowstring truss design. The contract for constructing the steel trusses was given to the Mason Brothers in 1929, and the bridge was completed later that year. This site should be outside the scope of works.

4.3.6 Netherlands memorial, 22068

Item 22068 is the Netherlands memorial which was unveiled in 1963 after five months of construction, with different metal badges representing different Netherlands armed forces service units. As a late 20th century site this item is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 but may be subject to additional controls by Auckland Council if they are to be affected by works. This site should be outside the scope of works.

4.4 Summary

The only site with a possibility for material to be encountered during works is the probable location of Mataherehere Pā (R11/84). This is the only location in this section of the railway which is situated on part of the original coastline; the remainder of the land was all reclaimed in the 20th century. The rest of the sites/items reviewed should be outside the scope of works. This section of the railway line is likely to be almost entirely of 20th century construction.

5 Westfield Junction to Wiri Station desktop assessment

There are two recorded archaeological sites with points within 200 m of the proposed works between Westfield Junction and Wiri Station. These are a pre-European Māori portage (R11/2147) and a pre-1900 industrial water supply (R11/1635). Additional pre-European Māori sites within 500 m, at Mutukaroa / Hamlins Hill (R11/142), Ōtāhuhu (R11/13), Matukutūruru / Wiri Mountain (R11/32), and the Matukorua Stonefields (R11/1188), were also reviewed as their original extents are significantly larger than the SRS point location and could extend into the proposed works area.

There are also eight historic heritage extents of places within 200 m of the proposed works in this section. One of these refers to pre-European Māori site R11/142 at Mutukaroa / Hamlins Hill (1572), and the remainder refer to 19th and 20th century structures including residences (1477, 1482, 2564), structures associated with the railway (1473, 2578), the Papatoetoe Town Hall (1468), and King's College historic campus (1666).

Fourteen additional CHI scheduled items are present in the immediate vicinity of the rail corridor. These items include the Ōtāhuhu Portage (361), the Papatoetoe Railway Station (12487), parts of which date to 1875, and 11 post-1900 sites related to the railway. An additional two items referring

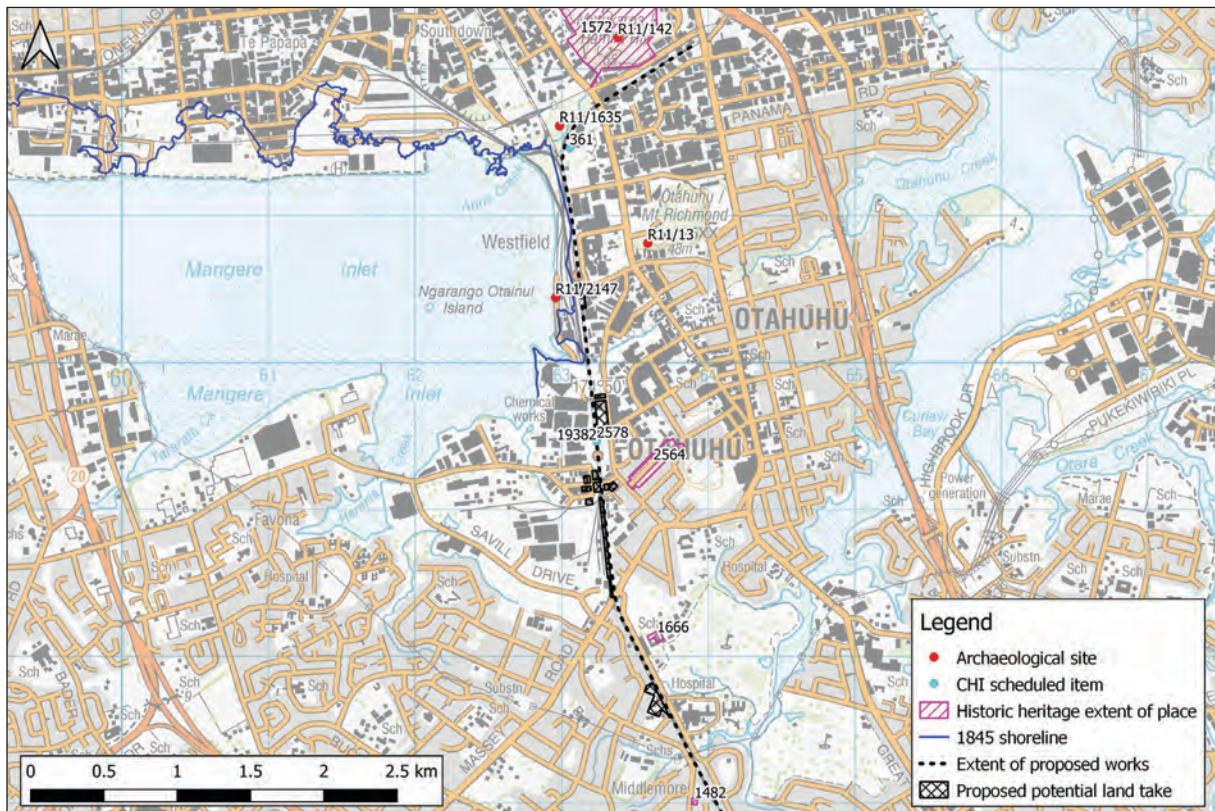


Figure 6. Map of archaeological sites and historic heritage extents of place within 200 m of the proposed works between Westfield Junction and Papatoetoe, as well as CHI items in the immediate vicinity of the proposed works.

to a WW II military base (15944 and 17015) have an extent which is immediately adjacent to Puhinui Station, though one of the markers is in the wrong location, west of the Puhinui interchange. These items have also been included in the assessment. Note that sites dating to the 20th century are not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 but may be subject to additional controls by Auckland Council if they are to be affected by works.

