



**Western
Bay of Plenty**
District Council



7 HADEN PLACE CENTRAL

LIM

Land Information Memorandum

Information in a LIM

Includes:

Rates and water rates

- Current Rating Valuation
- Annual Rates
- Outstanding Rates amounts
- Water Charges

Sewer and stormwater

- Whether the property has district sewer available and whether it is connected

Special land features

- Including potential erosion, filling, flooding avulsion, falling debris, slippage, alluvion, or inundation.
- The status of the land in relation to the contamination of soil by hazardous substances
- Weathertight Homes information (if relevant)
- Any relevant reports or information held by council in relation to the property

Archaeological sites

- Any relevant Archaeological sites.

Building consents, licences and requisitions

- Building Permits/Consents issued on the property
- Any outstanding works, Code Compliance Certificates for consents issued since 1993
- If a Compliance Schedule has been issued for the building and when the related Warrant of Fitness expires

Licences and environmental health

- Whether the property has a licence relating to the sale of food, the sale of liquor or any other licence (under Health Act 1956)

Enforcements and notices

- Any notice, order, or requisition affecting the land or any building on the land previously issued by Council

Planning and resource management

- Zoning of the property as defined by Operative and/or Proposed District Plans
- All Resource Consents approved in relation to the property
- Long term Community Plans
- Structure Plans

Drainage and water

- Information on public stormwater and wastewater pipelines on the property as shown on Councils log plans
- Water toby location

Maps

- Maps relating to the property including Aerial Photo, Land Information, District Plan and Deposited Plan.

Information not received in a LIM:

- Building Plans
- For information in relation to State Highways please contact Waka Kotahi NZ Transport Agency
- Western Bay of Plenty District Council does not hold any information concerning electricity, gas and telephone connections.
- Computer Registers (previously called Certificate of Title).

Land Information Memorandum

Section 44a, Local Government Official Information and Meetings Act 1987

30 July 2025

P/1964/4

BOWKER, ALYSON LOUISE
7 HADEN PLACE
OMOKOROA 3114

Kia orā

Thank you for your application for a Land Information Memorandum.

The original of this LIM has been prepared pursuant to S.44A of the Local Government Official Information and Meetings Act 1987, solely for the applicant, and contains information known to Council within its records and only relevant to the site requested. The reliance by other parties on the information within this LIM shall be at that other parties' sole risk. If any interpretation or explanation is required on any of the enclosed information or plans, the services of an independent advisor or consultant should be sought.

It is recommended that the Record of Title, which is not issued by Council, be searched by the purchaser. The LIM does not necessarily include information relating to private covenants or other memoranda affecting the title and those should be obtained from a Land Record search.

In preparing this report, no Council inspection of the property has been undertaken.

This Land Information Memorandum is valid as at the date of issue only.

Ngā mihi

The Consents Services Team (Environmental Consents)

limprocessors@westernbay.govt.nz

Applicant

Client Name:

Applicant Name: BOWKER, ALYSON LOUISE
7 HADEN PLACE
OMOKOROA 3114

Postal Address: 7 HADEN PLACE
OMOKOROA 3114

Application Date: 28 Jul 2025

Issue Date: 30 July 2025

Property

Property Owner: BOWKER, SIMON NICHOLAS
BOWKER, ALYSON LOUISE

Valuation No: 06882 004 20

Location: 7 HADEN PLACE CENTRAL

Legal Description: LOT 104 DP 381050

Area (hectares): 0.0806

Copies of any relevant deposited plans are included in the Map Section of this LIM.

Rates and Water Rates

The information provided on rates/financial details in this report may not reflect the current details of the legal description/valuation on your application form. This may be due to the property being under subdivision or that the information has not yet been provided or updated for the current valuation and improvements for this financial year.

Note: Rates, Rateable Valuation Details and Water Rates relate to a valuation number. This may be linked to other properties, or a parent property. For this Land Information Memorandum, the valuation number 06882 004 20 is linked to LOT 104 DP 381050 BLK IV TAURANGA SD

Land Value:	\$520,000
Improvements:	\$610,000
Capital Value:	\$1,130,000
Tree Value:	\$0

Annual Rates:	\$4,783.04
Rates Owing:	\$2,391.54

Note: For the period until rates are "set" the Current Annual Rates and Rateable Valuation Details should not be relied upon and any queries should be directed to the Rates Team.

Rates are charged in two equal instalments for the period commencing 1 July and ending 30 June each year.

Water Rates – This information applies to Western Bay of Plenty District Council systems only. In some parts of Tauriko, Papamoa, Pyes Pa and Oropi, properties are served by Tauranga City Council system.

Metered Water	YES
Date of Last Reading	18 Mar 2025
Connected	YES
Available	YES
Owing	\$0.00

Water rates may be outstanding on this property as meter readings are completed six monthly.



Further information about Council's water supply and water quality is available from Council's website. Please refer to the Western Bay of Plenty District Council's Water Supply System Bylaw 2008: [Water Supply System Bylaw 2008](#)



Rates information and valuation history can be found online at the Western Bay of Plenty District Council website: [Rating Information Search](#)



For any information regarding Maori Land, please contact the Waiariki or Waikato/Maniapoto Office of the Maori Land Court or view their website and online records at: [Maori Land Court](#)

Building

This information is a record of details held on Council files and may not reflect the situation on site if work has been undertaken without consent. If Council holds any as-built drainage plans relevant to this property they will be included in the attachments section of this LIM.

Building Consents:		
BC	Project	Status of Consent
79696	DWELLING	CCC FINAL ISSUED 12 Nov 2009

Building, Plumbing and Drainage Permits issued prior to 1993 will not have a Code Compliance Certificate as the requirement for this did not come into effect until 1 January 1993.

Any information held by council relating to Building Permits will be listed on the Historical Data page at the back of this section in your LIM.

Information regarding buildings where Council holds no records of consents:

The absence of records for building permits or consents may mean any of the following:

- The building was erected without a permit or consent.
- The building work may be exempt from requiring a permit/consent.
- A Council record is unable to be located.

If building work was carried out without a building permit prior to the 1991 Building Act, or without obtaining building consent under the Building Act 1991 or Building Act 2004, then there is no authority under those Acts for the Council to retrospectively issue a building consent for the work.

For buildings erected prior to the commencement of the Building Act 1991, without any building permit or for which Council holds no records, then Council is generally unlikely to take any action against the current owners of that building unless the building is unsafe or insanitary in terms of the Building Act 2004 or the Health Act 1956. This assumes that the building complies in all other respects with other statutory requirements.

For post-Building Act 1991/Building Act 2004 work, for which the Council holds no record, or the work is not exempt, it is likely that the building work was carried out without consent. If so, the property owner and the person who carried out the work may have contravened the Building Act 1991 and Building Act 2004, and enforcement action may be taken at the Council's discretion. However, some building work is exempt from requiring a permit/consent. This generally applies to small buildings or structures and minor alterations. Irrespective of whether consent is required the Building Act requires that all building work must comply with the Building Code. Potential purchasers of properties requiring further information on building work are advised to engage a qualified building professional to inspect and report.

A certificate of acceptance can be applied for when work is done without a building consent after 1 July 1992, or in specific circumstances when a code compliance certificate (CCC) can't be issued.

For further information go to – [Certificate of Acceptance Information](#)

Certificate of Acceptance:	
COA	Status
None Known	

Compliance Schedules / Building Warrant of Fitness:	
Premise	Notes
None Known	

Any other information affecting this Property is listed below:
-COUNCIL SERVICES There are Council Services on this property (refer to the Land Information Map in the Map Section of this LIM). It is Council policy that no building shall be built closer than the greater of: a. 1.5m from the centre of any public sewer, stormwater or water pipe. b. within 1.5m of rising main c. the depth of the pipe inverted from the ground surface. To construct a building within these requirements written permission must be granted by Councils Utilities Manager.

Environmental Health – Registrations and Licences

Premise Registration:		
Premises	Category	Licence Status
None Known		

Liquor Licences:			
Type	Status	Licence No	Date Issued
None Known			

Enforcements and Notices

Enforcements and Notices:				
Parcel ID	Notice Type	Comments	Date Issued	Date Complied
None Known				

Special Land Features

This section includes any special features of the property known to Council including potential erosion, fill, flooding, avulsion, falling debris, slippage, alluvium or inundation. It also includes the status of the land in relation to the contamination of soil by hazardous substances.

It is the landowner's responsibility to determine whether the property is suitable for any proposed activity or whether any proposed building site is suitable for development (and to undertake tests if necessary).

Any information relating to Weathertight Homes Resolution Services Act 2006 – Section 124 will be included in the attachments section of this LIM (if applicable).

Any relevant reports held by Council are included in the attachments.

Natural Hazards

Our region is exposed to a range of natural hazards including earthquakes, coastal erosion, volcanic eruption, landslides, tsunamis and flooding.

These natural hazards can have major consequences on people, property and infrastructure. Regional Council is working to improve our understanding and management of these risks to support safe and resilient communities. Further information regarding Natural Hazards Specific to this property can be found here;

[Bay of Plenty Regional Council Website – Natural Hazards](#)

[Bay Hazards – Bay of Plenty Natural Hazards Viewer](#)

Further property specific Natural Hazard information can also be found under the 'Planning/ Resource Management' section of this LIM (inside the Operative District Plan 'identified features' and the 'other features' boxes).

Contaminated Land

Information about [Contaminated Land](#) can be found on the Bay of Plenty Regional Council's (BOPRC's) website.

Properties that are currently recorded on the BOPRC Land Use Register can be viewed via the BOPRC's [HAIL Site Viewer](#).

If the property is identified as a HAIL site, the BOPRC's land use register letter and/or land use site details will be included in the 'attachments section' of this LIM.

Any contaminated site investigations and/or site validation reports will also be included in the 'Attachments' section of this LIM (if available for this property).

Historic Heritage Features and Archaeological Sites

Please refer to the map section of this LIM. The Geographic Information Services (GIS) plan entitled 'Archaeological Sites' will identify any registered archaeological site(s) over the property (depicted as a "U" number in a red/pink box/circle). If a site(s) is recorded on the property, an 'archaeological sites report' will be attached.

Please also refer to the District Plan map, this will also identify any significant historic heritage features located on the property. If a significant historic heritage feature is recorded over the property, the provisions of Section 7 (Historic Heritage) of the Operative District Plan apply.

If the GIS plan or District Plan map does not identify any archaeological site(s) and/or historic heritage feature(s) it should not be assumed there are no sites or features, only that Council has no record of these. Property owners still have obligations under the Heritage New Zealand Pouhere Taonga Act 2014 in that it is an offence for anyone to destroy, damage or modify or cause to be destroyed, damaged or modified, the whole or part of any archaeological site, knowing or having reasonable cause to suspect it is an archaeological site.



Further information on Archaeological Sites and/or Historic Heritage Features in the Western Bay of Plenty District can be found here;

- [Operative District Plan](#)
- [NZAA Arch Site Hub](#)
- [Heritage New Zealand](#)

Sewer and Stormwater

Services: See attached Land Information map

District Sewer Connected: YES

District Sewer Available: YES

If a sewer is available, under the Local Government Act 1974, the property must connect to the sewer if it is within 30 metres of the property boundary or if the sewer is within 60 metres of the dwelling.

Septic Tanks and On-Site Effluent Treatment Systems (OSET)

Most septic tanks in the Western Bay of Plenty are permitted provided they are adequately maintained, however, when making dwelling additions you may need to upgrade the wastewater system, and this will require Building Consent under the Building Act 1991.

The removal and/or upgrade of existing septic tanks and/or OSET may also require Resource Consent from the Bay of Plenty Regional Council. Please contact Bay of Plenty Regional Council directly 0800 884 880 if you have any further questions about this.

OSET Maintenance Zones

In some areas where the environment is being adversely affected, the Bay of Plenty Regional Council has decided to include communities in maintenance zones. This requires more active management of systems to reduce the risk to the environment and to public health. Within the Western Bay of Plenty District, **Tanners Point** is located within one of these maintenance zones. A map showing the extent of this zone can be found in the On-Site Effluent Treatment Regional Plan:

[OSET Regional Plan](#)

Please note, Ongare Point and Te Puna West are now reticulated and are therefore no longer considered as maintenance zones.

If the land is located within the Tanners Point maintenance zone, you will need to employ a contractor to pump out and inspect the septic tank. A report on the size and condition of the system is prepared by the contractor. Any repairs that are required are the responsibility of the owner.

Please contact Bay of Plenty Regional Council directly 0800 884 880 if you have any further questions about this.

Network Utility Operators

Western Bay of Plenty District Council does not hold any information concerning electricity, telecommunication and gas connections. Information may be obtained from the relevant network utility providers.

Projects

We work to provide good-quality local infrastructure and local services to our communities. You can read about [Council Projects](#) here.

Planning/Resource Management

This property is zoned **MEDRES** for more information on this zone refer to the [Western Bay of Plenty Operative District Plan](#)

The District Plan including rules, maps and performance standards, plus any current (and previous) Plan Changes can be found here:



[Operative District Plan](#)

[District Plan Changes](#)

If you have any questions about the Operative District Plan, please contact Council's Customer Service Planner.

RC Number	Status	Consent Type	Date Issued
	None Known		-

Any information held by council relating to Historic Planning Consents will be listed on the Historical Data page at the back of this LIM.

If there are any Consent Notices, Memorandums of Encumbrance, Deeds of Covenant, Bush Protection Inspections and/or Yard Exemption Statements relevant to this property they will be included in the attachments section of this LIM.

Resource consents can lapse. Applicants are advised to verify the status of Resource Consents with Council staff.

If a Resource Consent(s) has been granted on this property it does not infer that the conditions of the consent have been met. Applicants are advised to verify the status of Resource Consent(s) with Council's Customer Service Planner.

Any features identified in the Operative District Plan are listed below:

Any other features are listed below:
-LIQUEFACTION Council holds a report from Tonkin + Taylor Ltd entitled "Bay of Plenty Regional Liquefaction Vulnerability Assessment" (2021) (Report). This Report presents the results of a liquefaction mapping exercise for the Bay of Plenty Region. Liquefaction can occur when some saturated soils (typically silts and sands) lose strength and stiffness (temporarily behaving as a liquid rather than a solid) in response to earthquake shaking. The Report was prepared in accordance with the Ministry for the Environment (MfE) and Ministry of Business, Innovation and Employment (MBIE) "Planning and Engineering Guidance for Potentially Liquefaction Prone Land" (2017) to a Level A (basic desktop assessment) level of detail. A figure showing the liquefaction vulnerability categories recommended for use in the "Planning and Engineering Guidance for Potentially Liquefaction Prone Land" (2017) can be viewed on Council's natural hazards webpage (liquefaction subpage). These categories are "liquefaction damage is unlikely", "liquefaction damage is possible" and "liquefaction category is undetermined". The Report is referred to in this LIM because the subject property is identified based on information contained in the Report as having one or more of these categories. The liquefaction maps from the Report are shown on the map contained in this LIM entitled "Natural Hazards (Not District Plan)" and shown on Council's interactive online natural hazard map. The latter allows a particular property to be searched for and can be viewed on Council's natural hazards webpage (liquefaction subpage). "Liquefaction damage is unlikely" means a probability of more than 85 percent that liquefaction-induced ground damage will be none to minor in a 1-in-500 year earthquake shaking event. At this stage there is not enough information to distinguish between Very Low and Low (liquefaction vulnerability). More detailed assessment would be required to assign a more specific liquefaction category. Following more detailed assessment a classification of Medium or High (liquefaction vulnerability) is also a possible categorisation but based on the information available this is considered very unlikely.

"Liquefaction damage is possible" means a probability of more than 15 percent that liquefaction-induced ground damage will be minor to moderate (or more) in a 1-in-500 year earthquake shaking event. At this stage there is not enough information to distinguish between Medium and High (liquefaction vulnerability). More detailed assessment would be required to assign a more specific liquefaction category. Following more detailed assessment a classification of Very Low or Low (liquefaction vulnerability) is also a possible categorisation but this is considered less likely.

"Liquefaction category is undetermined" means that a liquefaction vulnerability category is undetermined, either because a liquefaction assessment has not been undertaken for this area, or there is not enough information to determine the appropriate category with the required level of confidence.

Council will be introducing changes to its District Plan in due course to update its maps to reflect the information contained in the Report. In the interim, Council will be relying on the information contained in the Report to exercise statutory functions such as making decisions under the Building Act and Resource Management Act.

The Report can be viewed on Council's natural hazards webpage (liquefaction subpage). The Report includes a liquefaction vulnerability map for the Region in Figure 4.2 on page 52.

This liquefaction subpage also contains information and Frequently Asked Questions (FAQs) relating to liquefaction and how it may affect the use of a property.

It can be viewed at www.westernbay.govt.nz/liquefaction.

Property Adjoining Reserves

Under Council's Reserve Management Plan(s) any property adjoining a public reserve is not permitted to encroach onto that reserve. Where new encroachments occur, or if an existing encroachment exists, Council will give notice to the encroacher to remove the encroachment and reinstate the reserve at their own cost. Please refer to the Reserve Management Plan.



[Reserve Management Plans](#)

Community Plans

Council has a programme to help urban communities in the district develop long term plans that detail a vision for each community. Information regarding current Community Plans can be found here:



[Community Plans](#)

Other Useful information

Western Bay of Plenty District Council provides the following discretionary information which it considers to be relevant in accordance with Section 44A(3) of the Local Government Official Information and Meetings Act 1987 (LGOIMA).

Structure Plans

Structure plans have been created by Council to assist in managing the District's growth. These identify new areas for development and show required infrastructure (roading, water supply, wastewater disposal, stormwater and recreation) and associated costs. These structure plans are contained in [District Plan – Appendix 7 – Structure Plans](#) and shown on the Planning Maps.

Council Website

The Council's [Website](#) provides comprehensive information and resources, including details on building and resource consents topics such as natural hazards and zoning.

The Bay of Plenty Regional Council

Regional Council policies and plans may affect the use and management of land, water air and other natural and physical resources. These can be found here: [Bay of Plenty Regional Council Website](#)

For further information on whether a property is affected by any Regional Planning instrument or by some other function of the Regional Council please contact Regional Council.

The Ministry for the Environment

The Ministry for the Environment administer Acts, National Policy Statements, National Environmental Standards and other regulations. See [Act and Regulations](#).

HISTORICAL DATA

There are no historical planning consent documents held for this property

There are no historical planning consent documents held for this property

MAPS

Aerial Photography

Land Information

Land Information Legend

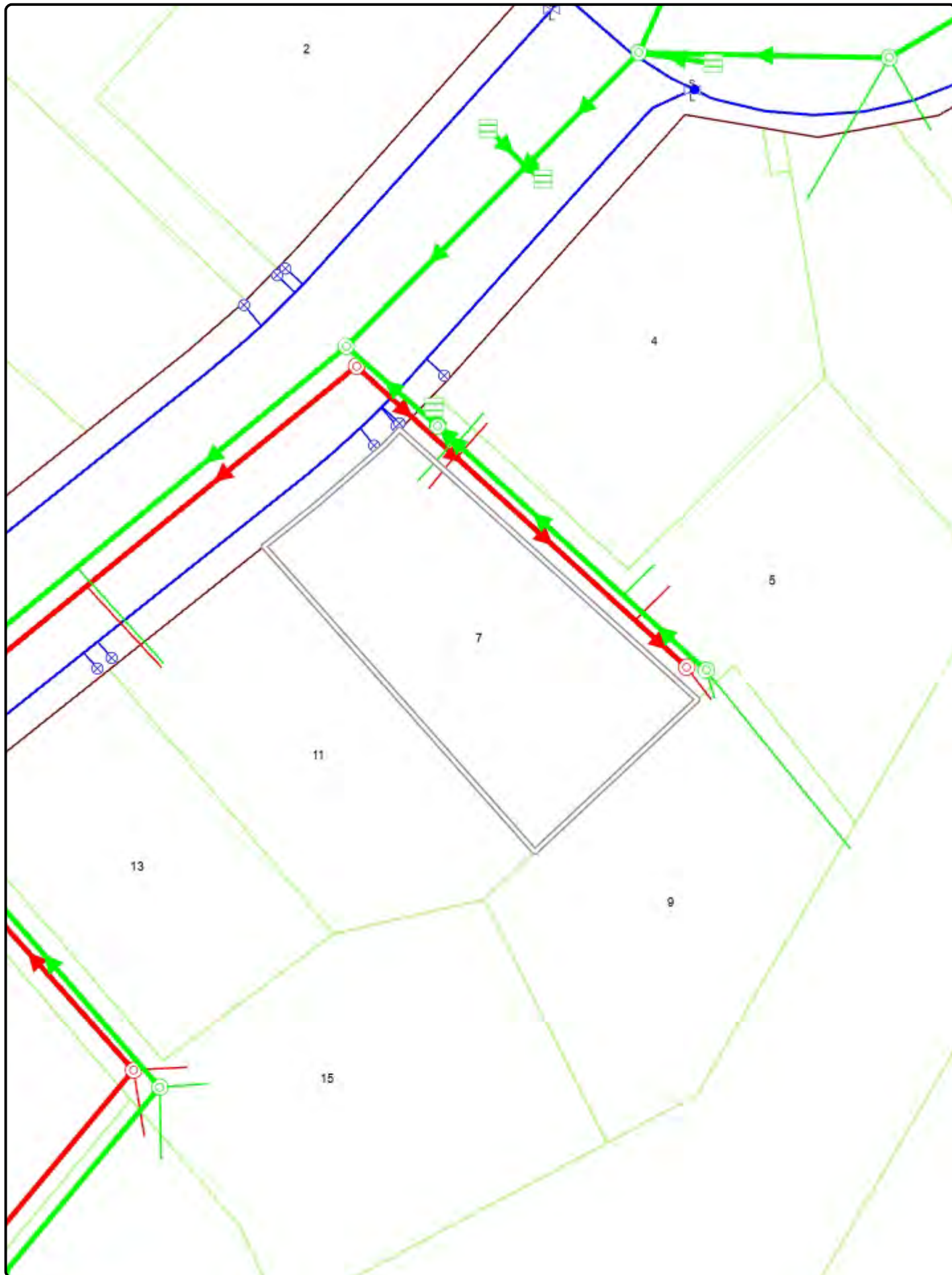
District Plan

District Plan Legend

Other Natural Hazards (not in District Plan)

Natural Hazards Legend





Water Supply		Main	Wastewater		Gravity Main
		Rider Main / Connection			Gravity Main (Below 1:2000)
		Instruments - Meter / Toby			Rising Main
		Valve - Air Release			Service Main / Connection
		Valve - Altitude			Chamber - Inspection Shaft
		Valve - Non Return / Backflow Preventer			Chamber - Manhole
		Valve - Butterfly			Mechanical - Grinder Pump
		Valve - Flow Control			Valve - Air / AirKnife
		Valve - Flow Meter			Valve - Non Return
		Valve - Hydrant			Valve - Pressure Reducing
		Valve - Normally Closed			Valve - Scour /Knife
		Valve - Pressure Reducing			Valve - Sluice
		Valve - Pressure Sustaining			Inlet
		Valve - Scour			Treatment Plant
		Valve - Sluice			Junction
	End Cap		Outlet		
	Junction		Instruments - Flow Meter		
	Treatment Plant		Pump		
	Containment Structure - Reservoir or Tank		Wastewater Pond		
	Pump		Paper Road		
	Well - Bore		Property or Restrictive Area		
Stormwater		Gravity Main	Property		Building
		Gravity Main (Below 1:2000)			Hydro
		Pressure Main			Railway
		Service Main / Connection			Road
		Open Drain			Parcel
		Grass Swale			TCC Water Catchment
		Catchpit			Statutory Acknowledgement Areas
		Chamber - Box			Consent Notice Covenant
		Chamber - Inspection Shaft			Ecological
		Chamber - Manhole			Conservation Covenant
		Soakhole			QE II
		Valve - Flood Gate			Class 1
		Valve - Sluice			Class 2
		Wing Wall			Class 3
		Inlet			Other Councils
	Junction		Western Bay of Plenty		
	Outlet		Ocean, River, Stream		
	Pump		Selected Parcel		
	RAMM Culvert				
	Stormwater Drainage Reserve				
	Stormwater Pond				

Crown Copyright Reserved.
LINZ Digital Licence No. HN/352200/03 & TD093522.
Archaeological data supplied by NZ Historic Places Trust
<http://www.archsite.org.nz>

Location of Services is indicative only.
Council accepts no liability for any error.