5.1 Archaeological sites

5.1.1 Ōtāhuhu Pā, R11/13

This is the location of the pā at Ōtāhuhu / Mount Richmond. Beginning in 1870, eight areas on the maunga have been quarried, damaging many of the archaeological features. Archaeological evidence is still present, particularly on the lower slopes on the northern side. This site should be outside of the scope of works.

5.1.2 Matukutūruru Pā, R11/32

This is the location of the pā at Matukutūruru / Wiri Mountain. The vast majority of the maunga and the pā have been quarried away and destroyed. A small section within the Wiri Cave Scientific Reserve has some features remaining, but this is beyond the scope of works.

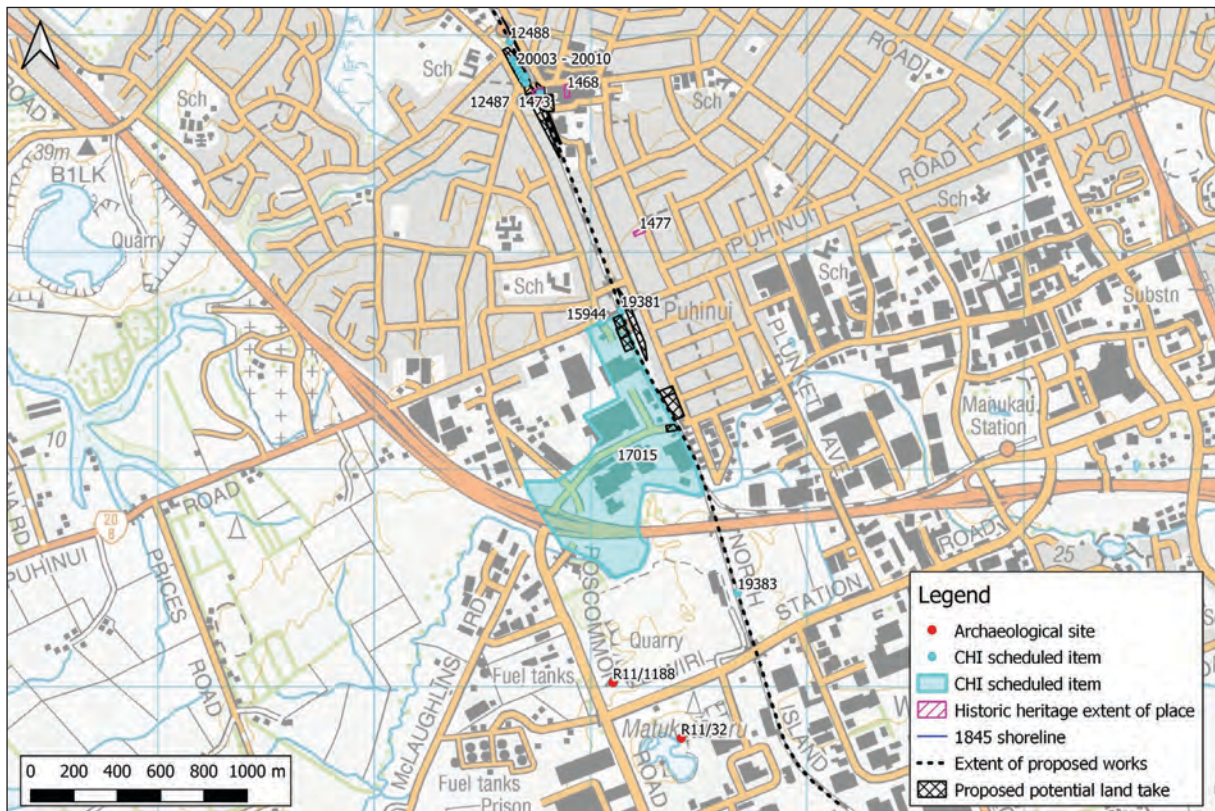


Figure 7. Map of archaeological sites and historic heritage extents of place within 200 m of the proposed works between Papatoetoe and Wiri Station, as well as CHI items in the immediate vicinity of the proposed works.

5.1.3 Pit/terrace, R11/142

R11/42 refers to settlement areas around the pā on Mutukaroa, with at least three occupation areas noted on the spur, and at the northern and southern ends of the main ridge. The site is immediately north of the railway line and if earthworks are undertaken in this area there is a small chance that cultural material may be encountered.

5.1.4 Māori horticulture, R11/1188

This site, sometimes termed the Wiri Railway Site, refers to the section of the Matukoroa Stonefields bounded by Wiri Station Road on the south, Roscommon Road on the west, and the railway on the east. The site has largely been destroyed by quarrying in the 1980s with additional damage in the 1990s. Numerous stone structures and mounds were present here, associated with Matukutūruru / Wiri Mountain, as discussed above. Only the smallest section of this site remains undeveloped, and this is outside the scope of works.

5.1.5 Industrial, R11/1635

R11/1635 is a rock cut trench which was for water supply to the Taniwha Soap Company. The company was founded in 1878, and this trench is shown on a plan from 1904 so may be of late 19th century construction. The trench is cut into the lava up to 2 m in depth with the spoil stacked adjacent to the trench. The trench, as well as an associated well, are on the eastern boundary of the rail

corridor, but no works are scheduled for this part of the track. This site should be beyond the scope of works.

5.1.6 Te Toangakiotahuhu / Ōtāhuhu Portage, R11/2147

Te Toangakiotahuhu or the Ōtāhuhu Portage crosses the Tamaki isthmus at Ōtāhuhu Creek, reaching the Mangere Inlet near the location of R11/2147. The portage is also recorded as item 361 in the CHI. There is unlikely to be any evidence remaining related to the portage itself, particularly with the extent of development in the area. This site should be outside the scope of works, though there is a very small potential for unrecorded archaeological sites related to pre-European Māori settlement in this area to be encountered where earthworks are undertaken.