Western
Bay of Plenty
District Council

For our
people

Land Information Legend





**Western
Bay of Plenty**
District Council

**For our
people**

District Plan Legend



Other Natural Hazards

-  Coastal Erosion Year 2080
-  Coastal Erosion Year 2130
-  Tauranga Harbour Coastal Inundation
-  Katikati Floodable Area
-  Te Puke Floodable Area
-  Waihi Beach Floodable Area
-  Wairoa Floodable Area
-  Rural / Small Settlements Floodable Area
-  Maketu/Pukehina Tsunami
-  Liquefaction Damage is Possible
-  Liquefaction Damage is Unlikely
-  Liquefaction Category is Undetermined

Property

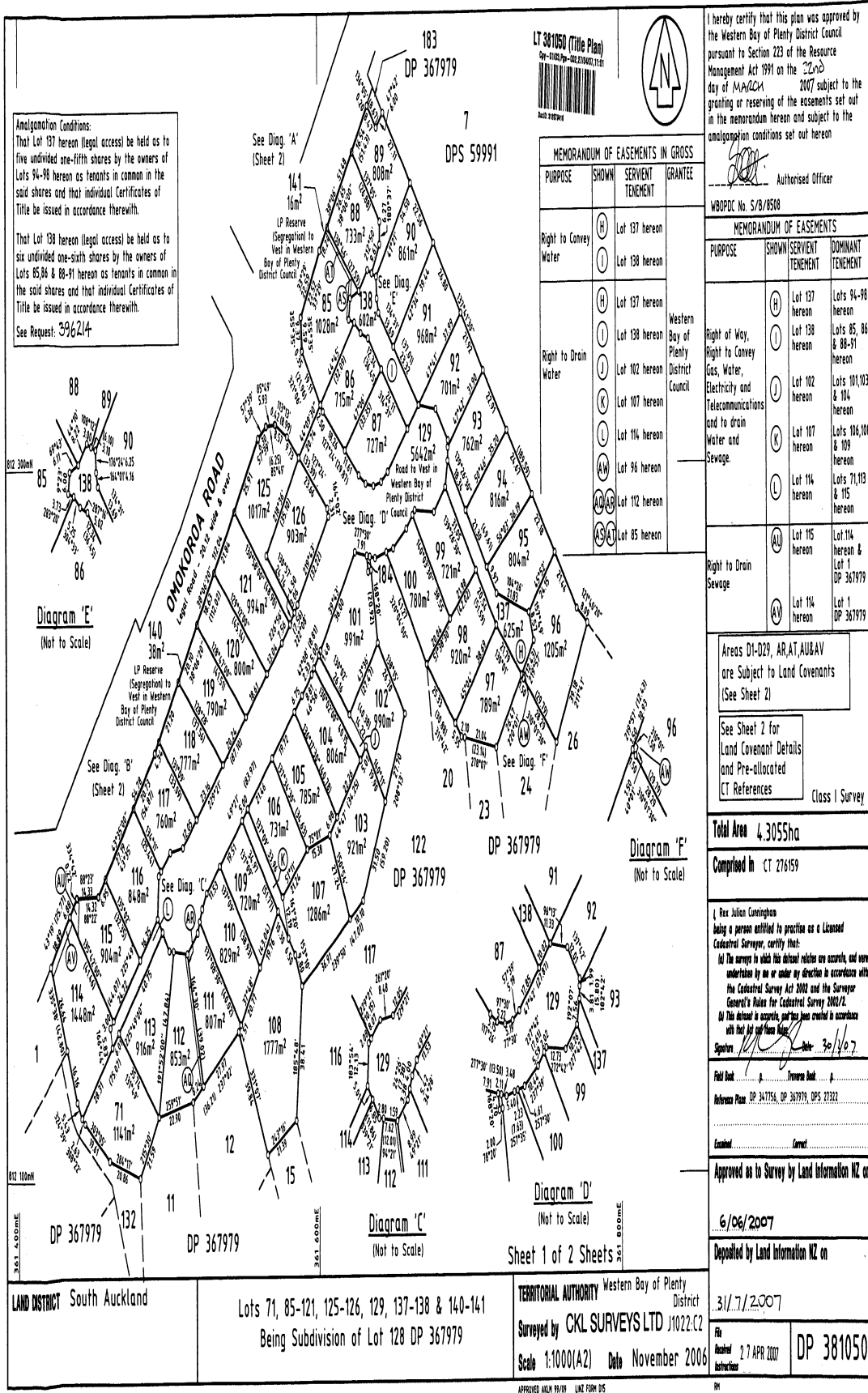
-  Paper Road
-  Property or Restrictive Area
-  Building
-  Lease
-  Hydro
-  Railway
-  Road
-  Parcel
-  Selected Parcel



Western
Bay of Plenty
District Council

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people

Natural Hazards Legend



Amalgamation Conditions:
That Lot 137 hereon (legal access) be held as to five undivided one-fifth shares by the owners of Lots 94-98 hereon as tenants in common in the said shares and that individual Certificates of Title be issued in accordance therewith.
That Lot 138 hereon (legal access) be held as to six undivided one-sixth shares by the owners of Lots 85, 86 & 88-91 hereon as tenants in common in the said shares and that individual Certificates of Title be issued in accordance therewith.
See Request: 396214



I hereby certify that this plan was approved by the Western Bay of Plenty District Council pursuant to Section 223 of the Resource Management Act 1991 on the 22nd day of MAY 2007 subject to the granting or reserving of the easements set out in the memorandum hereon and subject to the amalgamation conditions set out hereon

Authorised Officer

MEMORANDUM OF EASEMENTS IN GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
Right to Convey Water	(H)	Lot 137 hereon	Western Bay of Plenty District Council
	(I)	Lot 138 hereon	
Right to Drain Water	(H)	Lot 137 hereon	
	(I)	Lot 138 hereon	
	(J)	Lot 102 hereon	
	(K)	Lot 107 hereon	
	(L)	Lot 114 hereon	
	(AM)	Lot 96 hereon	
	(AU)	Lot 112 hereon	
	(AV)	Lot 85 hereon	

MEMORANDUM OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT	Dominant Tenement
Right of Way, Right to Convey Gas, Water, Electricity and Telecommunications and to drain Water and Sewage.	(H)	Lot 137 hereon	Lots 94-98 hereon
	(I)	Lot 138 hereon	Lots 85, 86 & 88-91 hereon
	(J)	Lot 102 hereon	Lots 101, 103 & 104 hereon
	(K)	Lot 107 hereon	Lots 106, 108 & 109 hereon
	(L)	Lot 114 hereon	Lots 111, 113 & 115 hereon
	(AU)	Lot 112 hereon	Lot 114 hereon & Lot 1 DP 367979
Right to Drain Sewage	(AV)	Lot 114 hereon	Lot 1 DP 367979
	(AV)	Lot 114 hereon	Lot 1 DP 367979

Areas D1-D29, AR, AT, AU & AV are Subject to Land Covenants (See Sheet 2)

See Sheet 2 for Land Covenant Details and Pre-allocated CT References
Class 1 Survey

Total Area 4.3055ha

Comprised in CT 276159

I, Rex J. Cunningham being a person entitled to practice as a Licensed Cadastral Surveyor, certify that:
a) The survey in which this document 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 2002/2.
b) This document is a copy, and has been created in accordance with that Act and these Rules.
Signed: [Signature] Date: 30/10/07

Field Book: [Blank] Reference Book: [Blank]

Reference Plan: DP 347754, DP 367979, DP 27322

Examined: [Blank] Correct: [Blank]

Approved as to Survey by Land Information NZ on

6/06/2007

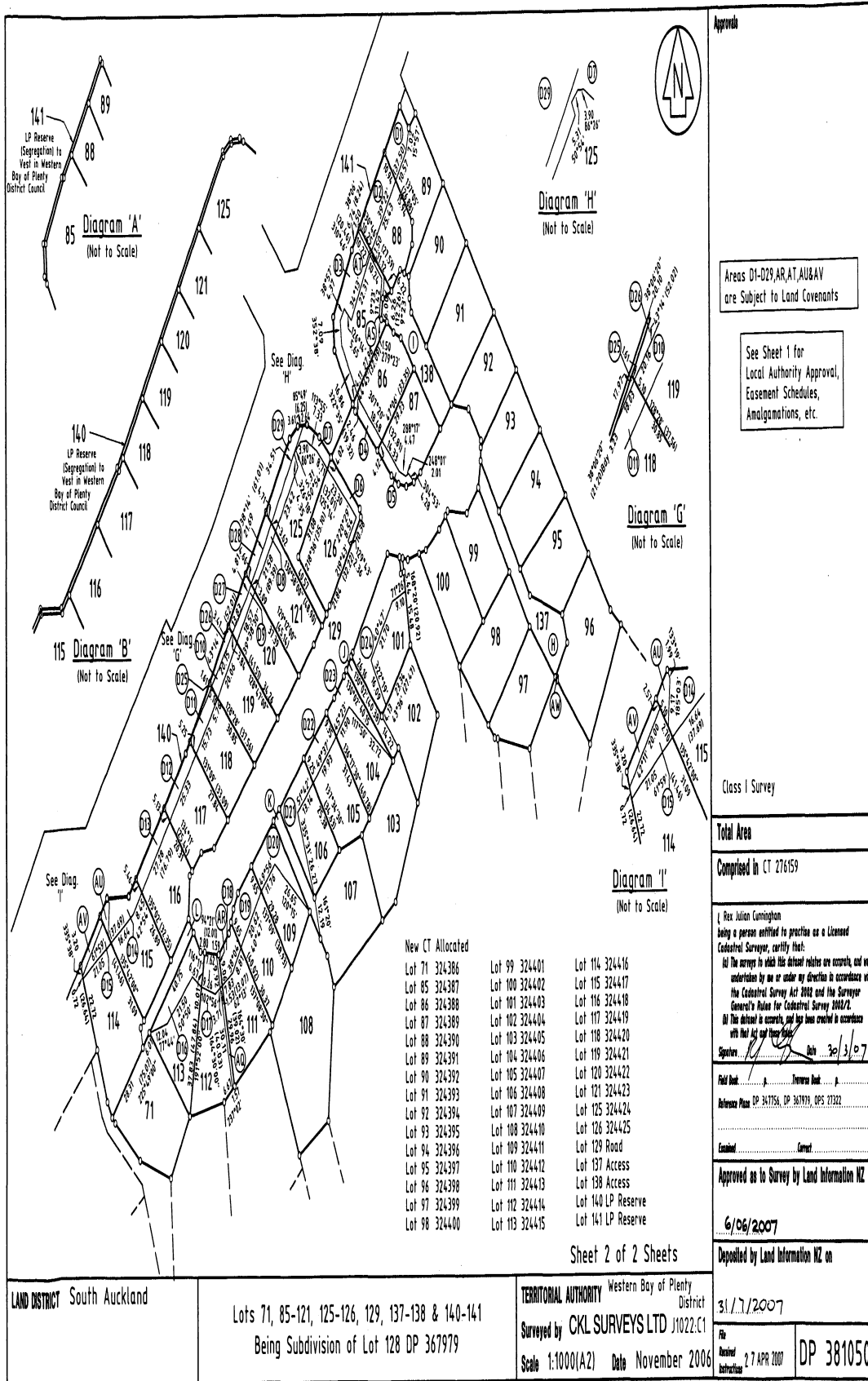
Deposited by Land Information NZ on

31/7/2007

File Number: 27 APR 2007

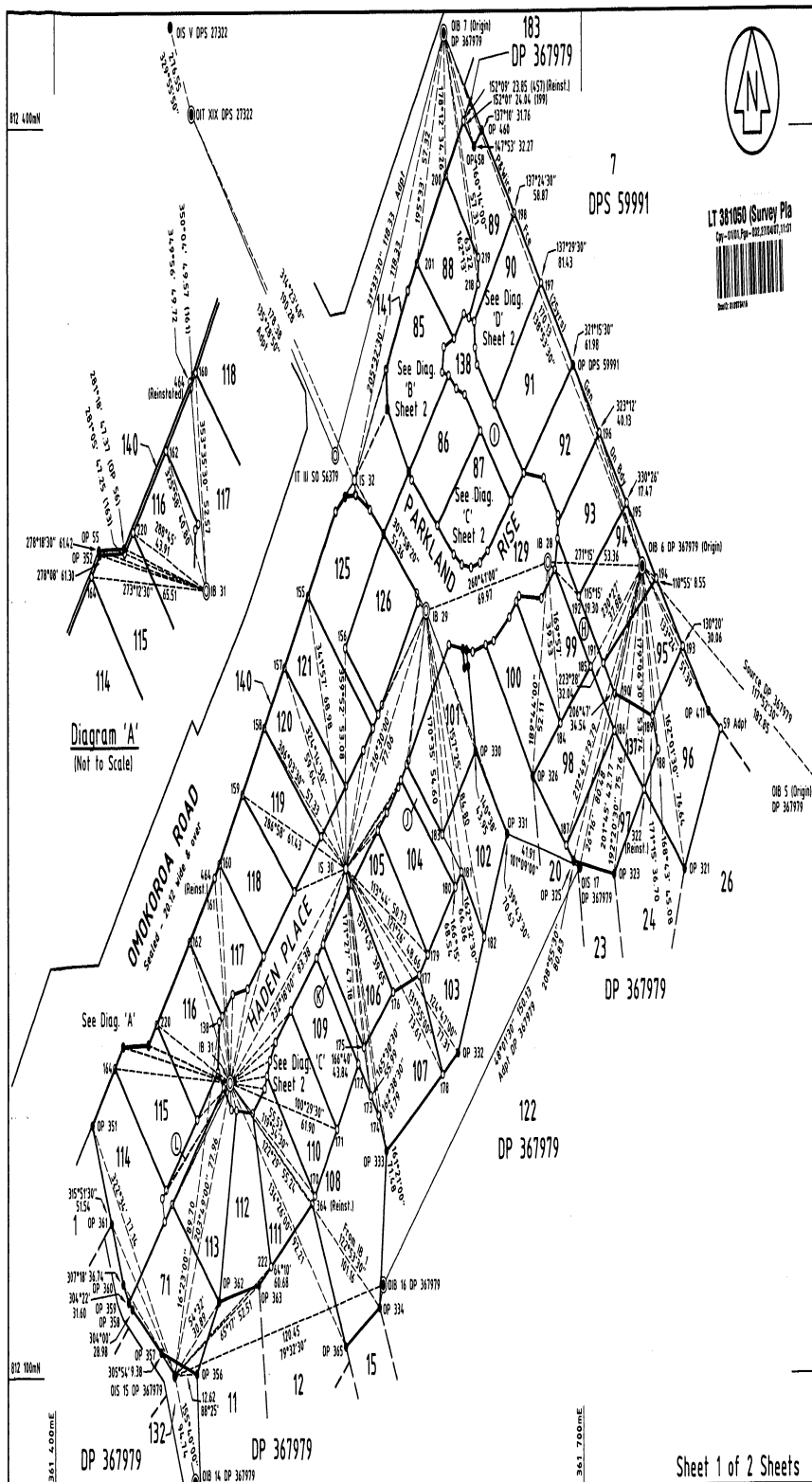
DP 381050

LAND DISTRICT South Auckland	Lots 71, 85-121, 125-126, 129, 137-138 & 140-141 Being Subdivision of Lot 128 DP 367979	TERRITORIAL AUTHORITY Western Bay of Plenty District Surveyed by CKL SURVEYS LTD 11022.C2 Scale 1:1000(A2) Date November 2006	DP 381050
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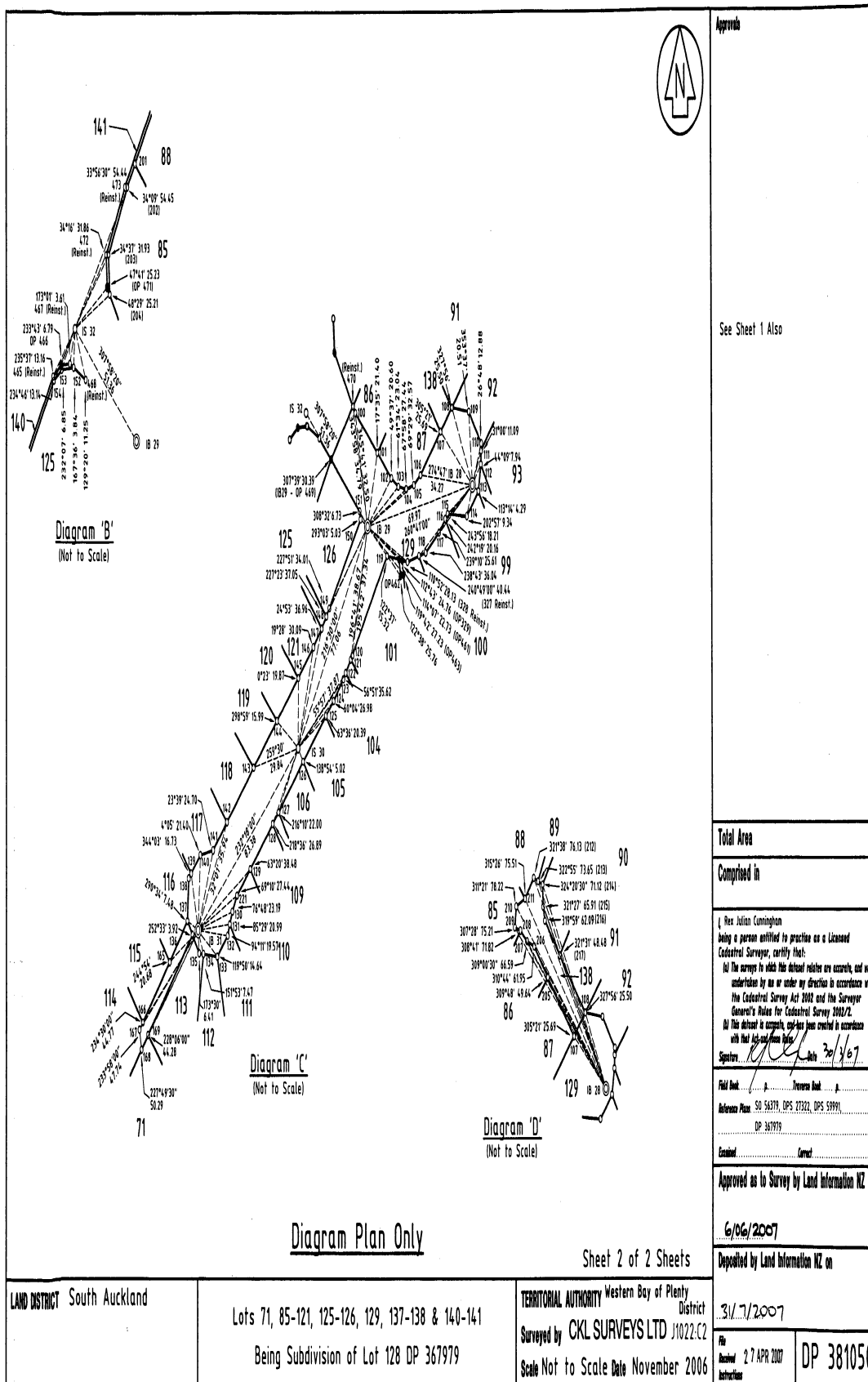
LAND DISTRICT South Auckland	Lots 71, 85-121, 125-126, 129, 137-138 & 140-141 Being Subdivision of Lot 128 DP 367979	TERRITORIAL AUTHORITY Western Bay of Plenty District Surveyed by CKL SURVEYS LTD J1022.C1 Scale 1:1000(A2) Date November 2006
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Sheet 2 of 2 Sheets



Approval GEODETIC DATUM 2000 MERIDIONAL CURVATURE: BAY OF PLENTY 2000 FALSE ORIGIN: 800 000 mN 400 000 mE Origin of Coordinates OIB & DP 367979 (Landonline) 812294.64mN 361733.87mE	
NOTES: 1. Equipment used: Sokkia PowerSet 3000 NO.15745 & Leica TCR705 No.456366 2. New boundaries are not fenced unless shown otherwise. 3. Field work by Clive Robinson, Graduate Surveyor 4. For traverse and pegging ties not shown on this plan, see Sheet 2. 5. All old marks are adopted from DP 367979 unless otherwise shown. 6. All reinstated pegs are from DP 367979	
CLASS I SURVEY	
Total Area	
Comprised in	
I, Rex Julian Cunningham being a person entitled to practice as a Licensed Cadastral Surveyor, certify that: (a) The survey in which this deed relates are correct, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor General's Rules for Cadastral Survey 2002/2. (b) This deed is correct, and has been created in accordance with that Act and those Rules.	
Signature: <i>[Signature]</i>	Date: 30/1/07
Field Book: <i>[Blank]</i>	Traverse Book: <i>[Blank]</i>
Reference Plan: SO 56379, DPS 27322, DPS 59991, DP 367979	Examined: <i>[Blank]</i> Correct: <i>[Blank]</i>
Approved as to Survey by Land Information NZ on	
6/06/2007	
Deposited by Land Information NZ on	
31/7/2007	
File Number: 317 APR 2007	DP 381050

LAND DISTRICT South Auckland	Lots 71, 85-121, 125-126, 129, 137-138 & 140-141 Being Subdivision of Lot 128 DP 367979	TERRITORIAL AUTHORITY Western Bay of Plenty District Surveyed by CKL SURVEYS LTD J1022.C2 Scale 1:1000 Date November 2006
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Attachments

A2020287: 221 Consent Notice

A4386719: BC79696 - As Built Drainage Plan

A884187: Lynley Park Subdivision Ground Contamination Desk Study Investigation
Invoice



Western Bay of Plenty
District Council

No: 30421

**Consent Notice Pursuant to Section 221
Resource Management Act 1991**

File Ref: S/B/8508
STAGE 1B

IN THE MATTER OF: Deposited Plan 381050

A N D

IN THE MATTER OF: Subdivision Consent pursuant to
Sections 108, 220 and 221 of the
Resource Management Act 1991.

PURSUANT to Section 252(1)(a) of the Local Government Act 1974, I, CHRIS WATT, Authorised Officer of the Western Bay of Plenty District Council, hereby certify that by way of resolution passed under delegated authority on 10th March 2006, the following condition was imposed on the subdivision consent for part Allotments 52, 52A, 53, 53A, 54, 54A, 55, 91A Part Lot 6 DP 12835, Part Land DP 3254 Te Puna Parish

A4.8 THAT a consent notice pursuant to Section 221 of the Resource Management Act 1991 be issued against the titles of all lots adjoining Council reserves to the effect that the construction of the fences on the common boundary are at the expense of the respective landowners or occupiers.

Explanatory Note: This Condition applies to those lots adjoining Lots 140 and 141 on DP 381050.

A10.4 THAT a consent notice pursuant to Section 221 of the Resource Management Act 1991 be issued against the titles of allotments that are subject to building restriction line or any other geotechnical constraints. Those allotments [Lots 85, 86, 87, 88, 89, 101, 104, 105, 106, 109, 110, 111 – 121, 125 and 126], shall be specified in the Geotechnical completion report to be attached to this Consent Notice

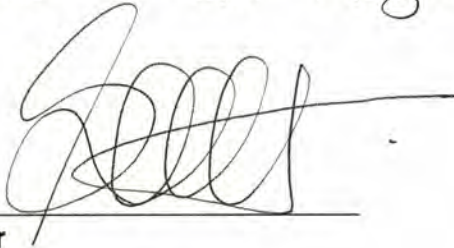
[Explanatory Note: This condition applies to those parts of the Lots listed in the Condition that are identified with a letter on Sheet 2 of 2 on DP 381050. For the avoidance of doubt the relevant areas on each lot are: Lots 85(D3), 86(D4), 87(D5), 88(D2), 89(D1), 101(D24), 104(D23), 105(D22), 106(D21), 109(D20), 110(D19), 111(D18), 112(D17), 113(D16), 114(D15 and AV), 115(D14 and AU), 116(D13), 117(D12), 118(D11), 119(D10 and D26), 120(D9 and D27), 121(D8 and D28), 125(D7 and D29) and 126(D6)]

A19 Development and use of residential lots

THAT a building line restriction (or similar mechanism to the satisfaction of the Principal Administration Officer) be imposed on Lots 118, 119, 120, 121 and 125 so as to provide a minimum 30 meter separation distance between dwellings on those lots and properties on the north-western side of Omokoroa road opposite the subject site. This condition shall be registered as a consent notice against the certificates of title of all the affected lots.

[Explanatory Note: This condition applies to those parts of the Lots listed in the Condition that are identified with a letter on Sheet 2 of 2 on DP 381050. For the avoidance of doubt the relevant areas on each Lot are: Lots 118(D25), 119(D26), 120(D27), 121(D28) and 125(D29)]

Dated at Tauranga this 17th day of August 2007

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke at the end, positioned above a horizontal line.

Authorised Officer

REPORT

DURHAM PROPERTIES LTD

Lynley Park Subdivision, Omokoroa
Stage 1b - Geotechnical
Completion Report

Report prepared for:
DURHAM PROPERTIES LTD

Report prepared by:
TONKIN & TAYLOR LTD

Distribution:
DURHAM PROPERTIES LTD
TONKIN & TAYLOR LTD (FILE)

5 copies

1 copy

April 2007

Job no: 60619

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1. Introduction

Tonkin & Taylor Ltd was engaged by Durham Properties Ltd to review Stage 1b earthworks for the Lynley Park subdivision at Omokoroa. Stage 1b of this subdivision includes development of 40 residential lots (being lot 71, lots 85 to 121 inclusive, lot 125 and 126. Lot 122 is a reserve).

The work undertaken by Tonkin and Taylor comprised:

- An inspection of the site and the surrounding area by a senior geotechnical engineer prior to commencement of works;
- Design investigations, analysis and reporting;
- Regular site visits by engineering staff to observe the cut-to-fill earthworks. Field density testing of the compacted fill was carried out by the contractor using a nuclear densometer along with shear vane testing of soils for strength;

The above work has been carried out to support the attached "Statement of Professional Opinion as to the Suitability of Land for Building Development" (Appendix A).

This engagement was specific to earthworks and geotechnical matter only on this development. Overall completion reporting for the development is reported elsewhere by CKL Ltd. This report does not include certification of retaining walls on the site. This is to be provided by others.

2. Available Site Data

Several geotechnical reports have been prepared for the subdivision area. These have included factual reporting of geotechnical investigation data and design recommendations. The applicable reports are as follows;

Reference Report 1

"Geotechnical Investigation Report on Lynley Park residential subdivision at Omokoroa Road, Omokoroa Peninsula", report prepared by Foundation Engineering Ltd for Durham Property Investments Ltd, dated the 16th of December 1999, project number 8425.

Reference Report 2

"Supplementary Geotechnical Investigation Report on Lynley Park residential subdivision Stage 1 at Omokoroa Road, Omokoroa", report prepared by Foundation Engineering Ltd for Durham Property Investments Ltd, dated the 15th of April 2002, project number 8425.

Reference Report 3

"Durham Investment Properties Ltd – Stage 1, Lynley Park Omokoroa Geotechnical Issues Report", prepared by Tonkin & Taylor Ltd and dated March 2004.



Reference Report 4

"Durham Investment Properties Ltd -Lynley Park Subdivision Omokoroa, Tauranga Geotechnical Geotechnical Investigations for Northern Boundary", prepared by Tonkin & Taylor Ltd and dated January 2004.

This report must be read in conjunction with the data included in these reports. We note that design concepts for the works have changed since preparation of the reports by Foundation Engineering. Because of this the Foundation Engineering reports may be considered to be a source of factual data only.

Design details of the overall development are included in completion reporting by CKL Ltd.

Copies of all of these reports were included with completion reporting for Stage 1a of this subdivision.

3. Site Conditions

3.1. Development Details

Stage 1b is accessed along Omokoroa Road with the general layout of this stage being shown on the drawing T&T Figure 1 in Appendix B. This is the second separable portion of the works.

Design details of the overall development are included in completion reporting by CKL Ltd.

3.2. Site Description

The original site topography was dominated by a north-east to south-west trending ridge and gully which run parallel to each other towards the coastal flank of the site. The top of the ridge has a predominantly gentle rolling slope towards the north-east of the block, however the sidling slopes grade sharply down a moderate to steep (25 to 40°) slope to the north-east and south-east of the ridge and down less inclined, moderately steep (15 to 20°) slope to the north-west to Omokoroa Road below.

Much the current geomorphology of the site, particularly on the north-eastern and south-eastern flanks of the ridge, can be attributed to landslipping, the mechanism of which will be discussed in the following sections.

A localised gully feature was located alongside Omokoroa Road and in the centre of the current area to be certified.

3.3. Geological Setting

The geological strata forming the Omokoroa Peninsula and underlying the majority of the site can be broadly divided into three main units that overlie the ignimbrite basement, which is inferred to underlie the basin into which these units were deposited.

The older of the three units is known as the Matua Subgroup, an assemblage of terrestrial and estuarine sediments and interbedded ashes that formed within an ancient river/estuary system. Sedimentary deposits comprise well sorted gravel

and sand deposits, carbonaceous silts and muds together with peat horizons. Many of these deposits are inter-fingered with volcanic breccias and ashes derived from Rotorua – Taupo volcanism.

Directly overlying these is the deeply weathered clay-rich Hamilton Ash, which blankets much of the Waikato and northern Bay of Plenty Region.

The Rotoehu Ash and other young less weathered ashes constitute the youngest unit. These comprise a sequence of young rhyolitic air fall ashes between 2 and 4m thick that covers much of the Omokoroa Peninsula.

This data was based on information available from published geological maps of the area (IGNS 1:50,000 series) and the Tonkin & Taylor geotechnical database. Construction works on site have confirmed this inferred geology.

A detailed description of the geological model, engineering design and recommendations is included in Reference Report 3.

4. Summary of Design Recommendations

4.1. Introduction

This section is intended to provide the design recommendations contained in Reference Report 3. Any detailed assessment will require reference to that report.

4.2. Slope Stability

As highlighted in previous sections of this report there was geomorphic evidence of past instability within the site, in particular within the south-eastern sidling slope and the north-eastern point of the main ridge. Analysis indicates that ridge slopes originally existed with a factor of safety between 1.5 and 2.5 which is considered 'stable' for slopes under long term static conditions. Analysis also shows that earthworks should generally improve the long term FOS under drained slope conditions. However, a reduction in the FOS for slopes results from pore water pressure increases within the underlying Pahoia Tephra layer when modelling both existing and post-earthwork conditions.

Building restriction lines have been defined along the Omokoroa Road frontage slope to ensure that building platforms are located away from these slopes. Lines have also been defined to ensure appropriate separation from other minor batter slope and also the retaining walls constructed on site.

These lines may all be considered to define zones where building construction will require specific engineering design and do not indicate a complete prohibition on development.

The lines are shown on the figures in Appendix B.

4.3. Maximum Cut Depth

The subsurface profile established for the site indicated that the main ridge area is mantled by between 3 to 6m of unweathered to slightly weathered sandy and silty ash overlying up to 5m thick silt (Pahoia Ash). Laboratory results and field observations showed that the Pahoia Ash is highly sensitive to disturbance and has

a high water content well in excess of optimum and close to or above its liquid limit. In considering these two properties of the Pahoia Ash it was considered unlikely that this material could be practically utilised for engineered fill since handling the material will encounter great difficulties due to drying times and traffickability of cut surfaces.

The overlying ash units have lower moisture contents and lower sensitivity and would be, subject to conditioning, ideal for the use as engineered fill. However to satisfy the site requirements for NZS3604:1999 *Timber Framed Structures* we recommended that a minimum of 1.5m of the upper Ash material remain over the underlying highly sensitive Ash. Final cut levels were based on this recommendation.

The north-western ridge, which extends from the south-western end of the main ridge towards Omokoroa Road, was lowered up to 7.0m to establish the main access road into the area. Sections within this area have also been recontoured to slope northwards. To achieve this, localised cuts have extended into the underlying sensitive soils. For localised cuts extending below the stiff ash profile, undercutting of the underlying softer soil was undertaken and desired ground levels established with a minimum of 1.5m of engineered fill

4.4. Fill Suitability

The earthworks operation involved up to 4.5m of cut from the main ridge on site and subsequent filling of the northern low lying area. Other cut and fill operations involved the lowering of the north-western ridge to provide an accessway to the development. The soils encountered were generally expected to comprise clayey silts, sandy silts and pumiceous silty sands. These materials should, with appropriate conditioning, be suitable for handling and compaction by conventional earthmoving plant.

Where localised undercutting of soft ground has taken place the cut material often had high moisture contents and was either spread to be dried (if to be used for fill) or cut to waste.

An earthworks specification was prepared for the cut and fill operation undertaken on-site. This is included in Appendix D.

4.5. Preparation of Fill Areas

Subsurface investigations undertaken within the proposed fill areas indicated the presence of either soft compressible soil or colluvial debris derived from landslipping in the area. The fill subgrade was inspected and approved by the Engineer following the stripping of topsoil from the fill area and prior to placement of fill. Any identified unsuitable material was undercut and disposed of to an approved disposal area.

Earthworks was carried out in accordance with NZS 4404:1981 *Code of practice for Urban Land Subdivision*, including benching of slopes prior to the placement and compaction of fill. This should ensure that the fill is keyed into the underlying natural ground.

4.6. Fill Induced Settlement

The majority of the fill has taken place in the main depression that runs between the main ridge and Omokoroa Road, in which up to 10m of engineered fill was placed. Due to the depth of the fill in this area it is expected that there will be some fill induced settlement. The majority of the settlement is expected to have occurred relatively rapidly. Due to the length of time since placement of the fill, residual settlements within building platforms are expected to be minimal.

5. Construction

The earthworks were carried out by A&R Earthmovers Ltd in 2004 to 2006, with final cut-fill contours shown on the attached plan T&T Figure 1. The bulk of the filling in deep fill areas was completed in 2004-2005. The cut-fill contours show the maximum depth of cut or fill from final ground contours. The earthworks included the following:

- i. Topsoil stripping and removal of unsuitable organic material from existing ground and surplus quantities removed off site.
- ii. Cutting high ridge areas to reduce ground height and provide fill materials. This included undercutting in areas where filling was required over sensitive soils.
- iii. Placement of on site fill to contours as shown on the final fill plan.
- iv. Road excavation and services installation.
- v. Construction of retaining walls adjacent to Road 4.
- vi. Topsoil replaced over the proposed lots to a maximum depth of 300mm.

Fill was placed in accordance with the project earthworks specification, which complies with the Western Bay of Plenty District Council (WBoPDC) requirements for subdivisional earthworks. Compaction of the fill in open areas was carried out by trafficking of a fully laden scraper in a systematic manner over the fill areas or using a sheeps foot roller where further compactive effort was required to meet the specification.

Tests were carried out by the Contractor as the earthworks progressed and on completion of the earthworks, indicating various passing and failing tests as summarised in Appendix C. The fill was removed in the areas found to be failing, replaced in layers, conditioned and recompacted. All failing areas were subsequently retested.

The as-built drawings attached in Figure 1, Appendix B, show the extent of cut and fill for the earthworks. A maximum cut depth of 3.0m is shown in Lot 71. The areas of maximum fill, up to 10.0m depth, were located in Lot 116.

A producer statement construction (PS3) has been supplied by the Contractor and is included in Appendix A.

Construction observation did not include observation of the retaining walls constructed on site.

6. Field Testing

6.1. Inspections

Regular engineering inspections were carried out during the earthworks to confirm that organic and unsuitable material were identified and removed before filling commenced.

6.2. Fill Testing

Fill control was undertaken using shear strength and maximum air voids ratios to confirm adequacy of compaction. The following criteria are taken from the earthworks specification that is included in Appendix D.

TABLE 1 : Compaction Testing

Test	Method	Notes
Vane Shear	NZ Geotechnical Society Guidelines for Hand-held Shear Vane (2002)	The result shall be taken as the mean of at least 4 No. readings within a area of $\geq 0.5\text{m}^2$, located within representative zones of the material being tested.
Water Content	NZS4402	
Dry Density	NZS4402	
Air Voids	NZS4402	
Solid Density	NZS4402	1 test per material type, subject to Geotechnical Engineer's written approval, and provided the nature of the fill remains consistent.
Notes: Additional tests should be carried out if the nature of the fill changes, or at the direction of the Engineer. Tests shall be accordance with NZS4402 <i>Methods of Testing Soils for Civil Engineering Purposes</i> , as appropriate.		

TABLE 2 : Fill Testing Requirements

Fill Type	Test	Min. frequency	Criteria
Structural Fill more than 1.0 m below finished level	Water Content	1 per 2,000 m ³	Minimum = 35 % Maximum = 60 %
	Air Voids	1 per 2,000 m ³	Maximum = 10.0 %
	Undrained Shear Strength	1 per 500 m ³ , reducible to 1 per 1000 m ³	Average result ≥ 115 kPa Any single reading ≥ 110 kPa
Structural Fill less than 1.0 m below finished level	Water Content	1 per 2,000 m ³	Minimum = 35 % Maximum = 60 %
	Air Voids	1 per 1,000 m ³ 1 per 1,000 m ² for filling less than <500 mm thick	Maximum = 8.0 %
	Undrained Shear Strength	1 per 500 m ³	Average result ≥ 125 kPa Any single reading ≥ 115 kPa
Non-structural Fill	Air Voids	1 per 3,000 m ³ provided <1000 mm lifts	Maximum = 14 %
	Undrained Shear Strength	1 per 1,000 m ³ , reducible to 1 per 2000 m ³	Average result ≥ 60 kPa Any single reading ≥ 60 kPa

Notes:

The frequency of testing will depend on the consistency of fill operations and materials used, and may be varied by the Engineer to obtain sufficient spatial coverage through the depth and extent of the filling.

Additional tests should be carried out if the nature of the fill changes, or at the direction of the Engineer.

The Engineer and Contractor shall continue to monitor earthworks operations. Once materials are consistent and work is being carried out in a systematic and consistent manner, the Engineer may vary the frequency of testing.

Earthworks testing results are included in Appendix C.

7. Suitability for Development

7.1. General Observations

Based on our site observations, the method of fill placement, and the results of compaction control tests carried out during earthworks, we are of the opinion that the developed lots (being Lots 71, 85 to 121, 125 and 126) of Stage 1b of the Lynley Park Subdivision, are generally suitable for residential development in accordance with NZS 3604:1999 "Timber Framed Buildings". Some specific locations will require additional consideration and are described in Section 7.2.

All foundations should be founded in competent fill and/or natural ground below the topsoil layer. Settlement of buildings constructed in accordance with NZS 3604:1999 is expected to be less than 20 mm. Due to the presence of sensitive soils on the site it is necessary for foundations in natural soils to be inspected by a suitably qualified professional to ensure that there are no specific hazards at the foundation locations. If sensitive soils are encountered then some alterations will be required to foundation construction.

For buildings which do not meet the requirements of NZS 3604:1999, we recommend a site specific investigation and design by a suitably qualified professional.

This opinion does not remove the requirement for foundation inspection as would normally be carried out during construction by the relevant regulatory authorities. Any local soft spots identified shall be excavated and replaced with compacted hardfill. If actual conditions encountered are different from those described in this report, we should be notified.

7.2. Specific Issues

7.2.1. Sensitive Soils

A projection of soil layers indicates that there is some risk that sensitive soils encountered on site may be found at the surface along the north eastern face of the main ridge. This would affect lots where building foundations are to be founded in natural soils rather than fill materials.

Foundations in natural soils to be inspected by a suitably qualified professional to ensure that there are no specific hazards at the foundation locations. If sensitive soils are encountered then some alterations will be required to foundation construction.

The specific lots where this risk has been identified are indicated in the summary table included in Appendix A.

7.2.2. Building Restriction Lines

Proposed buildings that extend beyond the specified building restriction lines will need to address any potential slope stability issue with suitably engineered foundations.

A building restriction line has also been defined by others to ensure construction remains clear of retaining walls on site. Any structures located within this line are

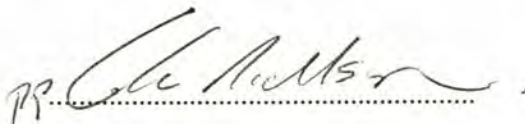
to be subject to specific design to ensure additional load is not placed on these retaining walls. These lines are also shown on the figures in Appendix B.

8. Applicability

This report has been prepared solely for the benefit of Durham Properties Ltd with respect to the particular brief given to us, and it may not be released to third parties, other than Western Bay of Plenty District Council, for any purpose without our prior review and written agreement.

TONKIN & TAYLOR LTD
Environmental and Engineering Consultants

Report prepared by:



C. J. Bauld
Senior Geotechnical Engineer
Office Manager - Tauranga

smbj
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PRODUCER STATEMENT – CONSTRUCTION

CONTRACTOR'S CERTIFICATE UPON COMPLETION OF SUBDIVISIONAL WORK

ISSUE BY : PEMBERTON CONSTRUCTION LTD
(Contractor)

TO : Durham Property Investments Ltd
(Principal)

TO BE SUPPLIED TO: Western Bays District Council;
(Territorial Authority)

IN RESPECT OF : Stage 1b, All Subdivisional Earthworks in the property of Lynley Park.
(Description of subdivisional work)

AT : Omokoroa Road
(Address)

PEMBERTON CONSTRUCTION LTD has contracted to Durham Property Investments Ltd
(Contractor) (Principal)

to carry out and complete certain subdivisional works in accordance with a contract, titled Lynley Park
C.K.L. Reference No: D1176 Stage 1b

I Russell Pemberton a duly authorised representative of : PEMBERTON CONSTRUCTION LTD
(Duly Authorised Agent) (Contractor)

hereby certify that PEMBERTON CONSTRUCTION LTD has carried out and completed the Subdivisional works, other than those outstanding works listed below, in accordance with the contract.

(Signature of Authorised Agent on behalf of)

Date Tuesday, 10 April 2007

(Contractor)

P.O. Box 5161

Hamilton

Outstanding Works

Nil.

Note; This producer statement excludes earthworks undertaken by others in Lot 89

Appendix A: Certification

To: The Western Bay of Plenty District Council

**STATEMENT OF PROFESSIONAL OPINION AS TO THE
GEOTECHNICAL SUITABILITY OF LAND FOR BUILDING**

DEVELOPMENT: Lynley Park Subdivision – Stage 1b
OWNER: Durham Properties Ltd
LOCATION: Omokoroa Road, Omokoroa Peninsula

I, Christopher John Bauld of Tonkin & Taylor Ltd, 12 Elizabeth Street, Tauranga, hereby confirm that:

- 1) I am a professional person, appropriately qualified with experience in geotechnical engineering to ascertain the suitability of the land for building development and was retained as the Soils Engineer for the above development.
- 2) An appropriate level of site investigation and construction supervision has been carried out under my direction and is described in the development evaluation report dated March 2004 (Stage 1, Lynley Park Omokoroa, Geotechnical Issues Report, Tonkin & Taylor Ltd).
- 3) In my professional opinion, not to be construed as a guarantee, I consider that:
 - a) The areas shown in my report dated April 2007 of each new allotment or on the development site are suitable for the erection thereon of the building types appropriate to the zoning of the land,, provided that: normal foundation inspections by the regulatory authorities and a suitably qualified engineer should be carried out during construction, and construction is in accordance with NZS 3604:1999 and related documents; building restriction lines indicate those areas where specific design is required.
 - b) The completed works give due regard to land slope and foundation stability considerations.
 - c) The earth fills shown on the attached plan (T&T Figure 1), have been placed in accordance with the Subdivision and Development Code of Practice of the Western Bay of Plenty District Council.
 - d) The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:1999 and related documents providing that
 - (i) normal foundation inspections by the regulatory authorities should be carried out during construction
 - (ii) construction is inside of the designated building restriction lines.
 - (iii) The ground outside of the designated building restriction lines should be suitable for the erection thereon of residential buildings subject to specific engineering investigation and design.
 - (iv) Inspections are especially important where concrete blockwork and/or brick veneer or stucco plaster buildings are sited partly on fill or partly on natural ground, or where they are entirely sited on filling whose depth changes significantly across the building platform. Any variations in soil conditions from those described in our report, should be reported to Tonkin & Taylor Ltd
 - e) The original ground not affected by filling should be suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:1999 and related documents provided that normal foundation inspections by the regulatory authorities and a suitably qualified engineer should be carried out during construction.
- 4) This professional opinion is furnished to the Council and the owner for their purpose alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection for any dwelling.

Signed: _____



Date: _____

08/04/07

Lynley Park Residential Subdivision - Stage 1b, Omokoroa

Summary of Geotechnical Data/Recommendations/Requirements for Individual Lots

Lot #	Area (m ²)	Subdivision filling (TOTAL FILL)	Natural topography earthworked? (TOTAL CUT)	Conventional shallow foundation to NZS 3604:1999	Specific design?	Foundations	Building line restriction? Y/N	Recommendations/restrictions
71	✓	Y	3.5m	Y	3.0m	Y	N	Foundation inspection by suitably qualified engineer
85	✓	Y	3.5m	N	-	Y	N	Foundation inspection by suitably qualified engineer
86	✓	Y	4.0m	N	-	Y	N	
87	✓	Y	4.0m	N	-	Y	N	
88	✓	Y	3.0m	N	-	Y	N	
89	✓	Y	3.0m	N	-	Y	N	
90	✓	Y	4.0m	N	-	Y	N	
91	✓	Y	4.0m	N	-	Y	N	
92	✓	Y	4.0m	N	-	Y	N	
93	✓	Y	3.5m	N	-	Y	N	
94	✓	Y	3.5m	N	-	Y	N	
95	✓	Y	4.0m	N	-	Y	N	
96	✓	Y	2.5m	Y	2.0m	Y	N	Foundation inspection by suitably qualified engineer
97	✓	Y	3.5m	N	-	Y	N	Foundation inspection by suitably qualified engineer

Lynley Park Residential Subdivision - Stage 1b, Omokoroa

Summary of Geotechnical Data/Recommendations/Requirements for Individual Lots

Lot #	Area (m ²)	Subsurface Data				Foundations		Building line restriction? Y/N	Recommendations/restrictions
		Subdivision filling (TOTAL FILL)		Natural topography earthworked? (TOTAL CUT)		Conventional shallow foundation to NZS 3604:1999	Specific design?		
		Y/N	Average Depth (m)	Y/N	Average Depth (m)	Y/N/NA	Y/N/NA		
98	✓	Y	4.0m	N	-	Y	N	N	Foundation inspection by suitably qualified engineer
99	✓	Y	3.5m	N	-	Y	N	N	
100	✓	Y	1.5m	N	-	Y	N	N	
101	✓	Y	1.0m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
102	✓	Y	0.5m	N	-	Y	N	N	Foundation inspection by suitably qualified engineer
103	✓	Y	0.5m	N	-	Y	N	N	Foundation inspection by suitably qualified engineer
104	✓	Y	1.0m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
105	✓	Y	1.5m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
106	✓	Y	2.0m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
107	✓	N	-	N	-	Y	N	N	Foundation inspection by suitably qualified engineer
108	✓	N	-	Y	0.5m	Y	N	N	Foundation inspection by suitably qualified engineer
109	✓	Y	3.5m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
110	✓	Y	4.5m	N	-	Y	N	Y	Foundation inspection by suitably qualified engineer
111	✓	Y	4.5m	N	-	Y	N	Y	

Lynley Park Residential Subdivision - Stage 1b, Omokoroa

Summary of Geotechnical Data/Recommendations/Requirements for Individual Lots

Lot #	Area (m ²)	Subsurface Data				Foundations		Building line restriction? Y/N	Recommendations/restrictions
		Subdivision filling (TOTAL FILL)		Natural topography earthworked? (TOTAL CUT)		Conventional shallow foundation to NZS 3604:1999	Specific design?		
		Y/N	Average Depth (m)	Y/N	Average Depth (m)	Y/N/NA	Y/N/NA		
112	✓	Y	6.0m	N	-	Y	N	Y	
113	✓	Y	7.0m	N	-	Y	N	Y	
114	✓	Y	3.0m	Y	1.0m	Y	N	Y	
115	✓	Y	6.0m	N	-	Y	N	Y	
116	✓	Y	9.0m	N	-	Y	N	Y	
117	✓	Y	8.5m	N	-	Y	N	Y	
118	✓	Y	7.0m	N	-	Y	N	Y	
119	✓	Y	3.5m	N	-	Y	N	Y	
120	✓	Y	2.5m	N	-	Y	N	Y	
121	✓	Y	1.5m	N	-	Y	N	Y	
125	✓	Y	2.5m	N	-	Y	N	Y	
126	✓	Y	2.0m	N	-	Y	N	Y	

Appendix B: Figures

- **Figure 1**



Appendix C: Field Density Tests

**ECES**

Evans Civil Engineering Services Ltd

14 Atkins Way
Ohauti Rd
TaurangaTelephone: (07) 544-4418
Facsimile: (07) 544-5563
E-mail: hcevans@bop.quik.co.nzDolph Rasmussen
A & R Contractor Ltd
O Box 253
aerona

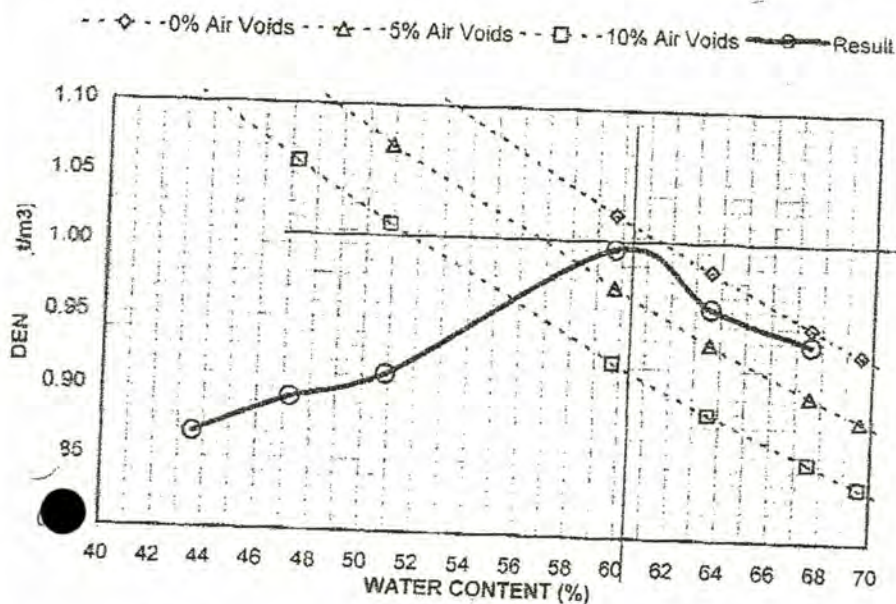
Attention: Mr D Rasmussen

RE: Contract Name: Lynley Park Subdivision
Location: 3000mm - 4700mm
Control Testing: Insitu Cut MaterialTest Completion Date: 13/04/2004
Lab Reference: TGA0007.14 1TL
Report No: 03/04/57/A
Order No. / Tender No: nil
Tested By: Karl Harrison
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1353
Date Sampled: 19/03/2004
Sample Condition: Natural
Date Received: 19/03/2004
Date Reported: 5/04/2004
Stockpile Volume: N/A
Stockpile No.: N/A
Page: 1 of 1