5.2 *Historic heritage extent of place*

Of the eight historic heritage extents of place, five are outside the scope of works and will not be discussed further. These are two residences (01477 and 01482), Papatoetoe Town Hall (01468), Kings College and associated buildings (01666), and the Lippiatt Road housing area (02564). The Otahuhu Railway Signal Box (02578) and Mutukaroa / Hamlins Hill (01572) are in the immediate vicinity of the railway corridor (with 02578 within the railway corridor) but works will remain outside of the extent of place. As such, these sites have not been assessed according to the Auckland Council Methodology for Evaluating Historic Heritage Significance (2019).

Works are taking place within the Papatoetoe Railway Station (01473) historic heritage extent of place, though the building itself will not be affected. This item has been assessed under Auckland Council Provisions below.

5.3 *Auckland Council CHI*

Of the sixteen items scheduled in the CHI in the vicinity of the railway corridor, two have already been discussed in the above sections and will not be discussed further in this section (Ōtāhuhu Portage, 361; Papatoetoe Railway Station, 12487).

5.3.1 Papatoetoe railway bridge, 12488

This item refers to the location of the footbridge at Papatoetoe Railway Station. A request for the provision of the overhead footbridge was made in 1913. The bridge was demolished and replaced with a modern concrete overbridge between 2001 and 2006. This site will not be affected by the proposed works.

5.3.2 WWII Cambria Park military base, 15944 and 17015

These two items both refer to the US military temporary camp at Cambria Park which existed between 1942 and 1945. The close proximity of Puhinui Station allowed ease of troop and equipment movement for the camp. The camp is recorded in the CHI on the western side of the Puhinui interchange (CHI item 17015), but this location is incorrect, and the marker on Puhinui Road (CHI item 15944) represents the entrance to the camp off Puhinui Road. The indicative extent of the camp is based on aerial photography from 1939 (Figure 7).

As a post-1900 site, this site is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 but may be subject to additional controls by Auckland Council if affected by works. It is unlikely, but possible, that any earthworks taking place on the western edge of the railway corridor could encounter material related to the camp, particularly where the proposed potential land takes intersect this area.

5.3.3 Puhinui Station, 19381

Puhinui Station was established in 1923, originally with a small station building, platform, foot-bridge, siding, goods shed and loading bank. As a post-1900 site, this site is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014. This site should be outside the scope of works.

5.3.4 Otahuhu signal box, 19382

The Otahuhu signal box at the Otahuhu station was originally constructed in 1913 but has been significantly altered since. As a post-1900 site, this site is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 but may be subject to additional controls by Auckland Council if affected by works. This site should not be affected by proposed works.

5.3.5 Wiri Railway Station, 19383

Wiri Station was originally built in 1913 to serve as access for the quarry workers, rather than for general passengers. The 1913 station has no platform and was built directly into the ground, and is the only station in the railway corridor to be constructed in this way. A shelter and platform accessed from Wiri Station Road were later built south of the original station but closed in 2005. As a post-1900 site, this site is not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014. This site should not be affected by works.

5.3.6 Railway cottages, 20003, 20004, 20005, 20006, 20007, 20008, 20009 and 20010

These residences are prefabricated cottages from the late 1920s for railway workers, with one potential worker hut (20010). They are within an Auckland Special Character Area and may be subject to the proposed Kiwirail land take. Further assessment by a built heritage specialist may be required.

5.4 Summary

Overall, the majority of sites and heritage items identified through the desktop assessment of the Westfield Junction to Wiri Station section are outside the scope of works. There is a small likelihood that archaeological evidence related to Mutukaroa Pā (R11/42) could be encountered if earthworks are undertaken in their vicinity. In general, the intensity of settlement in the Ōtāhuhu area means that there is a small possibility for evidence of pre-European Māori settlement to be encountered where earthworks are taking place.

In addition to this, works will be taking place within the Papatoetoe Railway Station (CHI 12487) historic heritage extent of place (01473), though works should not affect the station building itself. CHI items 15944 and 17015, referring to the WW11 Cambria Park military base, are also in the immediate vicinity of the railway and there is a small possibility that material could be encountered if earthworks are undertaken on the western side of the railway corridor in this location. However, as a 20th century site these items are not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014. The items may be subject to additional controls by Auckland Council if they are to be affected by works. Finally, the prefabricated railway cottages (20003–20010) scheduled in the CHI are within a proposed potential land take area and may be affected by works. These cottages are within an Auckland Special Character Area and while not automatically protected by the provisions of the Heritage New Zealand Pouhere Taonga Act 2014 may be subject to additional controls by Auckland Council.

In addition to this, sections of this railway line were originally constructed in the 19th century. It is not known whether original features remain or not, but any original 19th century constructions would constitute archaeological sites and be protected under the provisions of the Heritage New Zealand Pouhere Taonga Act (2014).

6 Assessment

The following assessments of archaeological and heritage value are made under two sets of criteria: pre-1900 archaeological sites are assessed under the Heritage New Zealand Pouhere Taonga Act 2014 while 20th century sites scheduled in the AUP or recorded in the CHI are assessed under the criteria in Chapter D17 of the AUP.

6.1 Assessment under the HNZPTA

The following assessment of values and significance relate only to archaeological values. Other interested parties, in particular mana whenua, may hold different values regarding the site. The following assessment of archaeological values is based on the criteria set out in the HNZPT (2019).

6.1.1 Mataherehere Pā, R11/84

Condition	This pā is in poor condition but in situ subsurface material may still be present.
Rarity	Pā sites are a moderately common site type regionally and nationally.
Context	Pā sites should be considered as having very high contextual values, as they pertain to the wider archaeological context in the area and can be used as indicators of where larger scale archaeological landscapes may exist.
Information	Pā can provide information about the subsistence, resource and dietary patterns, function and the distribution of activities of pre-European Maori populations, along with horticultural distribution in the area. If charcoal or other datable material is found within a secure context within the scope of the pa, they could provide temporal information about the use of features. These sites have the potential for high information values.
Amenity	The area around this site is easily accessible by public (Dove Myer Robinson Park) and could be interpreted with the aid of signage.
Cultural	Cultural values can only be assessed by mana whenua.