Client Request

Carry out a dry density / water content relationship test using the NZ Standard hammer on the above sample from Lynley Park Subdivision

Standards

NZS 4210:1986 Method of testing soils for civil engineering purposes
Determination of the dry density / water content relationship standard compaction
Determination of the water content

Water Content (%)	Dry Density (t/m³)
Result	
43.6	0.87
47.2	0.89
50.9	0.91
59.7	1.00
63.6	0.96
67.5	0.94

Maximum Dry Density t/m³ 1.00

Optimum Water Content % 60

Natural Water Content % 59.7

Solid Density (Assumed) t/m³ 2.65

1 The Material used in the test was fraction passing the 19mm test sieve

2 Endorsement of this Test Report refers to testing carried out by this laboratory staff.

REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Tested By: *Richard T McGee* Date: 5-4-04 Approved Signatory
Richard T McGee
Laboratory Supervisor
25/2/2002*Hayden Evans* Date: 05-04-04
Hayden Evans
Laboratory ManagerName: 2
Test 4.1.1 Determination of the dry density / water content relationship standard compactionAll tests reported
herein have been
performed in accordance
with the laboratory's

**ECES**

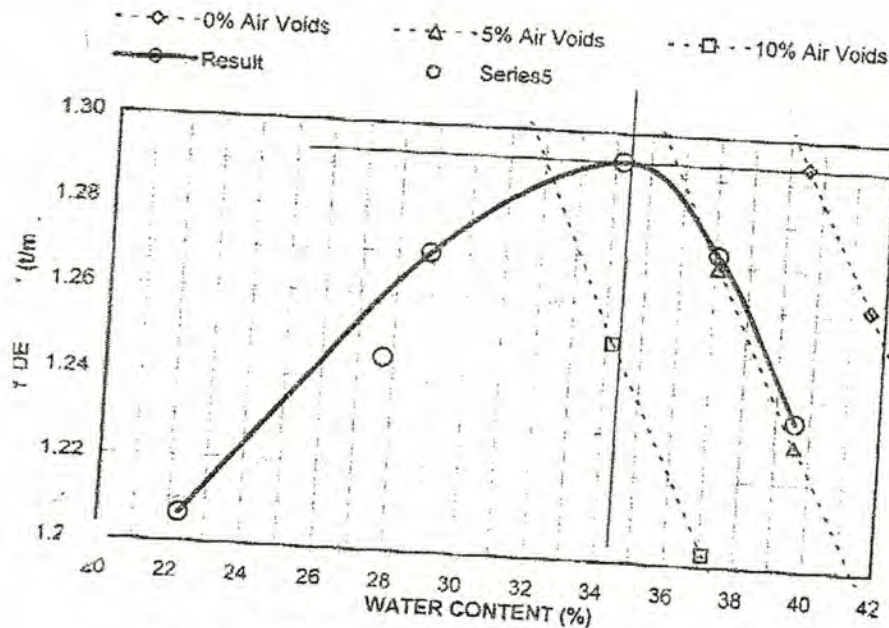
Evans Civil Engineering Services Ltd

14 Atkins Way
Ohauti Rd
TaurangaTelephone: (07) 544-4418
Facsimile: (07) 544-5568
E-mail: hcevans@bop.quik.co.nzDolph Rasmussen
A & R Contractor Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE: Contract Name: Lynley Park Subdivision
Location: 2000mm - 3000mm
Control Testing: Insitu Cut MaterialTest Completion Date: 26/04/2004
Lab Reference: TGA0007.14 1TL
Report No: 03/04/56/A
Order No. / Tender No: nil
Tested By: Karl Harrison
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1352
Date Sampled: 19/03/2004
Sample Condition: Natural
Date Received: 19/03/2004
Date Reported: 5/04/2004
Stockpile Volume: N/A
Stockpile No.: N/A
Page: 1 of 1**Client Request**

Carry out a dry density / water content relationship test using the NZ Standard hammer on the above sample from Lynley Park Subdivision

Test StandardsS 12: 1986 Method of testing soils for civil engineering purposes
Part 4.1.1 Determination of the dry density / water content relationship standard compaction
Test 2. Determination of the water content

Water Content (%)	Dry Density (t/m³)
Result	
22.3	1.21
27.7	1.25
28.9	1.27
34.2	1.29
37.1	1.27
39.6	1.23

Maximum Dry Density t/m³ 1.30

Optimum Water Content % 34

Natural Water Content % 34.2

Solid Density (Assumed) t/m³ 2.65

- 1 The Material used in the test was fraction passing the 19mm test sieve
- 2 Endorsement of this Test Report refers to testing carried out by this laboratory staff.

REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Tested By: *RMG*
Richard McGee
Laboratory Supervisor
25/2/2002

Date: 5-4-04 Approved Signatory

Hayden Evans
Hayden Evans
Laboratory Manager

Date 05-04-04

Test 4.1.1 Determination of the dry density / water content relationship standard compaction



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

**ECES**

Evans Civil Engineering Services Ltd

14 Atkins Way
Ohauiti Rd
TaurangaTelephone: (07) 544-4418
Facsimile: (07) 544-5568
E-mail: hcevans@bop.quik.co.nzJolph Rasmussen
A & R Contractor Ltd
Box 253
Tiroa

Attention: Mr D Rasmussen

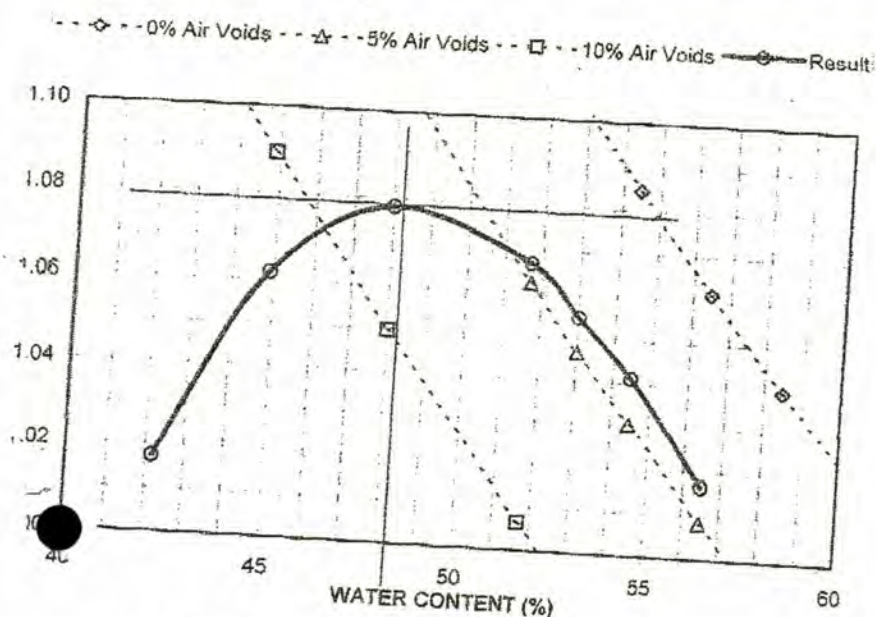
Contract Name: Lynley Park Subdivision
Location: 300mm - 2000mm
Control Testing: Insitu Cut MaterialTest Completion Date: 26/04/2004
Lab Reference: TGA0007.14 1TL
Report No: 03/04/55/A
Order No. / Tender No: nil
Tested By: Karl Harrison
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1351
Date Sampled: 19/03/2004
Sample Condition: Natural
Date Received: 19/03/2004
Date Reported: 5/04/2004
Stockpile Volume: N/A
Stockpile No.: N/A
Page: 1 of 1

Client Request

Carry out a dry density / water content relationship test using the NZ Standard hammer on the above sample from Lynley Park Subdivision

Standards

- 1986 Method of testing soils for civil engineering purposes
- Determination of the dry density / water content relationship standard compaction
- Determination of the water content



Water Content (%)	Dry Density (t/m³)
Result	
42.2	1.02
44.9	1.06
48.0	1.08
51.7	1.07
53.0	1.05
54.5	1.04

Maximum Dry Density t/m³ 1.08

Optimum Water Content % 48

Natural Water Content % 51.7

Solid Density (Assumed) t/m³ 2.65

1 The Material used in the test was fraction passing the 19mm test sieve

2 Endorsement of this Test Report refers to testing carried out by this laboratory staff.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

By: *Richard T. McGee*
Richard T. McGee
Laboratory Supervisor
25/2/2002

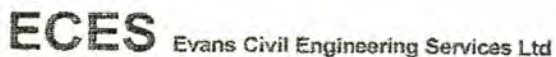
Date: 5-4-04 Approved Signatory

Hayden Evans
Hayden Evans
Laboratory Manager

Date 5-04-04

Test 4.1.1 Determination of the dry density / water content relationship standard compaction

All tests reported
herein have been
performed in accordance
with the laboratory's
scope of accreditation



14 Atkins Way Telephone: (07) 544-4418
Chauiti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Dolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name:	Lynley Park
Sample Source	In situ
Contract / No.:	Unknown
Quality Control Testing:	Bulk Fill

Test Completion Date:	23/03/2004
Lab Reference:	TGA0007.14 2TL
Report No:	03/04/65/A
Order / Tender No:	Nil
Tested By:	Hayden Evans
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	1358
Date Sampled:	23/03/2004
Date Received:	23/03/2004
Date Reported:	23/03/2004
Sample Condition:	Natural
Page:	1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

^ IZS 4407 : 1991

est 4.2.1

1402:1986

Tensi

House:

Test Results

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

[illegible]

→ J.M = Nuclear Densometer Measurement t/m^3

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be =

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

7 GPS Coordinates are based on the national grid not BOP grid

8 Chainage 140 Kaylene Road GPS E2777415 N6390092

9 Chainage 118 Kaylene Road GPS E2777435 N6390069

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Date: 23-3-04

Richard McGee
Laboratory Supervisor

23/10/01

1

ersion :

File Name:

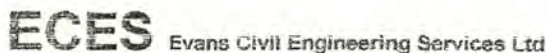
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Approved Signatory:

Hayden Evans
Laboratory Manager



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation



14 Atkins Way Telephone: (07) 544-4418
Ohauiti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Attention: Mr D Rasmussen

RE : Contract Name:	Lynley Park
Sample Source	Insitu
Contract / No.:	D1176
Quality Control Testing:	Bulk Fill

Test Completion Date:	29/03/2004
Lab Reference:	TGA0007.14 3TL
Report No:	03/04/751A
Order / Tender No:	Nil
Tested By:	Hayden Evans
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	1367
Date Sampled:	25/03/2004
Date Received:	25/03/2004
Date Reported:	29/03/2004
Sample Condition:	Natural
Page:	1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

7-4.2.1

402 : 1986

Tr

In House:

Test Results

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

[illegible]

D.M = Nuclear Densometer Measurement t/m^3

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be =

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor
23/10/01

Date: 29-3-04

Approved Signatory: [Signature] Date: 29 - 03

Hayden Evans
Laboratory Manager

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'ersion : 1
ile Name: 7

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Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



Dolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: D1176
Quality Control Testing: Bulk Fill

Test Completion Date: 31/03/2004
Lab Reference: TGA0007.14 4TL
Report No: 03/04/80/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1371
Date Sampled: 29/03/2004
Date Received: 29/03/2004
Date Reported: 31/03/2004
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

Method 4.2.1

NZS 4402 : 1986

Method 1

In House:

Test Results

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location (m)		Depth Of Fill (m)	N.D.M Wet Density t/m^3	N.D.M Dry Density t/m^3	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m^3	Total Voids %	Air Voids %	Shear Stress (Kpa)
11A	Peg 9 50.5	Peg 1 42.8	RL 25.557	1.74	1.09	58.5	38.5	1.25	52.7	4.5	138, 177, 173
12A	Peg 9 37.1	Peg 1 34.4	RL 24.105	1.76	1.32	33.5	42.8	1.23	53.4	0.6	173, 119, 134
13A	Peg 9 29.30	Peg 1 35.0	RL 23.26	1.71	1.18	44.5	42.0	1.20	54.6	4.0	253, 211, 261
14A	Peg 9 26.40	Peg 1 43.80	RL 24.15	1.60	1.03	55.0	53.8	1.04	60.8	4.8	219, 196, 246
15A	Peg 9 37.5	Peg 1 48.3	RL 25.365	1.59	1.04	53.5	47.9	1.08	59.4	7.7	>269, >269, 269
16A	Peg 6 51.00	Peg 8 46.3	RL 26.182	1.76	1.20	46.5	41.5	1.24	53.0	1.4	253, 157, 261

D.M = Nuclear Densometer Measurement t/m^3

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m^3

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by Hayden Evans From ECES Ltd



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:
Richard McGee
Laboratory Supervisor

Date: 31-3-04

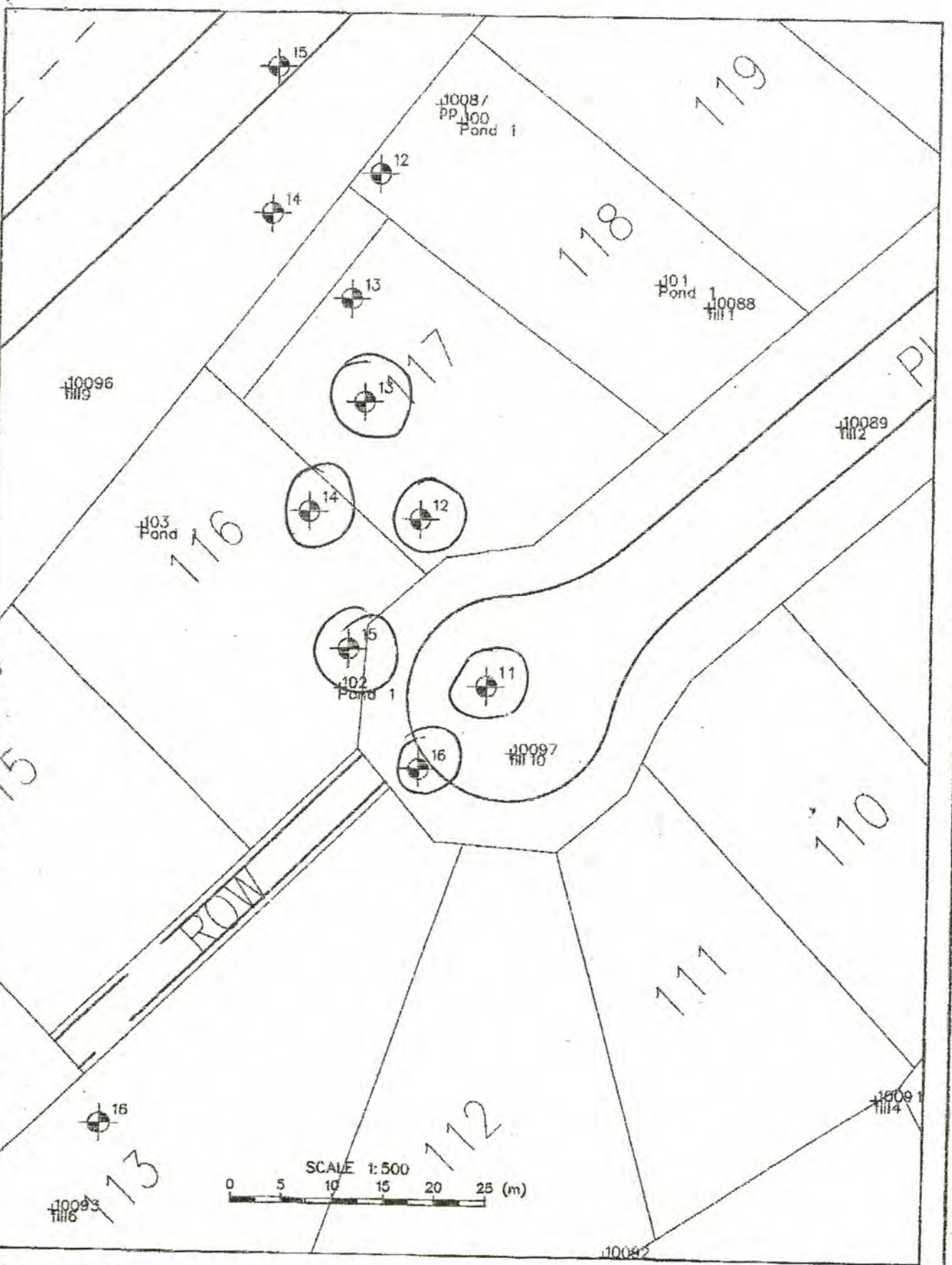
Approved Signatory:
Hayden Evans
Laboratory Manager

ate 23/10/01

Version: 1

File Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

L:\201 Hamilton jobs\2018 Lynley Park\checked from Penelope.Don
 100810_Lynley Park\checked from Penelope.Don
 100810_Lynley Park\checked from Penelope.Don



Tonkin & Taylor Environmental & Engineering Consultants ■ Teauranga ■ Auckland ■ Christchurch ■ Hamilton ■ Wellington ■ Whangarei	DRAWN	XXX	Barth
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	APPROVED		
	CADFILE		
	CADFILE		
SCALES (A4 SIZE) 1 in 500		PROJECT No. PROJECT	

LYNLEY PARK Title		REV. 0
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ECES Evans Civil Engineering Services Ltd

14 Atkins Way Telephone: (07) 544-4418
Ohauti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hceevans@bop.quik.co.nz

Rolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE: Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: D1176
Quality Control Testing: Bulk Fill

Test Completion Date: 2/04/2004
Lab Reference: TGA0007.14 5TL
Report No: 03/04/87/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1377
Date Sampled: 31/03/2004
Date Received: 31/03/2004
Date Reported: 2/04/2004
Sample Condition: Natural
Page: 1 of 2

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

N 1407 : 1991

Te. 4.2.1

NZ 402 : 1986

Test 2.1

In House:

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

Test Results

Test No.	Location Northing Easting (m)	Depth Of Fill (m)	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
17A	712006.5 261491.68	RL 26.317	1.70	1.04	64.0	54.3	1.10	58.4	-1.5	142, 119, 207
18A	712022.11 261481.07	RL 25.462	1.68	1.05	60.0	62.0	1.04	60.9	-3.4	196, 169, 161
19A	712032.67 261469.65	RL 24.502	1.66	1.04	59.5	46.9	1.13	57.4	4.6	230, 230, 234
20A	712010.68 261444.48	RL 25.932	1.76	1.19	47.5	46.9	1.20	54.8	-1.4	192, 265, 257
21A	711999.15 261456.93	RL 26.497	1.72	1.11	55.5	51.2	1.14	57.1	-1.2	111, 177, 153
22A	711986.51 261466.43	RL 27.234	1.67	1.05	59.5	52.9	1.09	58.8	0.9	234, 207, 192

1 N.D.M = Nuclear Densometer Measurement t/m³

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m³

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by Hayden Evans From ECES Ltd

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Richard McGee
Laboratory Supervisor

Date: 2-4-04

Approved Signatory:

Hayden Evans
Hayden Evans
Laboratory Manager

Date

23/10/01

Version :

1

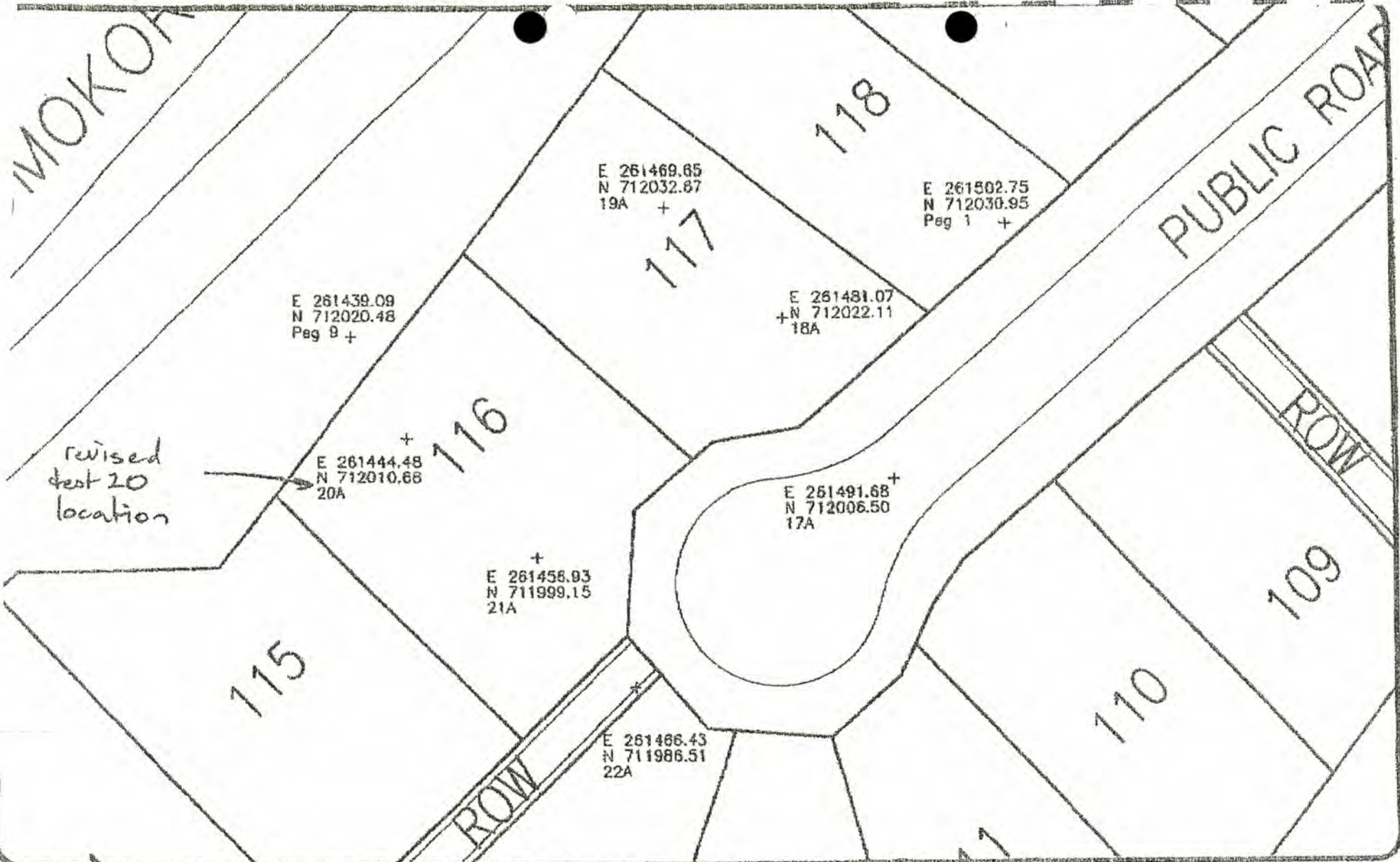
File Name:

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported
herein have been
performed in accordance
with the laboratory's

MOKOH



DCKL
Surveying and Planning
Setting New Boundaries

▶ AUCKLAND 8 Manukau Rd, New Market
09 524 7020

▶ HAMILTON 310 Tairāwhiti St
07 839 2081

▶ THE BAY OF PLENTY 88 Tairāwhiti St
07 871 5144

**Lynley Park Development
Test Locations
Stage 1**

Durham Properties Ltd

Issue	Description	Date

Scale: 1:500	Date: 1/04/04
Job No: D1176	Page No: 1 of 1
Rev: E1	

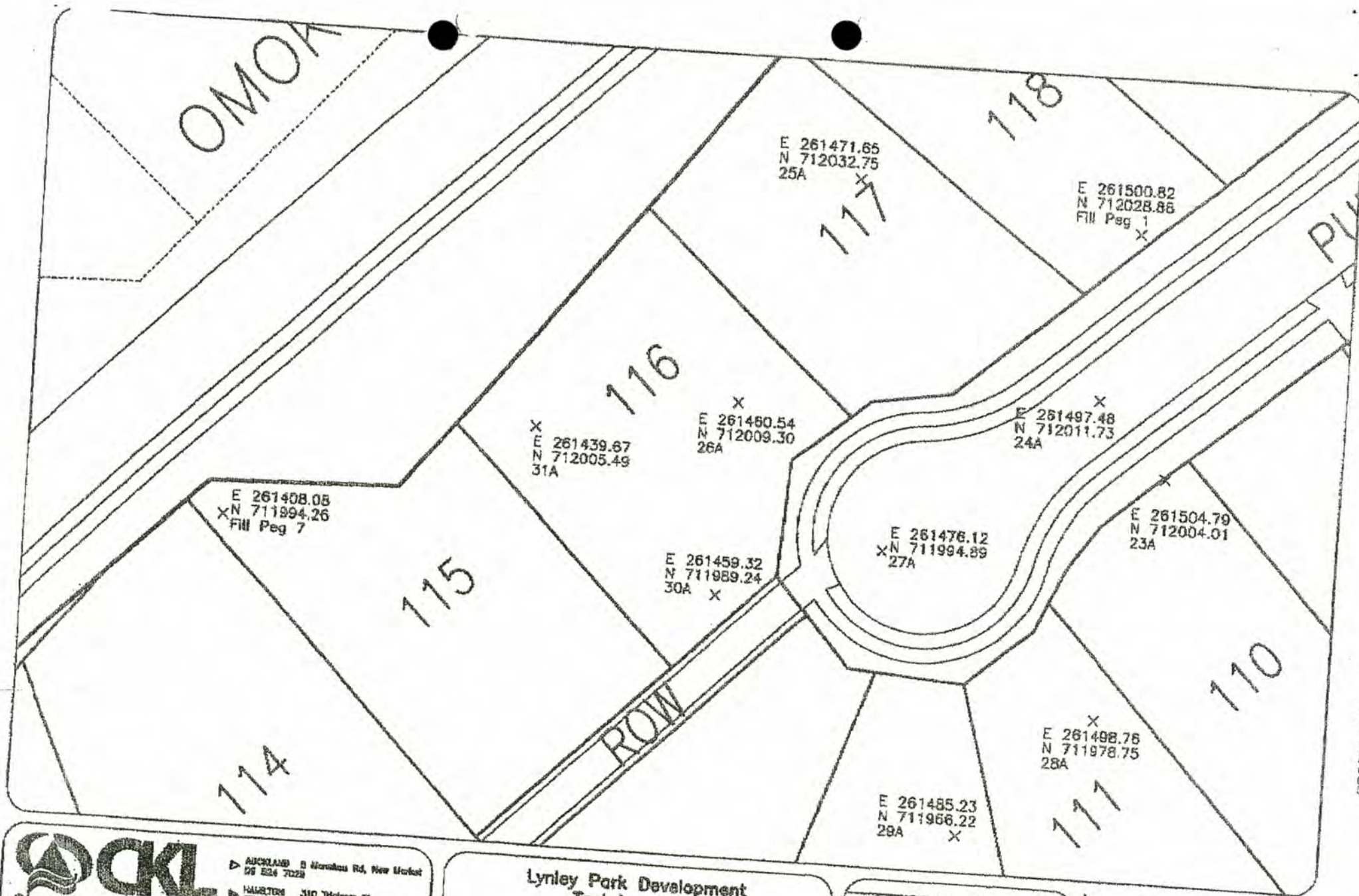


(07) 544-4418
(07) 544-5568
hcevans@bop.quik.co.nz

Test Completion Date:	7/04/2004
Lab Reference:	TGA0007.14 6T1
Report No:	04/04/10/A
Order / Tender No:	Nil
Tested By:	Hayden Evans
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	1387
Date Sampled:	5/04/2004
Date Received:	5/04/2004
Date Reported:	7/04/2004
Sample Condition:	Natural
Page:	1 of 2

File Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

All tests reported herein have been performed in accordance with the laboratory's



TOTAL P.02

CKL
Surveying and Planning
Setting New Boundaries

> AUCKLAND 8 Marsden Rd, New Market
 09 834 7029
 > HAMILTON 310 Watson St
 07 839 2087
 > TE ANAU 68 Ticesdale St
 07 871 8144

Lynley Park Development
Test Locations
Stage 1

Durham Properties Ltd

Issue	Description	Date

Scale: 1:500	Date: 05/04/04
Job No: D1178	Page No: 1 of 1
	Rev E1

101 0440066

P.02/02



ECES

Evans Civil Engineering Services Ltd

14 Atkins Way Telephone: (07) 544-4418
Ohauti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Dolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 15/04/2004
Lab Reference: TGA0007.14 7TL
Report No: 04/04/26/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1401
Date Sampled: 8/04/2004
Date Received: 8/04/2004
Date Reported: 15/04/04
Sample Condition: Natural
Page: 1 of 2

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991 Method of testing and sampling road aggregates
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
N 4402 : 1986 Method of testing soils for Civil Engineering purposes
Ti 2.1 Determination of the water content
In use: Operating procedures for the uses of Geotechnics Torque Head

Test Results

Test No.	Location Northing	Location Easting	Depth Of Fill	N.D.M Wet Density t/m^3	N.D.M Dry Density t/m^3	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m^3	Total Voids %	Air Voids %	Shear Stress (Kpa)
32A	711983.4	261514.6	RL 31.43	1.67	1.11	50.0	50.4	1.11	58.0	2.0	200, 230, >269
33A	711974.0	261506.0	RL 32.125	1.77	1.17	50.5	54.2	1.15	56.8	0.0	161, 180, 134
34A	711957.6	261495.6	RL 32.847	1.69	1.15	47.5	41.7	1.20	54.9	5.0	223, 108, 180
35A	711988.1	261481.4	RL 31.492	1.69	1.14	48.5	49.1	1.13	57.3	1.7	148, 261, 234
36A	712001.7	261496.9	RL 30.170	1.74	1.19	46.0	45.6	1.20	54.8	0.2	146, 138, 169
37A	712008.7	261445.6	RL 29.610	1.74	1.18	47.0	49.2	1.16	56.1	0.0	219, 215, 223
38A	712027.4	261461.9	RL 28.840	1.65	1.13	45.5	51.3	1.09	59.0	3.0	246, 215, 265
39A	712046.3	261484.1	RL 27.200	1.79	1.23	44.5	42.3	1.25	52.7	0.0	204, 257, 154
40A	712065.6	261493.4	RL 25.885	1.71	1.25	37.0	34.4	1.27	52.0	8.1	215, 200, 192

* D.M = Nuclear Densometer Measurement t/m^3

ven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m^3

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor

Date: 15. 4 - 04

Approved Signatory:

Hayden Evans
Laboratory Manager

Date: 15 - 04 - 04

23/10/01

1

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance with the laboratory's



ECES

Evans Civil Engineering Services Ltd

14 Atkins Way Telephone: (07) 544-4418
Ohauti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Joseph Rasmussen
& R Contractors Ltd
PO Box 253
Tauranga

Attention: Mr D Rasmussen

Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 20/04/2004
Lab Reference: TGA0007.14 8TL
Report No: 04/04/40/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1411
Date Sampled: 16/04/2004
Date Received: 16/04/2004
Date Reported: 21/04/2004
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

IS 4407 : 1991 Method of testing and sampling road aggregates
IS 2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
NZS 42 : 1986 Method of testing soils for Civil Engineering purposes
Test 4.1 Determination of the water content
House: Operating procedures for the uses of Geotechnics Torque Head

Test Results

Test No.	Location Easting	Location Northing	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
41A	261500.182	711986.523	RL 30.796	1.65	1.06	55.5	47.4	1.12	57.8	4.7	130, 165, 216
42A	261485.522	711971.784	RL 31.989	1.70	1.09	56.0	46.4	1.16	56.3	2.5	156, 205, 147
43A	261452.438	711964.007	RL 32.259	1.74	1.22	42.5	40.5	1.24	53.2	3.0	176, 182, 208
44A	261465.919	711979.982	RL 31.269	1.66	1.09	53.0	42.6	1.17	56.0	6.3	162, 225, 222
45A	261482.552	711999.912	RL 29.675	1.72	1.15	50.0	47.2	1.17	55.8	0.5	156, 199, 179
46A	261478.268	712041.622	RL 27.064	1.76	1.28	37.5	41.0	1.25	52.9	1.6	188, 130, 192
47A	261460.674	712026.927	RL 27.317	1.79	1.26	42.0	39.7	1.28	51.7	0.8	199, 153, 196
48A	261434.288	712007.217	RL 28.490	1.72	1.13	52.5	44.3	1.19	55.0	2.2	165, 136, 165

N.D.M = Nuclear Densometer Measurement t/m³

- 2 Oven = Standard oven method
- 3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
- 4 Solid Density is assumed to be = 2.65 t/m³
- 5 All Nuclear Densometer Measurements are at the depth of 300mm
- 6 All test locations were chosen by the contractor.



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By: *RMG*
Richard McGee
Laboratory Supervisor

Date: 21-4-04

Approved Signatory: *Hayden Evans*
Hayden Evans
Laboratory Manager

Version: 23/10/01

File Name: 1
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

**ECES**

Evans Civil Engineering Services Ltd

14 Atkins Way
Ohauiti Rd
TaurangaTelephone:
Facsimile:
E-mail:(07) 544-4418
(07) 544-5568
hcevens@bop.quik.co.nzDolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: Unknown
Quality Control Testing: Bulk FillTest Completion Date: 22/04/2004
Lab Reference: TGA0007.14 9TL
Report No: 04/04/52/A
Order / Tender No: Nil
Tested By: Richard Mc Gee
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1423
Date Sampled: 20/04/2004
Date Received: 20/04/2004
Date Reported: 22/04/2004
Sample Condition: Natural
Page: 1 of 1**Client Request**

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

4.2.1

402 : 1986

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

Test

In House:

Test Results

Test No.	Location Easting	Location Northing	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
9A	261548.01	712127.408	RL 26.896	1.69	1.11	52.5	51.6	1.11	58.1	0.7	159, 173, 193
50A	261557.64	712151.32	RL 26.733	1.62	1.08	50.5	47.6	1.10	58.6	6.4	172, 185, 180
1A	261574.19	712158.40	RL 26.805	1.68	1.15	45.5	50.0	1.12	57.7	1.7	162, 169, 170
2A	261628.63	712186.17	RL 28.563	1.61	1.09	47.0	52.1	1.06	60.1	5.2	224, 216, 229
53A	261648.46	712169.063	RL 29.186	1.71	1.22	40.0	42.7	1.20	54.8	3.6	159, 162, 166
54A	261670.99	712142.129	RL 30.574	1.65	1.16	42.0	39.3	1.18	55.4	9.0	>228, >228, >228
5A	261490.09	712069.881	RL 27.694	1.68	1.18	43.0	39.5	1.21	54.5	6.8	166, 183, 160
56A	261453.48	712019.014	RL 29.262	1.76	1.25	41.0	38.3	1.28	51.9	3.0	169, 216, 214
57A	261430.06	711996.609	RL 31.128	1.77	1.25	41.5	37.2	1.29	51.2	3.1	154, 160, 144
1A	261480.96	712049.40	RL 28.145	1.74	1.21	44.0	42.5	1.22	54.0	2.2	183, 176, 176

1 N.D.M = Nuclear Densometer Measurement t/m³

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be =

2.65 t/m³

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor
23/10/01

Date: 22-4-04

Approved Signatory:

Hayden Evans
Laboratory Manager

Revision:

1

Test Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

All tests reported
herein have been
performed in accordance
with the laboratory's
scope of accreditation



Dolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 25/04/2004
Lab Reference: TGA0007.14 10TL
Report No: 04/04/63/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1429
Date Sampled: 21/04/2004
Date Received: 21/04/2004
Date Reported: 25/04/2004
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

Test 4.2.1

AS 1402 : 1986

4.1

In House:

Test Results

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location Easting	Location Northing	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
59A	261524.941	712099.984	27.387	1.74	1.25	39.0	37.9	1.26	52.4	4.6	188, 188, 214
60A	261543.633	712122.401	28.101	1.65	1.13	46.0	48.0	1.12	57.9	4.2	211, 222, >228
61A	261566.021	712150.117	28.226	1.61	1.02	58.0	49.9	1.08	59.4	5.8	188, 188, 191
62A	261597.386	712189.346	28.434	1.48	0.94	57.5	48.5	1.00	62.4	14.0	214, 214, 182
63A	261551.289	712038.875	31.007	1.66	1.09	52.0	56.6	1.06	60.0	0.1	199, 196, 188
64A	261522.235	712009.748	31.033	1.78	1.21	47.0	39.4	1.27	51.9	1.8	205, >228, 196
65A	261498.781	711994.45	31.629	1.75	1.16	48.8	41.7	1.24	53.4	1.9	185, 216, 208
66A	261544.358	712009.129	32.553	1.75	1.16	51.0	43.3	1.22	53.8	0.8	205, 176, 182

1. D.M = Nuclear Densometer Measurement t/m³

2. Oven = Standard oven method

3. Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4. Solid Density is assumed to be = 2.65 t/m³

5. All Nuclear Densometer Measurements are at the depth of 300mm

6. All test locations were chosen by the contractor.



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

HIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Richard McGee
Laboratory Supervisor

Date: 25-4-04

Approved Signatory:

Hayden Evans
Hayden Evans
Laboratory Manager

ate

ersion :

23/10/01

1

ile Name:

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



ECES

Evans Civil Engineering Services Ltd

14 Atkins Way Telephone: (07) 544-4418
Ohautiti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Dolph Rasmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: Insitu
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 29/04/2004
Lab Reference: TGA0007.14 11TL
Report No: 04/04/74/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Hayden Evans
Sample Method: N/A
Sample No.: 1440
Date Sampled: 27/04/2004
Date Received: 27/04/2004
Date Reported: 3/05/2004
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

st 4.2.1

'S 4402 : 1986

st 2.1

In House:

Test Results

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location		RL	N.D.M. Wet Density t/m ³	N.D.M. Dry Density t/m ³	N.D.M. Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
67A	712099.11	261541.31	28.04	1.67	1.06	57.0	52.4	1.09	58.8	1.5	188, 180, 190
68A	712083.13	261528.69	28.34	1.70	1.15	47.5	44.6	1.18	55.6	3.2	156, 185, 165
69A	712075.73	261541.24	29.15	1.56	0.97	61.0	40.9	1.10	58.4	13.2	150, 175, 202
70A	712072.61	261555.80	30.09	1.65	1.06	55.0	50.4	1.09	58.7	3.6	186, 173, 159
71A	712086.88	261565.56	30.40	1.67	1.15	44.5	42.2	1.17	55.8	6.3	199, 202, 185
72A	712096.62	261572.65	30.42	1.73	1.17	48.0	46.7	1.18	55.6	0.7	170, 162, 173
73A	712107.05	261567.90	29.57	1.70	1.13	50.0	46.3	1.16	56.2	2.5	170, 202, 193
74A	712113.63	261556.09	28.58	1.71	1.18	45.5	46.7	1.17	56.0	1.5	144, 162, 170
75A	712095.44	261556.15	29.42	1.69	1.18	43.5	49.1	1.13	57.3	1.7	190, 214, 205

tes

- 1 N.D.M = Nuclear Densometer Measurement t/m³
- 2 Oven = Standard oven method
- 3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
- 4 Solid Density is assumed to be = 2.65 t/m³
- 5 All Nuclear Densometer Measurements are at the depth of 300mm
- 6 All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor

Date: 3-5-04

Approved Signatory:

Hayden Evans
Laboratory Manager

Date

Version :

File Name:

23/10/01

1

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance with the laboratory's



(07) 544-4418
(07) 544-5568
hcevans@bop.quik.co.nz

Test Completion Date:	27/04/2004
Lab Reference:	TGA0007.14 12TL
Report No:	09/04/36/A
Order / Tender No:	Nil
Tested By:	R McGee
Sample By:	R McGee
Sample Method:	N/A
Sample No.:	1563
Date Sampled:	23/09/2004
Date Received:	23/09/2004
Date Reported:	28/09/2004
Sample Condition:	Natural
Page:	1 of 1

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

[illegible]

7 Test 62B & 69B were cut down from existing level to approximately the same level as the original level of test 62A & 69A

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Approved Signatory:  Date: 30. 9. 07
Hayden Evans
Laboratory Manager

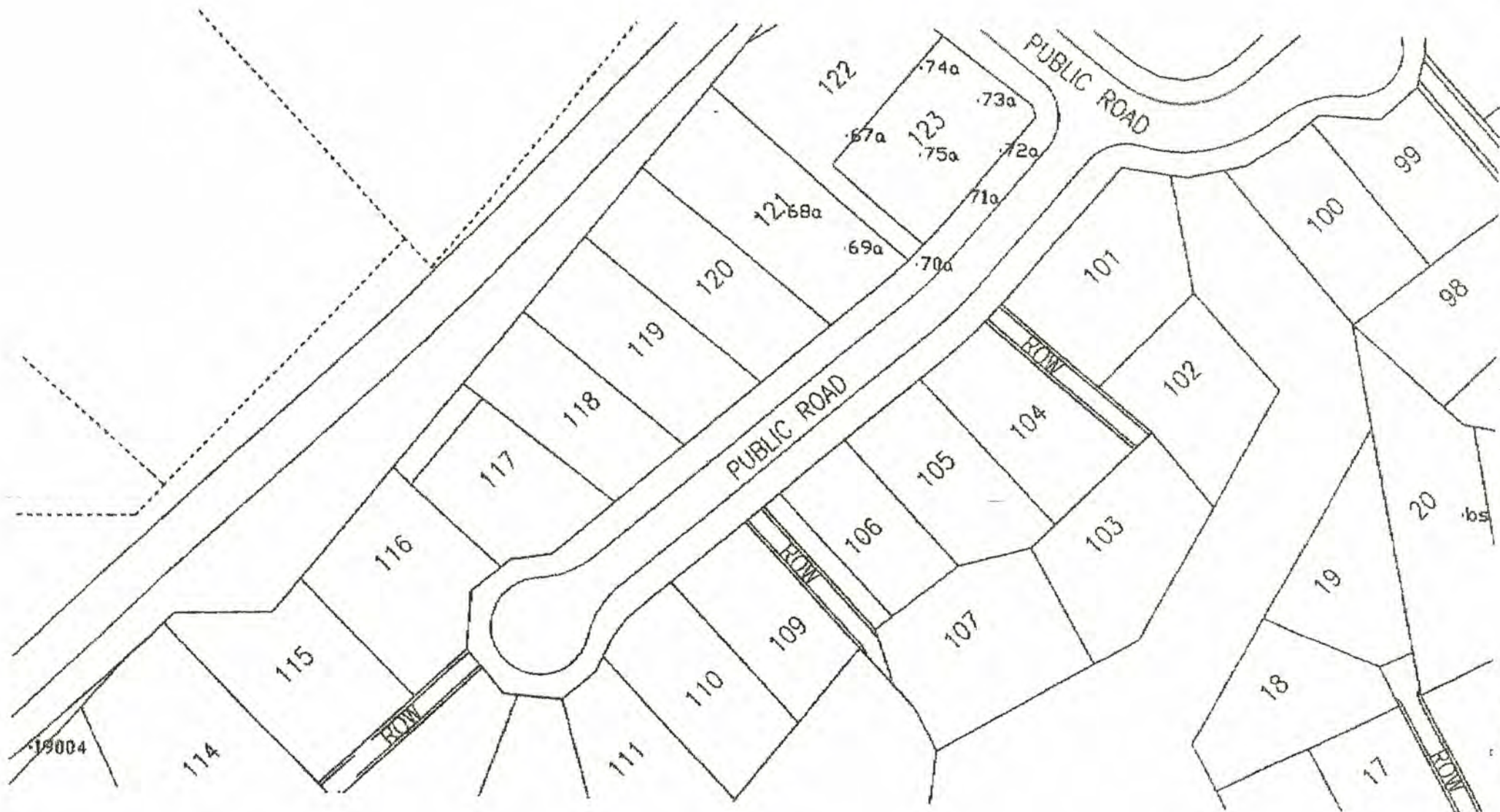
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



(07) 544-4418
(07) 544-5568
hceevans@bop.quik.co.nz

Test Completion Date:	30/09/2004
Lab Reference:	TGA0007.14 13TI
Report No:	09/04/45/A
Order / Tender No:	Nil
Tested By:	Hayden Evans
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	1572
Date Sampled:	29/09/2004
Date Received:	29/09/2004
Date Reported:	30/09/2004
Sample Condition:	Natural
Page:	1 of 1

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.





Rolph Rasmussen
& R Contractors Ltd
P O Box 253
Paeroa

Attention: Mr D Rasmussen

RE : Contract Name: Lynley Park
Sample Source: On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 15/12/2004
Lab Reference: TGA0007.14 18TL
Report No: 12/04/36/AP1
Order / Tender No: Nil
Tested By: Richard McGee/Tracy Barnes
Sample By: Hayden Evans/Richard McGee
Sample Method: N/A
Sample No.: 1731
Date Sampled: 10/12/2004
Date Received: 10/12/2004
Date Reported: 20/12/2004
Sample Condition: Natural
Page: 1 of 2

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

STSS 4407 : 1991

Test 4.2.1

STSS 4402 : 1986

Test

Results

Results

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location	Depth Of Fill	N.D.M. Wet Density t/m ³	N.D.M. Dry Density t/m ³	N.D.M. Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
06A	261711.925 712098.882	RL 35.815	1.67	1.19	40.0	40.0	1.19	54.9	7.2	216, >228, >228
A	261704.571 712102.578	RL 34.831	1.70	1.14	48.5	50.1	1.13	57.4	0.7	165, 162, 165
A	261693.907 712089.060	RL 35.519	1.71	1.23	39.0	46.3	1.17	55.8	1.6	193, 214, 182
A	261693.430 712080.507	RL 36.894	1.66	1.05	58.5	55.5	1.07	59.7	0.4	133, 165, 183
09A	261668.941 712118.224	RL 33.703	1.78	1.29	37.5	49.3	1.19	55.1	0.0	225, Refusal, 190
A	261677.463 712131.576	RL 32.656	1.77	1.27	40.0	43.8	1.23	53.5	0.0	170, 154, 180
A	261655.121 712160.478	RL 31.138	1.65	1.10	50.1	55.3	1.06	60.0	1.4	175, 173, 170
12A	261639.179 712180.564	RL 30.091	1.69	1.10	53.3	56.9	1.07	59.4	0.0	158, 176, 143
13A	261609.597 711667.912	RL 20.073	1.69	1.19	41.7	43.3	1.18	55.4	4.3	Refusal
A	261634.664 711693.634	RL 18.803	1.71	1.21	41.0	48.0	1.15	56.5	1.2	193, 182, 154
14A	261665.576 711739.576	RL 18.366	1.60	1.11	44.0	49.6	1.07	59.8	6.9	190, 208, 172
16A	261690.141 711736.145	RL 17.890	1.65	1.14	44.5	52.3	1.08	59.2	2.6	190, 192, 175

- 1 M = Nuclear Densometer Measurement t/m³
- 2 C = Standard oven method
- 3 Air-voids & Total Voids are calculated using oven water contents & the corrected dry density
- 4 Solid Density is assumed to be = 2.65 t/m³
- 5 All Nuclear Densometer Measurements are at the depth of 300mm
- 6 All test locations were chosen by the contractor.