6.1.2 Pit/terrace (Mutukaroa Pā), R11/142

Condition	Surface features at this site were in very good condition as of 2010.
Rarity	Pits/terraces and pā sites are moderately common site types regionally and nationally.
Context	This should be considered as having very high contextual values, as it pertains to the wider archaeological context in the area and can be used as indicators of where larger scale archaeological landscapes may exist.
Information	The features identified at this site, including evidence of pits, terraces, midden, hangi, houses, and artefacts, can provide information about the subsistence, resource and dietary patterns, function and the distribution of activities of pre-European Maori populations, along with horticultural distribution in the area. If charcoal or other datable material is found within a secure context within the scope of the pa, they could provide temporal information about the use of features. This site has the potential for high information values.
Amenity	This site is easily accessible by public as the majority of it is a recreation reserve. Features could be easily interpreted with the aid of signage.
Cultural	Cultural values can only be assessed by mana whenua.

6.2 Assessment under AUP Chapter D17

The following assessment of values follows the Auckland Council Methodology for Evaluating Historic Heritage Significance (2019). The main values as stated in the unitary plan for this historic heritage extent of place are its Historical, Social, Physical Attributes, Aesthetic, and Context values. These are described below.

6.2.1 Papatoetoe Railway Station, Scheduled item 01473

Papatoetoe Railway Station is scheduled as a Category A* historic heritage place (item 01473) in the Auckland Council Unitary Plan. The station is also recorded in the CHI as item 12487.

Historical	Papatoetoe Railway Station is an important part of Auckland's rail history. It was originally built in 1875 between May and August. It was a booking station with a resident porter in charge and operated as the first Papatoetoe Post Office from 1879. Changes to the Papatoetoe Station were made from 1914, with the island station formally reopening in 1919.
Social	Papatoetoe Railway Station is held in high esteem by the community for its historic, symbolic, and traditional value. The construction of the station guided the formation of the Papatoetoe community and remains a marker of the history in this area.
Physical	Original components of Papatoetoe Railway Station are representative examples of a fourth-class Vogel Station, with modifications in the early 1900s conforming to Troup Period architecture. Papatoetoe Station remains a representative example of the Troup Island Station.
Aesthetic	Papatoetoe Railway Station is distinctive for its aesthetic qualities as a restored Troup Era island station. The aesthetic qualities of the structure serve as a symbolic reminder of railway heritage and history in Auckland.
Context	Papatoetoe Railway Station contributes to the wider historical context of Papatoetoe. The station served as a central zone for the growing township in the late 1800s and early 1900s and remains an important part of Papatoetoe's history.

6.2.2 WW II Cambria Park military base, CHI 15944 and 17015

Historical	The military base is part of WWII history in New Zealand, as a US military temporary camp between 1942 and 1945. This site has moderate historical value.
Social	The majority of this site is not visible to the public, apart from a commemorative plaque. This site has little social value.
Mana whenua Knowledge	Only mana whenua can comment on the value of the site to them. There is likely little physical evidence remaining as this would have been a relatively ephemeral site and has been developed since. If any intact subsurface material is present it could provide limited information regarding the use of this site. This site has little knowledge value.
Technology	There is unlikely to be any technological attributes remaining at this site. This site has no technology value.
Physical	There is unlikely to be any physical attributes remaining at this site. This site has no physical value.
Aesthetic	This site has been built over and has no physical value.
Context	This site has contextual value in terms of its place within WWII history and the history of Papatoetoe / Puhinui / Wiri area. This site has moderate context value.

This site has moderate values based on its highest values, which are its historical and context values. Retention of these values is desirable but it does not warrant any special protections and any loss of heritage values can be mitigated.

6.2.3 Railway cottages, CHI 20003, 20004, 20005, 20006, 20007, 20008, 20009 and 20010

This assessment considers the prefabricated railway cottages as a group.

Historical	The cottages are part of the 20th century railway history in this area. These sites have little historical value.
Social	There are no known social associations with these cottages. These sites have no social value.
Mana whenua Knowledge	Only mana whenua can comment on the value of the site to them. These cottages are still standing, though many have likely been modified, and would provide information regarding early to mid 20th century railway housing. These sites have moderate knowledge value.
Technology	The cottages do not demonstrate particular technical accomplishment or innovation. These sites have no technology value.
Physical	These cottages are representative examples of different prefabricated dwellings in the late 1920s. Architectural features represented include Dutch Gable roofing, with a range of stylistic influences including Japanese style roofing, a Gothic / Art Nouveau influence, and a California Bungalow design. The cottages have moderate physical value.
Aesthetic	Many of the cottages are in poor condition or have been modified. These sites have little aesthetic value.
Context	This site has contextual value in terms of its place within WWII history and the history of Papatoetoe / Puhinui / Wiri area. This site has moderate context value.

These sites have moderate values based on their highest values, which are their knowledge, physical attributes, and context values. Retention of these values is desirable but it does not warrant any special protections and any loss of heritage values can be mitigated.

6.3 Assessment of effects

A full assessment of effects can not be carried out until finalised plans are developed. At this stage, there is a possibility for archaeological sites R11/84 (Mataherehere Pā) and R11/142 (Pit/terrace / Mutukaroa Pā) to be affected by works if earthworks are carried out in their vicinity. Works in the general Ōtāhuhu area also present a small possibility that evidence related to pre-European Māori settlement could be encountered where earthworks are carried out. South of Westfield Junction, there may still be original components of the pre-1900 railway, though this was not able to be confirmed through the desktop assessment. If any original components remain, they may be affected by works.

Potential land takes near CHI items 15944 / 17015 (Cambria Park WWII military camp) and 20003–20010 (railway cottages) could also have affects on these items, though the extent of works in these locations is not yet confirmed. Works are scheduled to take place within the Papatoetoe Railway Station (12487) historic heritage extent of place (01473), but should avoid the building itself.

7 Recommendations

These recommendations are only made on the basis of the archaeological values that have been outlined above. Any other values associated with special interest groups, including tangata whenua, can only be determined by them. It is recommended that:

- a full archaeological assessment, including in depth historic research and a field assessment, is carried out for the route, including sites R11/84 and R11/142, in support of an archaeological authority application to Heritage New Zealand Pouhere Taonga;
- further historic and built heritage assessment is carried out for CHI items 12487, 15944, 17015, 20003, 20004, 20005, 20006, 20007, 20008, 20009, and 20010;
- since archaeological survey cannot always detect sites of traditional significance to Māori, or wahi tapu, the appropriate tangata whenua authorities should be consulted regarding the possible existence of such sites, and the recommendations in this report.

References

- Atkinson, N. 2010. Railways, *Te Ara – The Encyclopedia of New Zealand*. <http://www.TeAra.govt.nz/en/railways> (accessed 18 March 2020).
- Ball, A. 2009. *The Auckland to Drury Railway*. Auckland Council Libraries: Auckland.
- Bickler, S., R. Clough, B. Baquié, and B. Pick. 2013. McLaughlins Quarry, Wiri: Final report on archaeological investigations (site R11/47).
- Bickler, S., B. Baquié, R. Clough, T. Mace, D. Prince, M. Plowman, and M. Turner. 2005. Excavations at Britomart, Auckland (R11/1379). Unpublished report for Auckland City Council.
- Brown, J. and A. Brown. 2017. Historic heritage topic report: Drury structure plan. Unpublished report.
- Bulmer, S. 1983. Prehistoric Polynesian gardens at Wiri. Unpublished report.
- Bulmer, S. 1994. Maori sites in and near the Auckland Domain. Unpublished report.
- Burgess, G. and L. Knight. 2010. Pukekohe Railway Station: Heritage Assessment. Unpublished report.
- Campbell, M. and C. Ross-Shepperd 2013. Springpark, Panama Road, Otahuhu – Te Apunga o Tainui McLennan Hills: archaeological assessment. Unpublished CFG Heritage report to Redwood Group and Barker and Associates.
- Campbell, N. n.d. Auckland City Heritage Walks: Auckland's Original Shoreline. Auckland: Auckland Council.
- Clough, R. and D. Prince. 1997. Quay Park Development: Archaeological monitoring. Unpublished report.
- Clough, R. and D. Prince. 2001. Quay Street / Britomart Place / Custom Street East stormwater diversion: Archaeological monitoring. Unpublished report for Britomart Projects Group.
- Clough, R., D. Prince, and T. Mace. 2001. Old Sailors and Auckland's Graving Dock: The archaeology of the AMP waterfront tower. Unpublished report for AMP.
- Cowan, J. 1928. Romance of the rail; through the heart of New Zealand: The North Island Main Trunk Railway; A descriptive and historical story. Govt Printer: Wellington.
- Cramond, B., S. Bulmer, and K. Lilburn. 1982. Archaeological survey of the Wiri Oil Terminal Site (N42/1224). Unpublished report.
- Foster, R. 1988. Science and Research Internal Report No. 4: Archaeological survey of the remnant of Wiri Mountain (Matukutūru), Manukau City. Unpublished report for Science and Research Directorate, Department of Conservation.
- Furey, L. 1983. Excavation of N42/941: Westfield, South Auckland. Unpublished report for New Zealand Historic Places Trust.
- Furey, L. 1986. The exca Westifeld (R11/898), South Auckland. *Records of the Auckland Institute and Museum* 23: 1-24.
- Harris, J. 2011. Wiri North Quarry, Roscommon Road, proposed subdivision of Wahi Tapu land: archaeological assessment. Unpublished CFG Heritage Ltd report to Ngati Te Ata and Winstones Aggregates Ltd.
- Judge, C. and R. Clough 2018. Commercial Bay Development, Downtown Auckland: Interim archaeological monitoring report in accordance with HNZPT Authority No. 2016/80. Unpublished report for Precinct Properties Ltd.
- Kelly, L. 1940. Tamaki-Makau-Rau: Map of the Tamaki Isthmus with Maori place names.
- Larsen, B. and R. Clough. 2018. Quay Street seismic strengthening test trenching: Archaeological monitoring report, in accordance with HNZPT Authority No. 2018/639. Unpublished report for Auckland Transport.
- Lawlor, I. 1999. Mutukaroa (Hamlin's Hill): Recommendations regarding the hedgerow, stone wall and track (CHI site 11956). Unpublished report.
- McClure, M. 2007. Auckland region, *Te Ara – The Encyclopedia of New Zealand*. <http://www.TeAra.govt.nz/en/auckland-region> (accessed 22 March 2020)
- Merrifield, A. 2009. New Zealand's North Island main trunk railway: 1870-1908. *Engineering History and Heritage* 162(EH4): 207-219.
- Murdoch, Graeme. 1990. A brief history of the human occupation of The Slippery Creek catchment. Prepared for the Regional Water Board. Planning Department of the Resource Management Division, Auckland Regional Council.
- Pearce, P. and A. Walton 1983. Radiocarbon dates from Hamlins Hill (N42/137). *New Zealand Archaeological Association Newsletter*, 26(4): 276–278
- Phillips, C. 2000. Assessment of the cultural significance of European farming structures, Mutukaroa Regional Park (Hamlin's Hill), Auckland. Unpublished report.
- Rickard, V. 1985. Preliminary report Wiri excavation: Environmental and experimental section, permit no. 1985/14. Unpublished report.
- Rickard, V., D. Veart, and S. Bulmer. 1983. A review of archaeological stone structures of South Auckland. Unpublished report.