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By: *RMG*
Richard McGee
Laboratory Supervisor
23/10/01

Date: 20-12-04

Approved Signatory: *HE*
Hayden Evans
Laboratory Manager
Date: 20-12-04

ion : 1
Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



ECES

Evans Civil Engineering Services Ltd

14 Atkins Way Telephone: (07) 544-5568
Ohauiti Rd Facsimile: hceyans@bop.quik.co.
Tauranga E-mail: nz

Dolph Rassmussen
A & R Contractors Ltd
PO Box 253
Paeroa

Attention: Mr D Rassmussen

RE : Contract Name: Lynley Park
Sample Source: On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 15/12/2004
Lab Reference: TGA0007.14 18TL
Report No: 12/04/36/AP2
Order / Tender No: Nil
Tested By: Richard McGee/Tracy Barnes
Sample By: Hayden Evans/Richard McGee
Sample Method: N/A
Sample No.: 1731
Date Sampled: 10/12/2004
Date Received: 10/12/2004
Date Reported: 20/12/2004
Sample Condition: Natural
Page: 2 of 2

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

Test 4.2.1

NZS 4402 : 1986

Test 2

Test 3

Test 4

Test 5

Test 6

Test 7

Test 8

Test 9

Test 10

Test 11

Test 12

Test 13

Test 14

Test 15

Test 16

Test 17

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Test 277

Test 278

Test 279

Test 280

Test 281



Philip Rassmussen
& R Contractors
P O Box 253
Pieroa

Attention: Mr D Rassmussen

Contract Name: Lynley Park
Sample Source: On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 20/12/2004
Lab Reference: TGA 0007.14 19TL
Report No: 12/04/48/A
Order / Tender No: Nil
Tested By: Richard McGee
Sample By: Richard McGee
Sample Method: N/A
Sample No.: 1740
Date Sampled: 17/12/2004
Date Received: 17/12/2004
Date Reported: 20/12/2004
Sample Condition: Natural
Page: 1 of 1

Client Request

Carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

IS 4407 : 1991 Method of testing and sampling road aggregates
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
NZS 4212 : 1986 Method of testing soils for Civil Engineering purposes
Test 4.2.1 Determination of the water content
House: Operating procedures for the uses of Geotechnics Torque Head

Test Results

Test No.	Location	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
125A	712063.061 261738.549	RL 39.098	1.78	1.25	42.5	46.2	1.22	54.0	0.0	196, >228, >228
126A	712053.212 261733.759	RL 39.763	1.66	1.13	46.0	47.5	1.12	57.6	4.3	175, 195, 172
127A	712081.707 261722.144	RL 39.359	1.81	1.30	39.0	35.1	1.34	49.5	2.6	Refusal
128A	711803.056 261793.218	RL 13.155	1.62	1.11	46.0	58.3	1.02	61.4	1.8	190, 205, 228
129A	711790.595 261787.733	RL 13.213	1.65	1.18	39.5	42.3	1.16	56.2	7.1	144, 173, 190
130A	711779.753 261788.621	RL 14.054	1.70	1.23	38.5	39.9	1.22	54.1	5.6	>228, 205, >228
131A	711620.458 261571.218	RL 22.606	1.61	1.09	48.2	58.7	1.01	61.7	2.2	176, 190, 188
132A	711610.662 261560.249	RL 22.877	1.56	1.07	46.5	58.7	0.98	62.9	5.1	190, 208, 193
133A	711604.531 261553.204	RL 23.709	1.58	1.08	46.6	59.2	0.99	62.6	3.8	196, 186, 185

N.D.M = Nuclear Densometer Measurement t/m³

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m³

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor

Date: 20-12-04

Approved Signatory:

Hayden Evans
Laboratory Manager

Date: 23/10/01

Version: 1

File Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



Delph Rassmussen
A & R Contractors
PO Box 253
Paeroa

Attention: Mr D Rassmussen

RE : Contract Name: Lynley Park
Sample Source: On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 19/01/2005
Lab Reference: TGA0007.14 20TL
Report No: 01/05/14/A
Order / Tender No: Nil
Tested By: R McGee/T Barnes
Sample By: Richard McGee
Sample Method: N/A
Sample No.: 1762
Date Sampled: 17/01/2005
Date Received: 17/01/2005
Date Reported: 2/02/2005
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991
Test 4.2.1
IS 4402 : 1986

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test Results

Test No.	Location	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
34A	711713.43 261643.076	RL18.920	1.68	1.20	39.5	48.2	1.13	57.3	2.8	180, 175, 180
135A	711657.559 261611.926	RL20.532	1.64	1.13	45.0	46.6	1.12	57.7	5.4	216, 208, 219
136A	711629.197 261552.021	RL22.179	1.67	1.11	50.0	64.4	1.01	61.7	0.0	202, 227, 203
137A	711609.442 261534.87	RL22.365	1.70	1.19	43.0	54.7	1.10	58.6	0.0	172, 172, 176
138A	711735.342 261672.272	RL18.078	1.77	1.27	39.0	39.8	1.26	52.3	1.9	Refusal
139A	711720.818 261718.314	RL18.516	1.64	1.18	38.5	42.5	1.15	56.6	7.7	205, 214, 201
140A	711752.791 261772.547	RL13.708	1.73	1.19	45.2	47.1	1.18	55.5	0.0	144, 156, 160, 170
141A	711791.28 261798.491	RL12.445	1.70	1.19	42.7	46.6	1.16	56.3	2.4	Refusal

Notes

1. N.D.M = Nuclear Densometer Measurement t/m³
2. Oven = Standard oven method
3. Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
4. Solid Density is assumed to be = 2.65 t/m³
5. All Nuclear Densometer Measurements are at the depth of 300mm
6. All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Richard McGee
Laboratory Supervisor
23/10/01

Date: 2-2-05

Approved Signatory: *Hayden Evans*
Hayden Evans
Laboratory Manager
Date: 02-02-05

Location:

Test Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance



Dolph Rassmussen
A & R Contractors
PO Box 253
Paeroa

Attention: Mr D Rassmussen

RE : Contract Name: Lynley Park
Sample Source: On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 27/01/2005
Lab Reference: TGA0007.14 21TL
Report No: 01/05/43/A
Order / Tender No: Nil
Tested By: R McGee/T Barnes
Sample By: Richard McGee
Sample Method: N/A
Sample No.: 1785
Date Sampled: 24/01/2005
Date Received: 24/01/2005
Date Reported: 2/02/2005
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

Test 4.2.1

4402 : 1986

T 1.1

In house:

Test Results

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location Northing	Location Easting	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
142A	711671.671	261616.872	RL21.352	1.68	1.21	39.0	46.2	1.15	56.7	3.6	Refusal
143A	711619.723	261538.223	RL24.678	1.59	1.02	56.0	64.8	0.96	63.6	1.1	173, 159, 163
144A	711704.746	261642.468	RL20.014	1.69	1.17	44.0	53.6	1.10	58.5	0.0	156, 190, 182
145A	711732.097	261683.836	RL18.635	1.70	1.23	37.5	42.4	1.19	55.0	4.6	173, 170, 173
146A	711723.550	261724.848	RL17.646	1.63	1.06	53.5	55.8	1.05	60.5	2.2	>228, 183, 196
147A	711721.770	261738.446	RL17.257	1.62	1.10	47.0	54.5	1.05	60.5	3.3	177, 177, 193
148A	711728.869	261753.447	RL16.519	1.76	1.33	31.6	44.0	1.22	54.0	0.3	176, 175, 144
149A	711752.841	261776.110	RL15.176	1.64	1.15	42.0	41.5	1.16	56.4	8.4	162, 159, 146
150A	711777.530	261800.495	RL13.474	1.71	1.20	42.5	55.3	1.10	58.4	0.0	173, 190, 153
151A	711789.308	261774.360	RL14.732	1.66	1.18	40.6	51.3	1.10	58.6	2.3	>228, >228, >228

1 D.M = Nuclear Densometer Measurement t/m³

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m³

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

checked By:

Tracy Barnes
Laboratory Technician

Date: 2-2-05

Approved Signatory:

Richard McGee
Laboratory Supervisor
Date: 2-2-05

ite

23/10/01

version :

1

File Name:

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance



Dolph Rassmussen
A & R Contractors Ltd
P O Box 253
Paeroa

Attention: Mr D Rassmussen

RE : Contract Name: Lynley Park
Sample Source On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date: 14/02/2005
Lab Reference: TGA0007.14 23TL
Report No: 02/05/11/A
Order / Tender No: Nil
Tested By: Hayden Evans
Sample By: Richard McGee
Sample Method: N/A
Sample No.: 1820
Date Sampled: 10/02/2005
Date Received: 10/02/2005
Date Reported: 17/02/2005
Sample Condition: Natural
Page: 1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991

Test 4.2.1

ISO 402 : 1986

Test 4.2.1

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Test Results

Method of testing and sampling road aggregates
Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
Method of testing soils for Civil Engineering purposes
Determination of the water content
Operating procedures for the uses of Geotechnics Torque Head

Test No.	Location Northing	Location Easting	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
61A	711789.112	261790.563	RL15.109	1.69	1.10	54.0	50.9	1.12	57.8	0.8	196, 185, 190
162A	711747.179	261781.514	RL16.186	1.65	1.12	48.5	40.0	1.19	55.2	7.7	>228, Refusal
163A	711730.425	261742.917	RL17.428	1.68	1.04	61.0	61.4	1.04	60.6	0.0	175, 170, 172
164A	711722.923	261711.681	RL18.958	1.76	1.16	51.5	48.0	1.19	55.1	0.0	182, 183, 182
165A	711748.551	261677.048	RL19.873	1.71	1.12	52.5	50.6	1.14	57.1	0.0	Refusal
166A	711732.479	261647.488	RL20.763	1.72	1.14	50.5	50.8	1.14	57.1	0.0	196, 203, 188
167A	711705.467	261626.385	RL21.554	1.75	1.22	43.3	45.5	1.20	54.7	0.2	Refusal
168A	711659.620	261621.202	RL23.107	1.76	1.28	38.1	30.9	1.35	49.2	7.7	173, 160, 170
169A	711629.425	261536.831	RL24.708	1.72	1.16	48.2	44.1	1.20	54.8	2.1	Refusal
170A	711617.106	261522.175	RL24.971	1.67	1.06	57.2	46.0	1.14	56.9	4.5	157, 180, 167
171A	711789.535	261364.796	RL37.231	1.76	1.27	37.9	29.3	1.36	48.7	6.8	183, 189, 173

1. N.D.M = Nuclear Densometer Measurement t/m³

2. Oven = Standard oven method

3. Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
4. Solid Density is assumed to be = 2.65 t/m³

5. All Nuclear Densometer Measurements are at the depth of 300mm

6. All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor
23/10/01

Date: 17-2-05

Approved Signatory:

Hayden Evans
Laboratory Manager

On:

Name:

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance



14 Atkins Way Telephone: (07) 544-4418
 Ohauti Rd Facsimile: (07) 544-5568
 Tauranga E-mail: hcevans@bopquik.co.nz

Dolph Rassmussen
& R. Contractors Ltd
O Box 253
Paseo

Attention: Mr D Rassmussen

RE : Contract Name: Lynsie Park
Sample Source On Site
Contract / No.: Unknown
Quality Control Testing: Bulk Fill

Test Completion Date:	24/02/2005
Lab Reference:	TGAC007.14 24 T1
Report No:	02/05/49/A
Order / Tender No:	Nil
Tested By:	Tracy Barnes
Sample By:	Richard McGee
Sample Method:	N/A
Sample No.:	1849
Date Sampled:	22/02/2005
Date Received:	22/02/2005
Date Reported:	24/02/2005
Sample Condition:	Natural
Page:	1 of 1

Content Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

VZS 4407 : 1991

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02: 1986

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Results

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[illegible]

$N = M$ = Nuclear Densometer Measurement t/m^3

2 C. = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
Solid Density is assumed to be = 2.65 t/m³

All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

3 REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Recorded By:

Richard McGee
Laboratory Supervisor
23/10/01

Date: 24-2-05

Approved Signatory:

Hayden Evans
Laboratory Manager

Date: 24-02-25

1-1:

Name: _____

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in accordance



14 Atkins Way Telephone: (07) 544-4418
Ohauiti Rd Facsimile: (07) 544-5568
Tauranga E-mail: hcevans@bop.quik.co.nz

Attention: Mr D Rasmussen

RE : Contract Name:	Lynley Park
Sample Source	On Site
Contract / No.:	Unknown
Quality Control Testing:	Bulk Fill

Test Completion Date:	11/03/2005
Lab Reference:	TGA0007.14 25TL
Report No:	03/05/15/A
Order / Tender No:	N/A
Tested By:	H Evans & T Barnes
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	1881
Date Sampled:	7/03/2005
Date Received:	7/03/2005
Date Reported:	17/03/2005
Sample Condition:	Natural
Page:	1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407:1991

Test 4.2.1

75 4402 : 1986

2.1

House:

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

Test Results

[illegible]

Motex

N.D.M = Nuclear Densometer Measurement t/m^3

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be =

2.65 t/m^3

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

THIS REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor

Date: 17-3-05

Approved Signatory: Date: 17-03-2024

Hayden Evans
Laboratory Manager

Date 23/10/01

Version :

File Name:

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



All tests reported herein have been performed in



14 Atkins Way Telephone: (07) 544-5568
Ohauti Rd Facsimile: hcevans@bop.quik.co.n
Tauranga E-mail: z

Dolph Rassmussen
A & R Contractors Ltd
P O Box 253
Paeroa

Test Completion Date:	23/03/05
Lab Reference:	TGA0007.14 26TL
Report No:	03/05/50/A
Order / Tender No:	N/A
Tested By:	R McGee & T Barnes
Sample By:	Richard McGee
Sample Method:	N/A
Sample No.:	1908
Date Sampled:	17/03/05
Date Received:	17/03/05
Date Reported:	31/03/05
Sample Condition:	Natural
Page:	1 of 1

Attention: Mr D Rassmussen

Contract Name:	Lynley Park
Sample Source	On site
Contract / No.:	Unknown
Quality Control Testing:	Bulk Fill

Client Request

carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

IS 4407 : 1991

ist 4.2.1

NZS 2:1986

15

House:

Test Results

Method of testing and sampling road aggregates

Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Method of testing soils for Civil Engineering purposes

Determination of the water content

Operating procedures for the uses of Geotechnics Torque Head

Test Results

[illegible]

— J.M = Nuclear Densometer Measurement t/m^3

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be =

2.65 V/m^2

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

3 REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

hecked By:

Tracy Barnes
Laboratory Technician

23/10/01

1

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

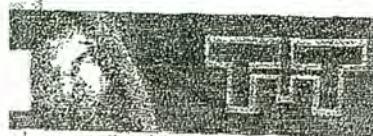
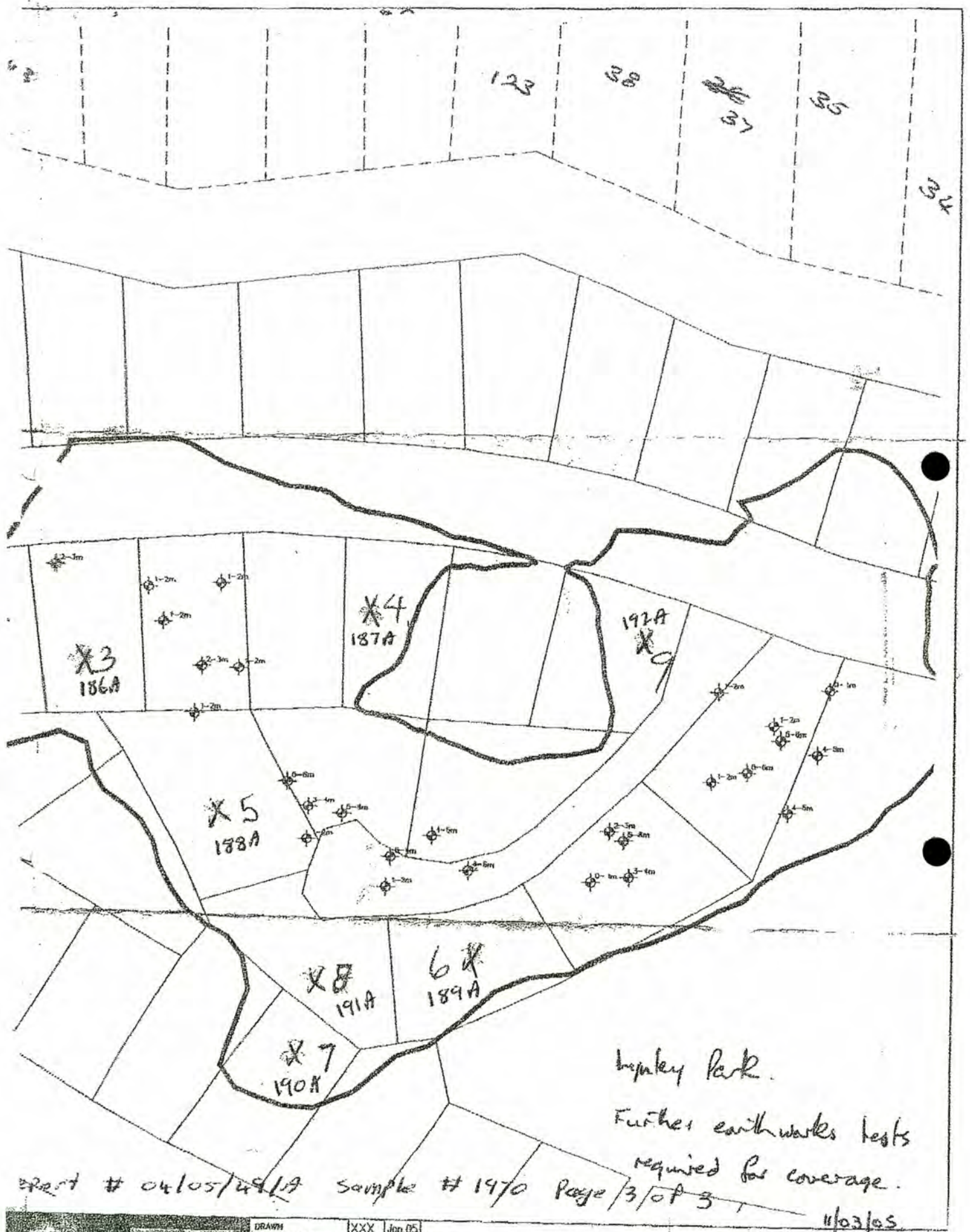
Date: 31-3-2022

Approved Signatory:

Hayden Evans
Laboratory Manager



All tests reported herein have been performed in accordance with the following:



Tonkin & Taylor
Environmental & Engineering Consultants

☒ Auckland
☒ Hamilton
☒ Tauranga
☒ Whangarei
☐ Christchurch
☐ Dunedin

DRAWN	XXX	Jan.05
DRAFTING CHECKED		
APPROVED		
CADFILE		
CADFILE		
SCALES (AT A3 SIZE)		
AS SHOWN		
PROJECT No.		
PROJECT		

FIG. No. Figure 1

CLIENT
PROJECT
LOCATION
Title

REV. 0

**ECES**

Evans Civil Engineering Services Ltd

14 Atkins Way
Ohauiti Rd
TaurangaTelephone:
Facsimile:
E-mail:(07) 544-5568
hcevans@bop.quik.co.
nzDolph Rassmussen
A & R Contractors Ltd
P O Box 253
Paeroa**Attention:** Mr D RassmussenE : Contract Name: Lynley Park
Sample Source On Site
Contract / No.: Unknown
Quality Control Testing: Bulk FillTest Completion Date: 22/04/05
Lab Reference: TGA0007.14 28TL
Report No: 04/05/49/A
Order / Tender No: N/A
Tested By: R McGee & T Barnes
Sample By: Richard McGee
Sample Method: N/A
Sample No.: 1970
Date Sampled: 20/04/05
Date Received: 20/04/05
Date Reported: 22/04/05
Sample Condition: Natural
Page: 1 of 3**Client Request**

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test StandardsZS 4407 : 1991 Method of testing and sampling road aggregates
Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
NZS 4212 : 1986 Method of testing soils for Civil Engineering purposes
Test 1 Determination of the water content
House: Operating procedures for the uses of Geotechnics Torque Head**Test Results**

Test No.	Location Northing	Location Easting	Depth Of Fill	N.D.M Wet Density t/m ³	N.D.M Dry Density t/m ³	N.D.M Water Content %	Oven Water Content %	Corrected Dry Density t/m ³	Total Voids %	Air Voids %	Shear Stress (Kpa)
184A	711655.150	261560.426	Finished Level	1.64	1.05	55.5	51.4	1.08	59.2	3.7	219, 225, 216
5A	711649.674	261594.419	Finished Level	1.76	1.24	42.0	35.8	1.29	51.1	4.8	Refusal
6A	711717.402	261664.114	Finished Level	1.71	1.05	62.5	45.7	1.17	55.7	2.2	160, 167, 162
187A	711758.239	261706.710	Finished Level	1.55	0.97	60.0	53.6	1.01	61.8	7.6	Refusal
188A	711707.561	261704.315	Finished Level	1.78	1.23	43.0	34.1	1.31	50.6	6.0	Refusal
9A	711715.166	261764.297	Finished Level	1.78	1.19	49.5	41.8	1.25	52.7	0.3	Refusal
190A	711675.798	261747.064	Finished Level	1.79	1.23	45.2	39.3	1.28	51.6	1.3	Refusal
91A	711691.008	261740.349	Finished Level	1.79	1.19	50.5	40.7	1.27	52.0	0.2	Refusal
9A	711788.671	261755.344	Finished Level	1.69	1.16	46.1	35.9	1.24	53.1	8.5	Refusal

1 N.D.M = Nuclear Densometer Measurement t/m³

2 Oven = Standard oven method

3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density

4 Solid Density is assumed to be = 2.65 t/m³

5 All Nuclear Densometer Measurements are at the depth of 300mm

6 All test locations were chosen by the contractor.

REPORT MAY ONLY BE REPRODUCED EXCEPT IN FULL

Checked By:

Richard McGee
Laboratory Supervisor

Date: 22-4-05

Approved Signatory:

Hayden Evans
Laboratory Manager

Date: 22-4-05

23/10/01

1

Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

All tests reported
herein have been
performed in accordance

Russell Pemberton
Pemberton Group Ltd
P O Box 5161
Hamilton

Attention: Mr R Pemberton

RE :	Contract Name:	Lynley Park
	Sample Source	Insitu
	Contract / No.:	Unknown
	Quality Control Testing:	Bulk Fill

Test Completion Date:	04/10/06
Lab Reference:	TGA0067.01 47TL
Report No:	09/06/46/A
Order / Tender No:	N/A
Tested By:	H Evans & N Coleman
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	2854
Date Sampled:	27/09/06
Date Received:	27/09/06
Date Reported:	04/10/06
Sample Condition:	Natural
Page:	1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991	Method of testing and sampling road aggregates
Test 4.2.1	Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
NZS 4402 : 1986	Method of testing soils for Civil Engineering purposes
Test 2.1	Determination of the water content
In House:	Operating procedures for the uses of Geotechnics Torque Head

Test Results

[illegible]

Notes

- 1 N.D.M = Nuclear Densometer Measurement t/m^3
- 2 Oven = Standard oven method
- 3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
- 4 Solid Density is assumed to be = $2.65 \text{ } t/m^3$
- 5 All Nuclear Densometer Measurements are at the depth of 300mm
- 6 All test locations were chosen by the contractor.



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.

THIS REPORT MAY ONLY BE REPRODUCED IN FULL

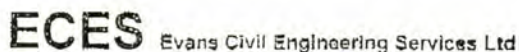
Checked By:  Date: 04-10-00
Hayden Evans
Laboratory Manager

Approved Signatory:  Date: 04-10-06
Hayden Evans
Laboratory Manager

Date 01/02/06

Version : 3

File Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode



14 Atkins Way Telephone: (07) 544-4418
Ohauiti Rd Facsimile: (07) 544-5568
Tauranga

Russell Pemberton
Pemberton Group Ltd
P O Box 5161
Hamilton

Attention: Mr R Pemberton

RE : Contract Name:	Lynley Park
Sample Source	Insitu
Contract / No.:	Unknown
Quality Control Testing:	Bulk Fill

Test Completion Date:	04/10/06
Lab Reference:	TGA0067.01 46TL
Report No:	09/06/45/A
Order / Tender No:	N/A
Tested By:	H Evans & N Coleman
Sample By:	Hayden Evans
Sample Method:	N/A
Sample No.:	2853
Date Sampled:	26/09/06
Date Received:	26/09/06
Date Reported:	04/10/06
Sample Condition:	Natural
Page:	1 of 1

Client Request

To carry out in-situ density tests using Nuclear surface moisture-density gauge, shear stress and laboratory water content determinations on the bulk fill material at Lynley Park

Test Standards

NZS 4407 : 1991	Method of testing and sampling road aggregates
Test 4.2.1	Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode
NZS 4402 : 1986	Method of testing soils for Civil Engineering purposes
Test 2.1	Determination of the water content
In House:	Operating procedures for the uses of Geotechnics Torque Head

Test Results

[illegible]

Notes

- 1 N.D.M = Nuclear Densometer Measurement t/m³
2 Oven = Standard oven method
3 Air Voids & Total Voids are calculated using oven water contents & the corrected dry density
4 Solid Density is assumed to be = 2.65 t/m³
5 All Nuclear Densometer Measurements are at the depth of 300mm
6 All test locations were chosen by the contractor.



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.

THIS REPORT MAY ONLY BE REPRODUCED IN FULL

Checked By: Hayden Evans Date: 04-10-06
Hayden Evans
Laboratory Manager

Approved Signatory:  Date: 04-10-06
Hayden Evans
Laboratory Manager

Date 01/02/06

Version : 3

File Name: Test 4.2.1 Method using a Nuclear Surface Moisture - Density Gauge-Direct Transmission Mode

Appendix D: Earthworks Specification

DURHAM PROPERTY INVESTMENTS LTD

LYNLEY PARK SUBDIVISION

SPECIFICATIONS

Ref: 60619
March 2004

Prepared for: DURHAM PROPERTY INVESTMENTS LTD
Prepared by: Tonkin & Taylor Ltd

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1.0 GENERAL

1.1 Location

The work included in this Contract and to which the Specification and Drawings refer is located at Lynley Park Subdivision, Omokoroa Road, Omokoroa.

1.2 Extent of Contract

The extent of the contract is as shown on the drawings prepared by CKL Ltd.

1.3 Definitions

The following definitions shall apply to this section of the specification only:

Engineer : The owner's representative, Russell Pemberton of Pemberton Group.

Geotechnical Engineer : Tonkin & Taylor Ltd

2.0 BULK EARTHWORKS

2.1 Scope

This Section sets out the requirements for the completion of bulk earthworks. All work shall be carried out in accordance with Transit New Zealand specification F/1 (1997), except where amended by this specification.