- Salmon Reed Architects Ltd. 2009. Auckland Metro Rail Network Electrification: Heritage assessment. Unpublished report for Barker and Associates.
- Sewell, B. 1992. Further excavations at the Westfield Site (R11/898), Tamaki, Auckland. Unpublished report to the Department of Conservation.
- Stone, R. 2001. From Tamaki-Makau-Rau to Auckland: A History of Auckland.
- Sullivan, A. 1974. Scoria mounds at Wiri. *New Zealand Archaeological Association Newsletters* 18: 206-207.
- Veart, D., R. Foster, and S. Bulmer. 1984. Archaeological Mapping of the Wiri Railway Site (N42/1225). Unpublished report.



Wiri to Quay Park
Stormwater Assessment for Notice of Requirement

001 | Rev A
14 July 2020

KiwiRail Holdings Limited

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
Rev A	14/07/20	Final Version	CZ, KS	KS	DD TH	TH

Distribution of copies

Revision	Issue approve	Date issued	Issued to	Comments

Wiri to Quay Park

Project No: IA233800
Document Title: Stormwater Assessment for Notice of Requirement
Document No.: 001
Revision: Rev A
Document Status: Final
Date: 14 July 2020
Client Name: KiwiRail Holdings Limited
Client No: 601001-01-INI-0002
Project Manager: Melissa Merlo
Author: Claudia Zucco, Kristin Stokes
File Name: [W2QP NoR Stormwater Assessment Report Final.docx](#)

Jacobs New Zealand Limited

1 Grey Street, Level 8
+64 04 476 4265

www.jacobs.com

© Copyright 2020 Jacobs New Zealand Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Contents

- 1. Introduction 3
- 1.1 Overview 3
- 1.2 Scope of this Report 3
- 1.3 Limitations 4
- 2. Flood Risk Assessment Methodology 5
- 2.1 Analysis of Existing Information: Auckland Council GEOMAPS 5
- 3. Existing Stormwater Management 9
- 3.1 Flood Hazards and Existing Issues 9
- 4. Proposed Stormwater Management 11
- 4.1 Design philosophy 11
- 4.1.1 Overview 11
- 4.1.2 Stormwater Discharge and Diversion 11

Appendix A. Land Requirement Flood Maps

- A.1 100 Hospital Road & 64 Rosella Road
- A.2 18R Gordon Road
- A.3 1-21R Station Road
- A.4 12 and 14 Wyllie Road
- A.5 Puhinui Station
- A.6 Cavendish Drive
- A.7 Langley Road

1. Introduction

1.1 Overview

The Wiri to Quay Park Project (the “project”) is to provide for the increased network capacity and resilience of the North Island Main Trunk Line (NIMT) between Wiri Junction and Quay Park. The project consists of four work packages:

- Package 1: *Wiri Junction* - Additional tracks and crossovers to improve the functioning of Wiri Junction.
- Package 2: *Wiri to Middlemore* - A new 3.6km section of track between Middlemore Station and Wiri Junction, as well as the upgrading of Middlemore Station. These works will increase the capacity of the NIMT and future proof Middlemore Station for 9-car services.
- Package 3: *Westfield Junction* - A new layover track on the NIMT eastern line to provide timetable flexibility to cross the Westfield Junction, as well as works within the Westfield Yard to ensure that freight operations do not foul the mainline and impact other rail services.
- Package 4: *Quay Park* - A 1 km track extension and mainline connections into the Ports of Auckland (POA) freight facility, thereby allowing for faster entry and exit into and out of the Port.

Each of these four work packages will include Outline Plans (given the presence of a designation for the NIMT) and resource consents for regional plan related matters (e.g. discharges) in the Auckland Unitary Plan (Operative in Part) (the AUP). In addition, Package 2 requires the preparation of a Notice of Requirement (NoR) given the need to incorporate additional land (not currently held by KiwiRail Limited) into the designated rail corridor.

This report provides a high-level flood hazard assessment to support the NoR for Package 2. The assessment has been undertaken using the flood maps available in the Auckland Council GEOMAPS website which have been prepared using flood models. Flood models play an important role for estimating cost of flood repairs, impact on service reliability, risk to private property and risk to public safety. Flood hazard maps produced from flood models are used for strategic planning purposes and they provide the basis for the decision making of flood risk management. For example, a culvert under the North Auckland Line (at New Lynn) failed causing a blow out and major damage to track and downstream properties that could otherwise have been avoided by implementing the appropriate mitigation measures beforehand.

1.2 Scope of this Report

The scope of this Report is to carry out a high-level flood risk assessment as required in Chapter E36 of the Auckland Unitary Plan (Operative in Part) (AUP(OP)) for the NoR for Package 2. The initial flood risk assessment is carried out using the flood information available for the project footprint. The assessment is two phased:

Phase One

Identify and assess flood risks associated with the land required for the NoR, while recognizing existing bulk stormwater infrastructure in the NIMT corridor (i.e.) Auckland Council managed culverts). This assessment will identify whether the land is suitable for inclusion from a flooding risk perspective and what, if any, mitigation is required as part of the NoR.

1.3 Limitations

The limitations of this flood assessment are:

- We have relied on the flood maps available from the Auckland Council GEOMAPS website that were produced from 2D flood models. The level of detail provided within the website is suitable for the purposes of this high-level assessment.
- The flood maps for this area are based on modelling that was carried out between 2008 and 2009. There may have been development or other changes since the modelling was done. There is a risk that overland flow volumes have changed due to trackside development, as well as further development outside the corridor. In both instances, this development has likely altered the area of impervious surfaces within affected catchments and any resultant stormwater flows.
- The available flood maps generally show flood risk areas for the 1% AEP event for current climate conditions only, although it is noted that climate change is expected to increase both the frequency and intensity of storms in Auckland.

Given these limitations, the following assessment has taken a conservative approach to potential flooding effects on surrounding properties.