In addition, work shall comply with the requirements of the Environment Bay of Plenty Erosion and Sediment Control Guidelines for Earthworks and the conditions of consent for this project in Volume IV of the contract documents.

2.2 General Requirements

2.2.1 Hold Points and Response Times

The Contractor shall give notice to the Engineer for specific points in construction for the purposes of inspection, with the requirements as follows:

- After stripping and prior to placement of fill: minimum of 24 hours notice
- Prior to construction of buried services: a minimum of 24 hours notice
- Backfilling over subsoil drainage: not without written approval of the Engineer

2.2.2 Haul Roads

The Contractor shall construct and maintain all temporary haul roads required to carry out the works. All haul roads shall be located within the site of works. At the completion of the project the Contractor shall rehabilitate haul road areas.

The Contractor shall submit to the Engineer, for his approval, the proposed methodology to gain access to various sections of the site, including any cutting or filling. Temporary haul roads within Structural Fill zones other than those shown on the drawings shall be to the prior approval of the Geotechnical Engineer.

2.3 Topsoil Stripping

All turf and organic topsoil shall be stripped from the areas subject to earthworks before other operations commence in these areas. All topsoil shall be stockpiled for future re-use in the locations shown on the Drawings or areas otherwise approved on site by the Engineer. The stockpiles shall have slopes not steeper than 1V:2H and be rounded to conform generally with the surrounding landscape.

The depth of topsoil stripping shall be sufficient to remove all organic material, turf and significant plant roots. Except where limited by boundaries, existing works or other limiting features, stripping shall extend 2 m beyond the limits of areas subject to earthworks or construction. The Contractor shall co-operate with the Engineer ahead of, and during, stripping operations to determine the stripping depth and shall avoid unnecessary over-excavation.

2.4 Cut Operations

2.4.1 Undercut and Replace

Where shown on the Drawings or where directed by the Geotechnical Engineer, unsuitable material within the fill subgrade shall be undercut to waste and replaced with structural grade filling.

2.4.2 Cut to Waste

If the Contractor deems material not fit for the purposes of cut to fill he is to advise the Engineer. At the Engineers discretion the Contractor shall either, condition then place material as fill or remove material off site.

If instructed by the Engineer, cut material (other than topsoil and that required for fill or backfill) shall be carted to the Principal's nominated dump or removed from site and disposed of. The dumped material shall be track rolled and levelled to the level of the surrounding ground, or as directed.

2.4.3 Cut to Fill

All excavated soils (except organic material) is to be placed as fill within the reclamation.

Prior to compaction, all fill material shall be broken into fragments of less than 100 mm. The material shall be spread uniformly in layers of less than 200 mm thickness, and conditioned to an appropriate water content.

The Contractor shall carry out the cut to fill operation so as to optimise drying of wet cut materials.

Fill shall not be spread over surfaces, which have deteriorated from their specified condition. Where necessary, the old surface shall be scarified, conditioned and re-compacted before placing fill. The Contractor shall exclude all organic matter from fills.

2.5 Fill Placement

2.5.1 General

Prior to compaction, all fill material shall be broken into fragments of less than 100 mm size. The material shall be spread uniformly in layers of less than 200 mm thickness, and conditioned to a water content suitable to achieve the earthfill criteria.

Trafficking and reworking of the fill material shall be minimised at all times, in order to limit strength loss within the sensitive volcanic ash soils.

New fill shall not be spread over surfaces that have deteriorated from their specified condition. Where necessary, the old surface shall be scarified and conditioned and re-compacted before placing new fill. The Contractor shall exclude all organic matter from fills.

2.5.2 Equipment

The Contractor shall employ sufficient compaction equipment to achieve the specified compaction. The number and type of plant necessary shall be confirmed by trials. No subsequent changes shall be introduced without the prior approval of the Engineer.

2.5.3 Control of Water Content

When soil is to be dried the Contractor shall disc the soil and allow it to dry uniformly to its full depth.

When the soil is to be wetted, this shall be done with sprinkling equipment, ensuring uniform and controlled distribution of water in conjunction with blading and discing. Any costs of drying or wetting will be deemed to be included in the fill rate or other scheduled items. No extra payments will be made.

2.6 Fill Operations

The earthworks shall be scheduled to optimise the borrow materials as they become available.

No fill shall be placed on new foundation areas prior to the inspection and approval by the Geotechnical Engineer.

Temporary fill slopes within the fill should be avoided, except at changes in material zoning. The fill should be thoroughly mixed and compacted to ensure the overall fill achieves specified requirements.

If the surface of the existing fill becomes too smooth or too dry to bond to the next lift properly, the fill surface shall be roughened to a depth of at least 75 mm and conditioned for water content as necessary.

Fill shall not be placed over a previous lift that has not achieved specification, or has become contaminated.

Compaction of all material shall be carried out using specialised compaction equipment separate to that used for transportation and spreading.

Fill shall be topsoiled and grassed as soon as possible after reaching the required levels to minimise erosion risk. Repair of any erosion damage shall be to the Engineer's instructions and at no cost to the Principal.

2.7 Compaction Testing

Compaction of non-granular (cohesive) fill obtained from project area cuts shall be measured by the Undrained Shear Strength and Maximum Air Voids.

Compacted fill shall meet the requirements given in Tables 2.6.1 and 2.6.2 before any further filling or topsoil is placed on it.

The testing frequency shall be as defined in Table 2.6.2 below, unless confirmed otherwise in writing by the Engineer.

The specific gravity of solid particles to be used in the air voids test shall be determined at the frequency given in Table 2.6.1. Any adjustment to the fill density/air voids test results shall be subject to prior agreement from the Engineer.

In-situ densities and moisture content measures shall be made with a Nuclear Densometer in accordance with NZS 4407:1991 and the manufacturer's instructions. The Contractor shall adjust moisture content values obtained from the Nuclear Densometer to agree as closely as possible with results obtained from oven dried laboratory samples. All reporting of moisture content shall use laboratory test results.

TABLE 2.6.1 : Compaction Testing

Test	Method	Notes
Vane Shear	NZ Geotechnical Society Guidelines for Hand-held Shear Vane (2002)	The result shall be taken as the mean of at least 4 No. readings within a area of $\geq 0.5\text{m}^2$, located within representative zones of the material being tested.
Water Content	NZS4402	
Dry Density	NZS4402	
Air Voids	NZS4402	
Solid Density	NZS4402	1 test per material type, subject to Geotechnical Engineer's written approval, and provided the nature of the fill remains consistent.

Notes:

- Additional tests should be carried out if the nature of the fill changes, or at the direction of the Engineer.
- Tests shall be accordance with NZS4402 *Methods of Testing Soils for Civil Engineering Purposes*, as appropriate.

TABLE 2.6.2 : Fill Testing Requirements

Fill Type	Test	Min. frequency	Criteria
Structural Fill more than 1.0 m below finished level	Water Content	1 per 2,000 m ³	Minimum = 35 % Maximum = 60 %
	Air Voids	1 per 2,000 m ³	Maximum = 10.0 %
	Undrained Shear Strength	1 per 500 m ³ , reducible to 1 per 1000 m ³	Average result ≥ 115 kPa Any single reading ≥ 110 kPa
Structural Fill less than 1.0 m below finished level	Water Content	1 per 2,000 m ³	Minimum = 35 % Maximum = 60 %
	Air Voids	1 per 1,000 m ³ 1 per 1,000 m ² for filling less than <500 mm thick	Maximum = 8.0 %
	Undrained Shear Strength	1 per 500 m ³	Average result ≥ 125 kPa Any single reading ≥ 115 kPa
Non-structural Fill	Air Voids	1 per 3,000 m ³ provided <1000 mm lifts	Maximum = 14 %
	Undrained Shear Strength	1 per 1,000 m ³ , reducible to 1 per 2000 m ³	Average result ≥ 60 kPa Any single reading ≥ 60 kPa

Notes:

- The frequency of testing will depend on the consistency of fill operations and materials used, and may be varied by the Engineer to obtain sufficient spatial coverage through the depth and extent of the filling.
- Additional tests should be carried out if the nature of the fill changes, or at the direction of the Engineer.
- The Engineer and Contractor shall continue to monitor earthworks operations. Once materials are consistent and work is being carried out in a systematic and consistent manner, the Engineer may vary the frequency of testing.

3.0 SUBSOIL DRAINAGE

3.1 Scope

This Section sets out the requirements for subsoil drainage, including underfill drains.

All work shall be carried out in accordance with Transit New Zealand specification F/6 (2003) "Specification for geotextile wrapped aggregate subsoil drain construction", except where amended by this specification.

3.2 Materials

Subsoil Drainpipes : perforated high density polyethylene (HDPE) pipe of corrugated profile ("Novaflo" or approved equivalent) covered with Filtersok or wrapped in a filter cloth approved by the Engineer. Connection from the subsoil drainage pipe to the specified outlet position shall consist of high density polyethylene (HDPE) pipe of corrugated profile ("Novacoil" or approved equivalent).

Geotextile : Non-woven geotextile fabric of type Bidim A24 or equivalent approved, complying with Transit NZ F/7 specification. No geotextile exhibiting tears, rips, or holes shall be used.

Granular Backfill : shall comprise be clean durable aggregate, nominally GAP40 or an approved equivalent approved by the Engineer. Random checks on the material may be undertaken by the Engineer to ensure the requirements of the grading envelope are being met. Material with more than 5% silt or clay fines will not be accepted. and when wet sieved in accordance with NZS 4402 Part 1: Test 9B, shall comply with the following grading:

Standard Sieve Aperture Size	Percentage Passing
40	100
26.5 mm	90 - 100
13.2 mm	85 - 100
9.3 mm	80 - 95
2.36 mm	50 - 70
1.18 mm	35 - 55
600 µm	18 - 40
300 µm	3 - 25
150 µm	0 - 8
75 µm	0

Materials not specified are to be of the best quality.

All materials shall be stored and handled in accordance with the manufacturer's specifications, and in a manner that fully minimises the risk of damage.

3.3 Trenching and Other Open Excavations

Excavated material shall be stacked at least 600 mm from the edge of the trench. The size of the spoil bank shall be such that there is no danger to the stability of the trench. Avoid blocking any road or footpath.

Surplus material shall be disposed of to the onsite disposal area as directed by the Engineer. Surplus material not cleared by the Contractor may be removed by others at the Contractor's expense to the satisfaction of the Engineer.

The maximum length of open trench may not normally exceed 10 m ahead of pipe laying or such lesser distance as may be determined in view of the nature of the ground. Lengths greater than 10 m may only be open with the approval of the Engineer.

The Contractor shall direct his operations to avoid excavating beyond designated profiles. Any over-excavation beyond these profiles carried out without the direction of the Engineer shall be made good, to the direction of the Engineer, with compacted fill of equal quality to that designated to cover the original excavated profile, at no cost to the Principal.

3.4 Subsoil Drainage Pipe Installation

The Contractor shall not commence laying or bedding until the foundation in the trench has been inspected and approved by the Engineer.

Subsoil drains shall be installed in the location and at the levels shown on the drawings. Trenches shall be trimmed true to grade and line to a width of at least that shown on the drawings and the gradient of the bottom of the trench shall be not less than 1:60. The minimum depth of granular backfilling shall be in accordance with the drawings.

The geotextile shall be placed in the trench so as to conform loosely to the shape of the trench. Care shall be taken to avoid projections which could stretch and damage the geotextile. Longitudinal joints shall be limited to one overlap. Transverse joints shall comprise a splice length of at least 500 mm.

At the uphill end of a subsoil drain the perforated pipe shall be brought up the end of the trench and terminated 1.0 m below ground level. The end of the pipe shall be folded back on itself and tied together.

3.5 Backfilling

Subsoil drains shall be backfilled using GAP40 or an approved equivalent. The upper 0.5 m of each trench shall be backfilled with compacted silt-clay soil from the trench excavation to form a seal against the ingress of surface water. Compaction of the clay seal is to be by tamping with the bucket of the excavation machine and track-rolling with a traxcavator or similar plant. Care shall be taken to not crush the subsoil pipe.

Beneath road carriageways, backfill shall be placed up to the proposed subgrade level. Over the carriageway width the backfill shall be compacted to a depth of 0.5 m below subgrade level using a mechanical wacker or approved equivalent.

3.6 Inspections and Approvals

Before any trench excavation is commenced or fill is placed in any area, the Engineer shall be given sufficient notice prior to commencement so that he or his representative can inspect the excavation material to see that the work undertaken meets the Specification requirements. No excavation or backfilling shall be undertaken in the area until the inspections have been made and the Engineer, after further work has been undertaken by the Contractor as necessary, has approved the commencement of excavation or backfilling works. Periodic inspection may be undertaken by the Engineer or his representative at random intervals during the period of the Contract.

J:\T&T Hamilton jobs\Lynley Park\ajc.60619.Spe.doc

Services As Laid Plan



Western Bay of Plenty
District Council



Owner Name	Consent Number
Edwards	79696
Project Location	
7 Haden Place Omokoroa	
Details – Plumber/Drainlayer	Registration Number
Erin Geraghty	4702

1 Introduction

Tonkin & Taylor Ltd (T&T) has been commissioned by Durham Property Investments Ltd to undertake a ground contamination desk study investigation for the Lynley Park subdivision (referred to below as the site). The location of the site is presented in Figure 1 below.

This report has been prepared in general accordance with the requirements for a PSI (Preliminary Site Investigation) referred to in the NES Soil regulations¹, and as outlined in the MfE's Contaminated Land Management Guidelines².

The persons undertaking, managing reviewing and certifying this investigation are suitably qualified and experienced practitioners as defined in the NES Soil.

This investigation was undertaken in accordance with our proposal of 20 January 2014.

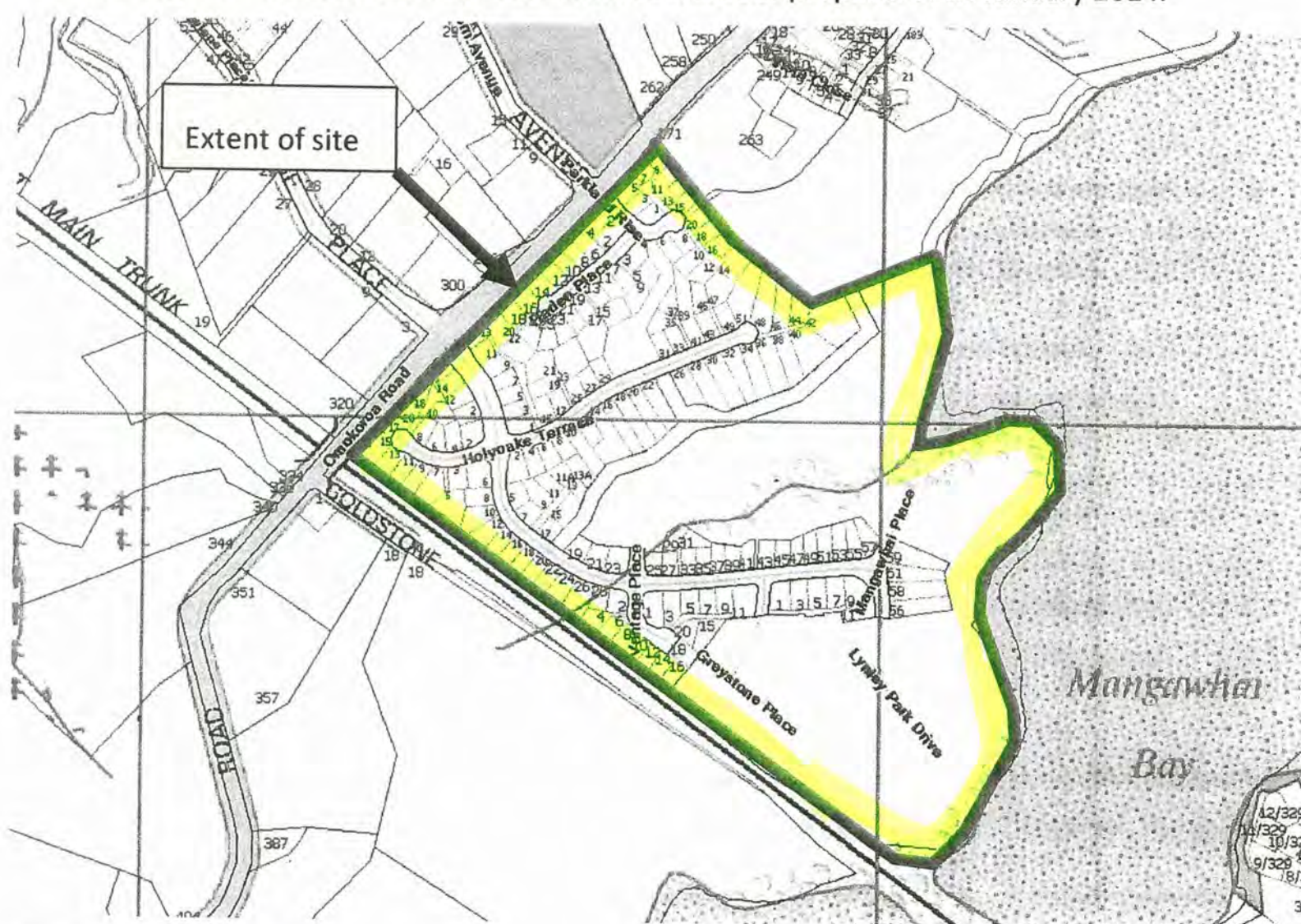


Figure 1: Site location plan

1.1 Background

The Lynley Park subdivision is located off Omokoroa Road, on the Omokoroa peninsula, which has been sequentially subdivided for residential housing since around 2004. The development of the subdivision included extensive earthworks across the entire site to form building platforms. This involved the removal of the topsoil to stockpile and replacing following contouring.

¹ Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

² Ministry for the Environment, updated 2011, Contaminated land management guidelines No. 1: *Reporting on Contaminated Sites in New Zealand*.

REPORT

Durham Property Investments Ltd

Lynley Park Subdivision
Ground Contamination Desk Study
Investigation



Tonkin & Taylor

ENVIRONMENTAL AND ENGINEERING CONSULTANTS



REPORT

Durham Property Investments Ltd

**Lynley Park Subdivision
Ground Contamination Desk Study
Investigation**

Report prepared for:

Durham Property Investments Ltd

Report prepared by:

Tonkin & Taylor Ltd

Distribution:

Durham Property Investments Ltd

2 copies + electronic

Tonkin & Taylor Ltd (FILE)

1 copy

February 2014

T&T Ref: 850895.402



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The Lynley Park subdivision is located off Omokoroa Road, on the Omokoroa peninsula, which has been sequentially subdivided for residential housing since around 2004. The development of the subdivision included extensive earthworks across the entire site to form building platforms. This involved the removal of the topsoil to stockpile and replacing following contouring.

¹ Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

² Ministry for the Environment, updated 2011, Contaminated land management guidelines No. 1: *Reporting on Contaminated Sites in New Zealand*.

We understand that with the NES Soil coming into effect (January 2011) a PSI is required in support of future subdivision applications to the Western Bay of Plenty District Council (WBoPDC) or land use change applications via way of a Building Consent. This requirement is based on the fact that if an activity or industry described in the Ministry for the Environment's (MfE) Hazardous Activities and Industries List (HAIL) is being, or has been, undertaken on a site, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Soil) apply if soil disturbance and/or land development activities take place at the site.

The HAIL is a compilation of activities and industries that are considered to have the potential to cause land contamination resulting from hazardous substance use, storage or disposal. However the list merely indicates that such activities and industries have a greater probability of site contamination occurring than other uses or activities, not that hazardous substances are definitely present in the land.

The NES (Soil) requires that a PSI be undertaken to establish the need for further investigation and consents to support either future subdivision or land use change proposed in continuing development of the Lynley Park subdivision. This PSI has been undertaken in order to confirm the current and historic activities that are occurring or have occurred at the site, and the potential for these activities to have resulted in ground contamination.

1.2 Objective and scope of work

The objective of this investigation is to identify activities at the site that may have resulted in ground contamination, and assess the likelihood, potential magnitude and extent of any contamination as a result of those activities.

The scope of work for this investigation comprised:

- Review of selected historical aerial photographs;
- A site walkover inspection;
- Arrange for the collection of near surface soil samples from across the site in general accordance with Contaminated Land Management Guidelines No.5³. Note that due to the extensive earthworks that have been undertaken, it has been considered appropriate to collect representative soil samples from across the subdivision only.
- Analysis of selected soil samples for a range of potential contaminants.
- Review of ground contamination related environmental regulations and planning documents to identify relevant resource consent requirements ; and
- Preparation of this report.

This report documents our findings and comments on the potential for ground contamination at the site, in the context of the proposed development, including potential resource consent implications with regard to ground contamination.

³ Ministry for the Environment. Updated 2011. Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils.

2 Site description

2.1 Site identification

The site is located off Omokoroa Road on the Omokoroa peninsula, located approximately 2.1 kilometres from State Highway 2. The site is bound by Omokoroa Road to the west, the East Coast Main Trunk Railway to the south and Tauranga Harbour to the North and East. The subdivision has a total area of around 48 hectares, which has now partially been subdivided into residentially lots.

2.2 Site condition

An environmental scientist completed a site walkover inspection on 31 January 2014. Relevant observations made at the time of the inspection are summarised below. Key site features are shown on **Figure 2 in Appendix A**.

The site has partly been developed for a residential subdivision, with the balance being in rank grass and contains the following features:

- The site is accessed via either Lynley Park Drive or Parkland Rise.
- From Omokoroa Road the land rises to a central ridge which is traversed by Holyoake Terrace, being around 20 to 25m above Omokoroa Road.
- The land to the south of the central ridge drops to a relatively level terrace platform with a height of around 25 to 30 m below the central ridge.
- A pond and dam structure is located in the gully between two headlands at the northern extent of the site. The pond is used to treat stormwater from the site prior to discharging it to the Tauranga Harbour.
- The subdivision is fully serviced with wastewater being to a WBoPDC reticulated system.

No unique or special environmental receptors requiring particular attention or protection have been identified on the site during the site walkover.

Likely off site receptors include the fauna and flora communities of adjacent Tauranga Harbour and margins, which receives stormwater and groundwater originating at from the site.

2.3 Surrounding land use

The land surrounding the site is predominately zoned residential under the Western Bay of Plenty District Plan. The surrounding land use includes:

- North: generally conversion of rural land to residential subdivisions along Omokoroa Road, and for the eastern area of the site, the Tauranga Harbour.
- East: Mangawhai Bay, an inlet of the Tauranga Harbour, and then Plumbers Point
- South: The East Coast Main Trunk Railway, and the rural agricultural land use.
- West: generally intensive horticulture with rural residential development and small residential subdivision. The Omokoroa Sports Ground is also located on the western side of Omokoroa Road.

2.4 Geology

The geological strata forming the Omokoroa Peninsula and underlying the majority of the site can be broadly divided into three main units that overlie the ignimbrite basement, which is inferred to underlie the basin into which these units were deposited⁴.

The older of the three units is known as the Matua Subgroup, which comprises an assemblage of terrestrial and estuarine sediments with interbedded ashes that were deposited within an ancient river/estuary system. Sedimentary deposits comprise well sorted gravel and sand deposits, silts and muds together with peat horizons. Many of these deposits are interbedded with volcanic breccias and ashes derived from Rotorua – Taupo volcanism.

Directly overlying these is the deeply weathered clay-rich Hamilton Ash, which blankets much of the Waikato and northern Bay of Plenty Region.

The Rotoehu Ash and other young less weathered ashes constitute the youngest unit. These comprise a sequence of young rhyolitic air fall ashes between 2 and 4 m thick that covers much of the Omokoroa Peninsula.

2.5 Hydrogeology and hydrology

Based on topography, groundwater is expected to occur at around 10 to 20m below ground level and predicted to flow in a north easterly direction towards the Tauranga Harbour.

A historic stream ran in a northerly direction across the southern platform within an incised gully (refer to **Section 3**), discharging to the Tauranga Harbour. The stream is no longer evident and the incised gully has been infilled.

3 Site history

As the site has been extensively modified by way of earthworks associated with the subdivision, which included stockpiling of topsoil, contouring and respreading of topsoil across the site, historical land features including those relating to specific historic land use practices across the site are no longer apparent.

Based on this assessment the site history review has been limited to a review of historical aerial photos only. Historic aerial photographs have been provided by the WBoPDC and a review of Google Earth. Relevant features of the site and surrounds are summarised from each aerial photograph in **Table 1** below. Copies of the aerial photographs are provided in **Appendix B**.

Table 1: Summary of aerial photograph review

Aerial photograph	Key points identified	Surrounding land features
1985 WBoPDC	The site is utilised for agricultural grazing. A residential dwelling and farm buildings appear to be located on the central ridge. A stream is evident within the area of the southern terrace, which is boarded	The surrounding land use is predominately rural, with mixture of intensive horticulture and pastoral grazing. The main east coast railway is evident along the southern boundary of the site. .