2. Flood Risk Assessment Methodology

This Report identifies potential flooding issues and interfaces that might impact design development of the project.

There are three different types of flooding that were found to be applicable to the NoR land requirements properties:

- Fluvial flooding occurs when waterbodies break their banks and water flows out onto any low-lying areas (i.e. natural floodplains). This can arise when the runoff following heavy rain exceeds the natural capacity of the river channel and can be exacerbated where a channel is blocked or constrained.
- Pluvial flooding occurs when the amount of rainfall exceeds the capacity of an urban stormwater network or the ground to absorb it. This excess water flows overland, ponding in hollows, low-lying areas or behind obstructions. This occurs as a rapid response to intense rainfall, before the flood waters eventually enter a piped or natural drainage system. This type of flooding is driven by short, intense storms.
- Artificial Drainage Systems flooding occurs as a result of surcharging or blocking of drainage networks.

The climate change expected over the lifetime of the project may affect flood risk to the project. Rainfall depths and intensities are expected to increase, and mean sea level is expected to rise. These effects may increase the frequency and/or severity of flooding if no other changes in the project environment occur (e.g. improvements to flood defences and drainage systems).

2.1 Analysis of Existing Information: Auckland Council GEOMAPS

The Auckland Council GEOMAPS is a GIS Viewer developed by Auckland Council. It contains spatial and non-spatial data from across the Auckland region, including the four layers described below which have been used to inform the W2QP Flood Risk Assessment:

Flood Prone Areas

- Flood prone areas are topographical depressions. The areas occur naturally or are created by dammed gullies created by man-made features such as roads and railway embankments. The flood prone extent is the area water will pond up to in a 1% AEP¹ extreme rainfall event assuming the outlet to the topographical depression is blocked².

An example of a Flood Prone Area is shown in Figure 2-1 for clarity.

Flood Plains

- Indicates the extent predicted to be covered by flood water as result of a rainstorm event of a scale that occurs on average once every hundred years. These extents have been produced from hydraulic modelling. The floodplain layer contains the most up to date information for each of the 23 Stormwater Catchments in the Auckland region. Summary data for each catchment is attributed against each floodplain².

¹ Annual Exceedance Probability (AEP). The Probability of exceeding a given storm discharge or flood level within a period of one year. For example, a 1% AEP floodplain is the area that would be inundated in a storm event of a scale that has a 1 per cent or greater probability of occurring in one year. (Auckland Council Code of Practice for Land Development and Subdivision. Chapter 4 – Stormwater. Version 2.0, 1 November 2015)

² Definition extracted from Auckland Council GeoMaps <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

An example of Flood Plains is shown in Figure 2-2 for clarity.

Overland Flow Paths³

- Low point in terrain, excluding a permanent watercourse or intermittent river or stream, where surface runoff will flow, with an upstream contributing catchment exceeding 4,000m².

Excludes the following areas:

- Constructed depressions and pits within Special Purpose - Quarry Zone.

Note

The Council holds publicly available information showing the modelled Overland Flow Paths in its GIS viewer for specific properties. The Overland Flow Path map is indicative only. A party may provide the Council with a site-specific technical report prepared by a suitably qualified and experienced person to establish the location, depth or flow characteristics of the Overland Flow Path. Council will continually update the Overland Flow Path map to reflect the best information available.

- The Auckland Council GEOMAPS website shows the predicted path stormwater takes, as it flows downhill over the land. This layer is also classified into 3 different groups by catchment areas: 3 ha and above (thick blue line), 4000m² to 3 ha (thin blue line) and 2000m² to 4000m² (dashed blue line).

An example of Overland Flow Paths is shown in Figure 2-3 for clarity.

Underground Services – Stormwater

- Pipelines form part of a reticulated stormwater network that includes pipelines, culverts and subsoil drains to drain stormwater runoff from roads, property and open areas to receiving environments.
- The Existing Stormwater Network has been considered when assessing potential flood issues from the proposed works (i.e. backflow effects and sufficient inlet capacity).

By comparing the location of the proposed works from the Scope Definition drawings with the flood areas from the Auckland Council GEOMAPS, three land requirement locations were identified to have existing flood hazards on or adjacent to the NoR extents. A brief description of the existing flood hazards is provided in Sections 3 for each of the identified land requirement locations.

³ Definition extracted from RC3.2.18 E36 Overland Flow Paths – Auckland Design Manual

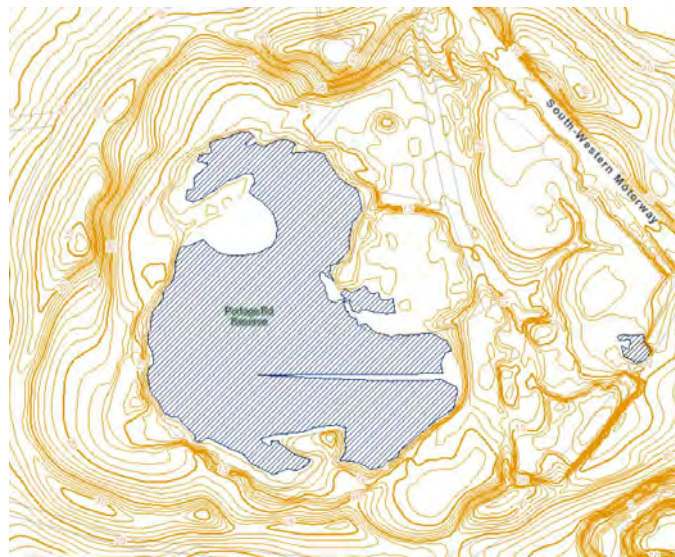


Figure 2-1: Example of Flood Prone Area shown as a dashed blue line boundary. The contour lines are shown as orange lines. It can be seen that the Flood Prone Area boundary is located in a topographical depression and it is constituted by lines of equal elevation.



Figure 2-2: Example of Flood Plain shown as a semi-transparent light blue solid boundary.



Figure 2-3: Example of Overland Flow Path shown as dashed (2000m^2 - 4000m^2), thin (4000m^2 - 3ha) and thick ($>3\text{ha}$) blue lines according to the contributing catchment area.

3. Existing Stormwater Management

3.1 Flood Hazards and Existing Issues

This Section identifies the land requirement locations and the sites external to the land take that are likely to be affected by the proposed works. Refer to Appendix A for details of the flood areas for each of the land requirement locations.

i. 100 Hospital Road and 64 Rosella Road

The flood risk in the catchment where the land takes are located is likely due to the flat topography, the urban land use and proximity to the coastal margins of the Tamaki River. Water ponds on the upstream side of the culvert under the railway line with the DN600 and DN1300 existing culverts acting as a restriction on flow during high flow events. The restriction of through flow at these culverts may be intentional to manage downstream flows. The culverts under the rail corridor DN600 and DN1300 are council assets with a deed of grant in place. They are linked to a council owned open channel in the rail corridor which also has a grant in place. There is a risk that the deed of grants that cover this area may limit the changes that can be made and will necessitate engagement with the council as asset owner. The land takes at 64 Rosella Road and 100 Hospital Road are located within a flood prone area.

The proposed works will cause a change in soil permeability and a displacement of flood volume which may cause changes to the flow paths. The flood volume displacement from the proposed works at the abovementioned land takes could increase the flood extent area and the flood depth at 60-62 Rosella Road and possibly cause backwater effects upstream of the existing DN600 culvert crossing Rosella Road, thus affecting the properties at 39-47 Rosella Road. In addition, the proposed extension of the two existing culverts crossing the railway line will potentially make the culverts less hydraulically efficient, thus, increasing the upstream headwater levels. However, further, more detailed assessment is required to confirm the likelihood and magnitude of the flooding effects to the sites external to the land take.

Mitigation measures will be provided to avoid significant impacts to the surrounding residential and commercial developments and ensure that any flooding effects of the works are less than minor.

ii. 18R Gordon Road

The temporary land take at 18R Gordon Road is expected to have less than minor flooding effects, although this is dependent on the scale and nature of the proposed temporary works. The site is to be used for construction access and as a site yard. While construction access works are not expected to cause significant change of flood levels at 18R Gordon Road and the surrounding properties, if the site yard occupies a significant part of the site footprint then mitigation will be provided to ensure that flooding is not increased off-site.

iii. Station Road and Wylie Road

The permanent land requirements at Station Road and Wylie Road were assessed and determined to have nil to less than minor flooding effects. We do not expect the works to increase flood levels. Furthermore, the properties are currently not flooded, and the land takes are at least 1m above the flood levels.

iv. Puhinui Station

The permanent land take and the construction access road at Puhinui Station shown in Appendix A.5 were determined to have less than minor flooding effects. The proposed construction access is not expected to cause significant change of flood levels at the surrounding properties. However, localized flood volume displacements

are likely to happen due to changes in soil permeability throughout the reserve. Mitigation measures will need to be provided if significant earthworks are to be undertaken within the land take to ensure that flood levels are not increased at the surrounding properties.

v. Cavendish Drive

The land take at 212 Cavendish Drive for construction access utilizes an existing road as shown in Appendix A.6 and is expected to have nil flooding effects, as no earthworks or modifications of soil permeability are proposed.

vi. Southwest Motorway

The additional designation area under the SH20 is expected to have nil flooding effects as no earthworks or modifications of soil permeability are proposed at this location.

vii. Langley Road

The construction access through the existing car park between the properties at 12 Langley Road and 24-44 Langley Road shown in Appendix A.7 is expected to have nil flooding effects as no earthworks or modification of soil permeability are proposed at this location.

4. Proposed Stormwater Management

This Section summarizes the proposed stormwater management approach for the project at the affected land requirement locations described in Section 3.1.

4.1 Design philosophy

4.1.1 Overview

The construction of the Project will alter the hydrological flows that have potential to impact the receiving environments.

The design objectives for stormwater management and stormwater infrastructure design are as follows:

- To attenuate stormwater flows and not exacerbate existing flooding issues through efficient road drainage, preservation of existing overland flowpaths, and runoff volume detention where possible.
- To minimise the effects of stormwater discharges on the receiving environments from any newly formed impermeable surfaces.
- Ensure stream outfalls and culverts do not cause erosion and are designed using green infrastructure principles.
- To provide a sustainable and resilient stormwater system that will incorporate the effects of climate change.

4.1.2 Stormwater Discharge and Diversion

Following the identification of the flooding issues in Section 3.1, hydrological mitigation is recommended for the works on 64 Rosella Road and 100 Hospital Road as the project's detailed design is undertaken. As such, three flood mitigation approaches could be considered:

- Appropriate hydraulic design of the extension of the two existing culverts DN600 and DN1300 under the rail corridor at the north end of 100 Hospital Road to reduce impacts on upstream headwater level. If the flood volume displacement caused by the proposed works at 64 Rosella Road and 100 Hospital Road are deemed to be significant to the land takes and the surrounding properties, the design should seek to compensate for the displaced volume to reduce effects. Extended detention and flood mitigation structures such as a wetland pond may be suitable.

Maintenance of existing overland flowpaths as much as possible. For the temporary land take at 18R Gordon Road if the site yard is expected to occupy a significant proportion of the property with temporary buildings or other works that are determined to displace flood volume then mitigation measures should be considered:

- Compensation for displaced volume
- Maintenance of existing overland flowpaths as much as possible.

Appendix A. Land Requirement Flood Maps

A.1 100 Hospital Road & 64 Rosella Road



A.2 18R Gordon Road



A.3 1-21R Station Road



A.4 12 and 14 Wyllie Road



A.5 Puhinui Station



A.6 Cavendish Drive



A.7 Langley Road