⁴ Briggs et al. (1996) The Geology of the Waikato Area. University of Waikato Occasional Report No. 22.

Aerial photograph	Key points identified	Surrounding land features
	by vegetation, extending towards the Tauranga Harbour	
1988 WBoPDC	No observable change from previous	Minor addition dwelling or buildings have been constructed within the surround area.
1993 WBoPDC	No observable change from previous	Minor addition dwelling or buildings have been constructed within the surround area.
2003 Google Earth	No observable change from previous	Additional dwelling or buildings constructed, including higher density residential subdivision neighbouring Omokoroa Road to the north of the site.
2007 Google Earth	Earthworks associated with the development of the Lynley Park subdivision have been undertaken including the filling of the incised valley and construction of the dam and open water pond. Road and dwelling associated with the first stage of the subdivision, adjacent to Omokoroa Road are evident.	Further buildings or dwellings have been constructed in the area surround the site, including higher density residential development to the north and west.
2010 Google Earth	Further residential development has occurred in the subdivision adjacent to Omokoroa Road and along the central crest. Lynley Park Drive has been extended into the southern terrace	Continued residential development in the area surrounding the site.
2012 Google Earth	Further residential development including dwelling being constructed in the area of the southern terrace.	Continued residential development in the area surrounding the site.
2013 Google Earth	Further residential development including dwelling being constructed in the area of the southern terrace.	Continued residential development in the area surrounding the site.

4 Site characterisation

This section characterises the likely and potential contamination status of the site based on the available information as presented in Sections 2 and 3 of this report.

4.1 Potential for contamination

This investigation indicates that no HAIL activities are confirmed, or considered likely to have occurred at the site. Therefore it is considered **highly unlikely that there will be a risk to human health** if the proposed activity is undertaken.

The site however was utilised for agricultural purposes, the activities, potential contaminants and an assessment of the likelihood, potential magnitude and possible extent of contamination are presented in Table 2 below.

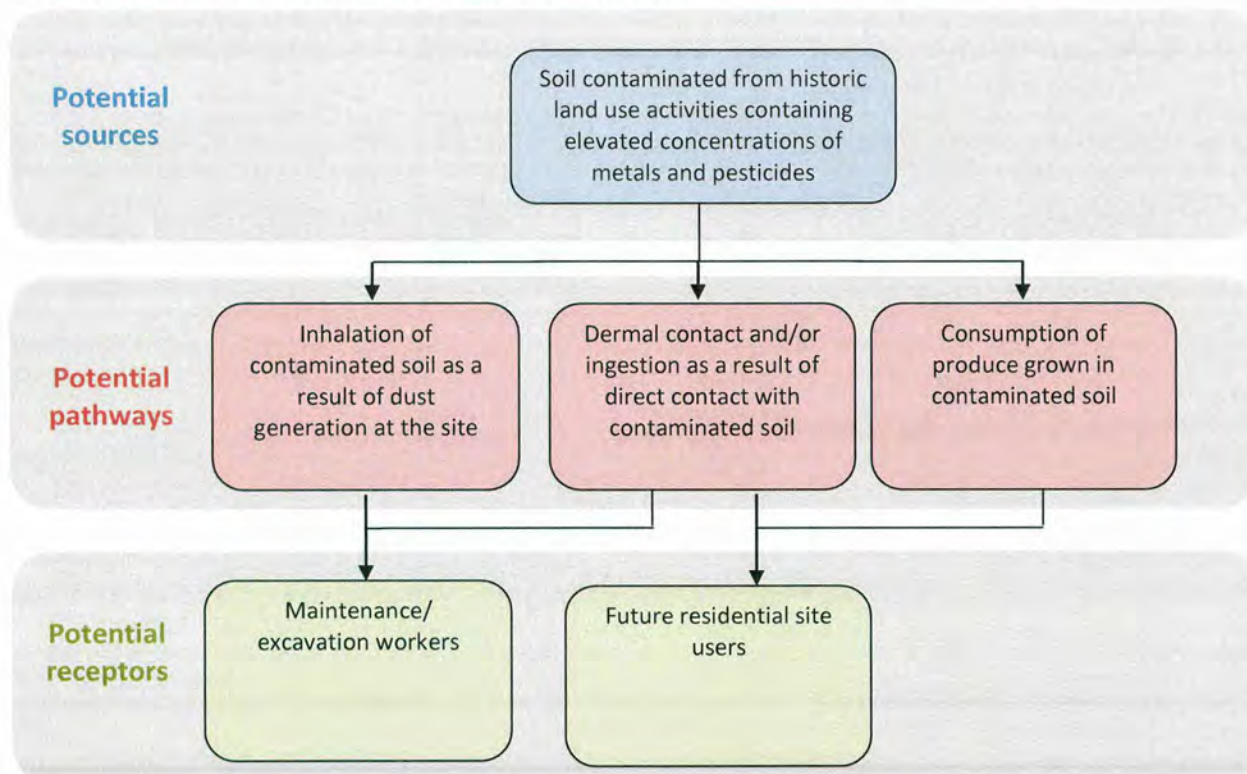
Table 2: Potential for contamination

Land use/activity	Potential contaminants	Likelihood, magnitude and possible extent of contamination	HAIL Activity reference
Spray use for pastoral weed and pest control between 1970 and 1975	Metals (As, Cu, Pb) and organochlorine pesticides (OCPs)	Low concentrations possible in shallow soil (typically to 400mm depth) associated with the use of sprays containing persistent organochlorine compounds used prior to the late 1970s.	No

4.2 Preliminary conceptual site model

A conceptual model as defined by the Ministry for the Environment in the contaminated land management guidelines⁵, sets out known and potential sources of contamination, potential exposure pathways, and potential receptors. For there to be an effect from the proposed activity there has to be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

A preliminary conceptual site model has been developed for the proposed activity which takes into account the available information about the site, and our understanding of the potential effects on human health. The model is presented below.



⁵ Ministry for the Environment, updated 2011, *Contaminated Land Management Guidelines No. 5 Site Investigation and Analysis of Soils*

5 Preliminary site investigation

To determine whether historical activities at the subject area have resulted in ground contamination, a preliminary site investigation was undertaken. The field investigation involved No.15 hand augers (TT01 to TT15) across the subject area. Soil sample locations were generally positioned to provide coverage across the site and areas that have been developed for residential land use versus land that has yet to be developed. The samples locations are graphically shown in **Figure 2**.

The results of the investigation have been used to establish implications for the proposed development works.

5.1 Sampling procedures

Soil samples were collected in general accordance with the MfE Contaminated Land Management Guidelines No.5⁶. Sampling was undertaken according to the following procedure:

- Soil samples were collected directly from the flights of the auger typically at surface (0.0), and 0.3 and 0.5 m depths.
- Freshly gloved hands were used to collect soil samples directly from the auger flights. All samples were placed immediately into laboratory supplied glass jars.
- Any equipment used to collect the samples was decontaminated between sample locations using Decon 90 (a phosphate-free detergent), clean water, and distilled water.
- Samples were shipped in chilled containers to Hill Laboratories, Hamilton under chain of custody documentation.

5.2 Laboratory analysis

As discussed in **Section 4** above, the key potential contaminants at the site are considered to include metals and organo-chlorine and organo-phosphate pesticides that might have been associated with historic land use activities. The results of the preliminary site investigation are summarised in **Table 3** below with full laboratory transcripts included in **Appendix C**.

5.2.1 Assessment criteria

NES (Soil) contaminant standards for 12 priority contaminants were derived and published in the MfE Users' Guide. (April 2012). The NES requires that the *Contaminated Land Management Guideline No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values* be used where a soil contaminant value is not provided. However, the NES does not consider environmental receptors. Accordingly, for consideration of potential effects on the environment, the soil results have been compared against the Interim Environmental Soil Guidelines for the Bay of Plenty region, dated June 2013.

Other guideline documents that have been referenced in this investigation include the NEPC Guideline for the investigation levels for soil and groundwater⁷.

⁶ Ministry for the Environment, 2011: Contaminated Land Management Guideline No. 5 – *Site Investigation and Sampling*,

⁷ National Environmental Protection (Assessment of Site Contamination) Measure 1999, *Schedule B(1) Guideline on the investigation levels for soil and groundwater*. Australian National Environment Protection Council

Table 3: Summary of preliminary site investigation results for selected contaminants (units mg/kg).

	TT01 0.1m	TT02 0.1m	TT02 0.3m	TT03 0.1m	TT04 0.1m	TT05 0.1m	TT06 0.1m	TT07 0.1m	TT08 0.1m	TT09 0.1m	TT10 0.1m	TT12 0.1m	TT13 0.1m	TT15 0.1m	Human health for residential 10% produce	Environmental ⁵
Arsenic	5	5	3	4	5	5	5	5	4	5	5	5	5	5	20 ¹	100
Cadmium	0.3	0.31	< 0.10	0.16	0.26	0.3	0.29	0.21	0.29	0.22	0.22	0.34	0.31	0.25	3 ¹	7.5
Chromium	6	5	10	6	4	6	5	6	5	5	4	5	5	5	460 ^{1,2}	400
Copper	20	22	17	18	23	21	20	19	20	15	26	25	22	22	>10,000 ¹	325
Lead	14.1	13.3	30	17.9	12	13.7	12.8	14.5	13.9	13.8	13.6	14.5	12.4	16	210 ^{1,3}	250
Nickel	2	< 2	3	3	< 2	3	2	2	2	2	2	2	< 2	2	400 ⁴	105
Zinc	64	74	31	60	68	64	64	59	63	55	81	99	74	84	7,400 ⁴	400
4,4'-DDE	0.022	0.014	-	< 0.010	-	0.02	-	< 0.010	0.019	-	< 0.010	< 0.010	0.01	< 0.010	2 ⁶	3 ⁶

Notes:

¹Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment – Guideline values for residential land use 10% produce consumption.

²Assumes Chromium VI

³Assumes inorganic lead.

⁴ National Environment Protection Council, updated 2013, National Environment Protection (Assessment of Site Contamination) Measure 1999 – Residential A land use – standard residential use, including <10% home-grown produce consumption.

⁵Interim Environmental Soil Guidelines for the Bay of Plenty region, dated June 2013.

⁶Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites (US EPA, 20021)

5.3 Results discussion

The key findings of the preliminary site investigation are summarised as follows:

- Concentrations of metals did not exceed the human health guideline level for a residential land use with 10% of total vegetable produce consumption from vegetables grown at the subject site.
- Concentrations of metals did not exceed the interim environmental guideline level provided by the BoPRC.
- Concentrations of 4,4'-DDE pesticides were recorded slightly above the laboratory detection limits for a few sites across the subdivision.
- Concentrations of metals and pesticides can be considered to be within background concentrations for Bay of Plenty soils.

6 Regulatory implications

The rules and associated assessment criteria relating to the management of contaminated sites in the Bay of Plenty region are specified in the following documents:

- NES (Soil);
- The Western Bay of Plenty District Plan (District Plan); and
- Bay of Plenty Regional Water and Land Plan (Regional Plan).

The NES Soil and District Plan consider issues relating to land use and the protection of human health while the Regional Plan has regard to issues relating to the protection of the general environment, including ecological receptors. The need, or otherwise, for contamination related resource consents for the site redevelopment has been evaluated against these regulatory requirements.

6.1 NES Soil

6.1.1 Applicability

The NES Soil came into effect on 1 January 2012. This legislation sets out nationally consistent planning controls appropriate to district and city councils for assessing contaminants in soil with regard to human health. As a result, the NES Soil prevails over the rules in the District Plan, except where the rules permit or restrict effects that are not dealt with in the NES Soil.

The NES Soil applies to specific activities on land where a HAIL activity has, or is more likely than not to have occurred. Activities covered under the NES Soil include soil disturbance, soil sampling, fuel systems removal, subdivision and land use change. The following table (Table 7), as provided in the NES Soil Users Guide (April 2012), confirms the NES Soil does not apply to the site.

Table 7: PSI checklist

NES Soil Requirement	Applicable to site?
Is an activity described on the HAIL currently being undertaken on the piece of land to which this application applies?	<u>No</u>
Has an activity described on the HAIL ever been undertaken on the piece of land to which this application applies?	<u>No</u>
Is it more likely than not that an activity described on HAIL is being or has been undertaken on the piece of land to which this application applies?	<u>No</u>
Conclusion: The NES for Assessing and Managing Contaminants in Soil to Protect Human Health does not apply to the site forming the Lynley Park subdivision. This conclusion is confirmed by the preliminary soil sampling and analysis undertaken which found concentrations of key contaminants within background levels for Bay of Plenty soils.	

6.2 Regional Plan

The Regional Water and Land Plan provides controls around the remediation and disturbance on contaminated sites. Controls are provided in regard to potential discharges, volumes of earthworks that can be undertaken, and information requirements prior to any works being undertaken. In addition to controls regarding the remediation and disturbance of a contaminated site, rules are also provided for any ongoing discharge from a contaminated site where the discharge may be to ground or to water.

Under the provisions of the Regional Water and Land Plan the site does not meet the definition of being contaminated and therefore no consents are required in support of the proposed development.

6.3 District Plan applicability

As noted in **Section 6.1** the NES (Soil) now prevails over the rules in the District Plan, except where the rules permit or restrict effects that are not dealt with in the NES.

The District Plan does not include any rules more restrictive than those set out in the NES (Soil) thus District Plan provisions in relation to contaminated land have not been considered further.

7 Conclusions

A PSI has been undertaken for the site in order to identify what current and historic activities have occurred at the site and assess the potential is for these activities to have resulted in ground contamination. The investigation is in support of either future subdivision or building consent applications to the Western Bay of Plenty District Council.

Based on the findings of the investigation, including the site history review, no current or historic HAIL activities were identified for the site. This is confirmed by the preliminary soil sampling undertaken which found that the concentrations of key contaminants of concern, associated with historic land use practices, to be within background concentrations for Bay of Plenty soils. From the assessment undertaken it is concluded that it is **highly unlikely there will be a risk to human health** as a result of the proposed land use change.

Based on the assessment undertaken the following conclusions are provided:

- The NES Soil does not apply the site forming the Lynley Park subdivision.

- A land use consent from the Western Bay of Plenty District Council under the provisions of the NES Soil is not required.
- The site does not meet the definition of the contaminated site under the provisions of the Bay of Plenty Regional Water and Land Plan.

8 Applicability

This report has been prepared for the benefit of Durham Property Investments Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

The persons undertaking, managing reviewing and certifying this PSI are suitably qualified and experienced practitioners as defined in the NES Soil.

Recommendations and opinions in this report are based on the exploratory holes and testing data. The nature and continuity of subsoil away from the exploratory holes are inferred and it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:



Glen Nicholson

Senior Environmental Scientist



Peter Cochrane

Project Director

p:\850895\850895.4020\issueddocuments\20140227.ggn.lynley park psi.docx

Appendix A: Figures





Aerial photo sourced from Western Bay of Plenty District Council GIS Website

LEGEND

TT Sample Location

A3 SCALE 1:5000
0 50 100 150 200 250 (m)

Tonkin & Taylor
Environmental and Engineering Consultants
Level 1, 525 Cameron Road, Tauranga
www.tonkin.co.nz

DRAWN	AMC	Feb.14
DRAWING CHECKED		
APPROVED		
CAD FILE	\\850895.402_fig2.dwg	
SCALE (AT A3 SIZE)	1:5000	
PROJECT No.	850895.402	

DURHAM PROPERTY INVESTMENTS LTD
LYNLEY PARK SUBDIVISION
OMOKOROA
Sample Location Plan

FIG. No. Figure 2

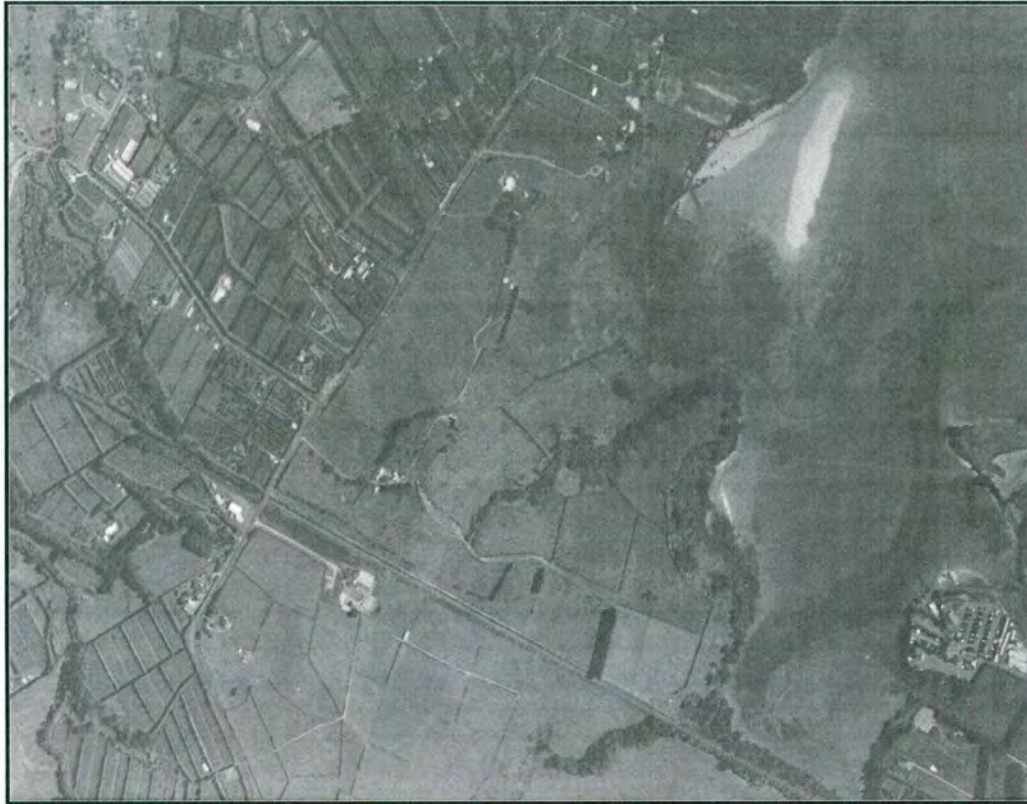
REV. 0



Photograph 1: Lynley Park Subdivision 1985 – sourced from the WBoPDC



Photograph 2: Lynley Park Subdivision 1988 – sourced from the WBoPDC



Photograph 3: Lynley Park Subdivision 1993 – sourced from the WBoPDC



Photograph 4: Lynley Park subdivision 2003 – source from Google Earth



Photograph 5: Lynley Park subdivision 2007 – source from Google Earth



Photograph 6: Lynley Park subdivision 2010 – source from Google Earth



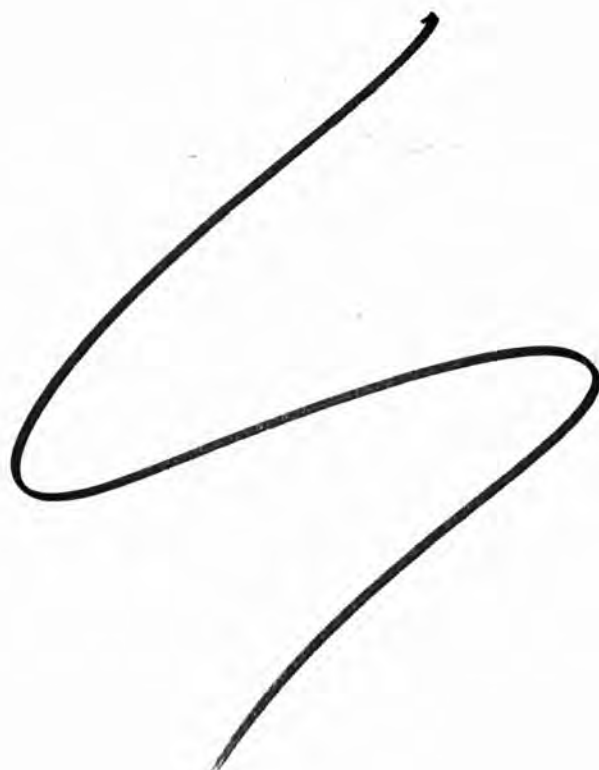
Photograph 7: Lynley Park subdivision 2012 – source from Google Earth



Photograph 8: Lynley Park subdivision 2013 – source from Google Earth

Appendix C:

Analytical transcripts





ANALYSIS REPORT

Page 1 of 9

Client:	Tonkin & Taylor	Lab No:	1228180	SPv2
Contact:	Mr G Nicholson C/- Tonkin & Taylor PO Box 317 TAURANGA 3140	Date Registered:	25-Jan-2014	
		Date Reported:	25-Feb-2014	
		Quote No:		
		Order No:	850895.402	
		Client Reference:	850895.402	
		Submitted By:	Mr G Nicholson	

Amended Report

This report replaces an earlier report issued on the 07 Feb 2014 at 10:59 am
A QC report has been attached at the request of the client.

Sample Type: Soil

Sample Name:		TT01 0.1m	TT02 0.1m	TT02 0.3m	TT03 0.1m	TT04 0.1m
		24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
Lab Number:		1228180.1	1228180.4	1228180.5	1228180.7	1228180.10
Individual Tests						
Dry Matter	g/100g as rcvd	75	70	-	74	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	5	3	4	5
Total Recoverable Cadmium	mg/kg dry wt	0.30	0.31	< 0.10	0.16	0.26
Total Recoverable Chromium	mg/kg dry wt	6	5	10	6	4
Total Recoverable Copper	mg/kg dry wt	20	22	17	18	23
Total Recoverable Lead	mg/kg dry wt	14.1	13.3	30	17.9	12.0
Total Recoverable Nickel	mg/kg dry wt	2	< 2	3	3	< 2
Total Recoverable Zinc	mg/kg dry wt	64	74	31	60	68
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	-	< 0.04	-
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
4,4'-DDE	mg/kg dry wt	0.022	0.014	-	< 0.010	-
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Soil						
Sample Name:		TT01 0.1m 24-Jan-2013	TT02 0.1m 24-Jan-2013	TT02 0.3m 24-Jan-2013	TT03 0.1m 24-Jan-2013	TT04 0.1m 24-Jan-2013
Lab Number:		1228180.1	1228180.4	1228180.5	1228180.7	1228180.10
Organochlorine Pesticides Screening in Soil						
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	-
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Alachlor	mg/kg	< 0.05	< 0.05	-	< 0.05	-
Atrazine	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Atrazine-desethyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Atrazine-desisopropyl	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Azaconazole	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Azinphos-methyl	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Benalaxyl	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Bitertanol	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Bromacil	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Bromopropylate	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Butachlor	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Captan	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Carbaryl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Carbofuran	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Chlorfluazuron	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Chlorothalonil	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Chlorpyrifos	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Chlorpyrifos-methyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Chlortoluron	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Cyanazine	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Cyfluthrin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Cyhalothrin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Cypermethrin	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Deltamethrin (including Tralomethrin)	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Diazinon	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Dichlofluanid	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Dichloran	mg/kg	< 0.2	< 0.2	-	< 0.2	-
Dichlorvos	mg/kg	< 0.09	< 0.09	-	< 0.09	-
Difenoconazole	mg/kg	< 0.09	< 0.10	-	< 0.09	-
Dimethoate	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Diphenylamine	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Diuron	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Fenpropimorph	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Fluazifop-butyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Fluometuron	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Flusilazole	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Fluvalinate	mg/kg	< 0.05	< 0.05	-	< 0.05	-
Furalaxyl	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Haloxifop-methyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Hexaconazole	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Hexazinone	mg/kg	< 0.04	< 0.04	-	< 0.04	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.4	-	< 0.4	-
Kresoxim-methyl	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Linuron	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Malathion	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Methamidophos	mg/kg	< 0.4	< 0.4	-	< 0.4	-
Metolachlor	mg/kg	< 0.05	< 0.05	-	< 0.05	-
Metribuzin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Molinate	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Myclobutanil	mg/kg	< 0.07	< 0.07	-	< 0.07	-

Sample Type: Soil						
Sample Name:		TT01 0.1m 24-Jan-2013	TT02 0.1m 24-Jan-2013	TT02 0.3m 24-Jan-2013	TT03 0.1m 24-Jan-2013	TT04 0.1m 24-Jan-2013
Lab Number:		1228180.1	1228180.4	1228180.5	1228180.7	1228180.10
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Naled	mg/kg	< 0.4	< 0.4	-	< 0.4	-
Norflurazon	mg/kg	< 0.13	< 0.14	-	< 0.13	-
Oxadiazon	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Oxyfluorfen	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Paclobutrazol	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Parathion-ethyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Parathion-methyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Pendimethalin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Permethrin	mg/kg	< 0.03	< 0.03	-	< 0.03	-
Pirimicarb	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Pirimiphos-methyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Prochloraz	mg/kg	< 0.4	< 0.4	-	< 0.4	-
Procymidone	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Prometryn	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Propachlor	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Propanil	mg/kg	< 0.2	< 0.2	-	< 0.2	-
Propazine	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Propiconazole	mg/kg	< 0.05	< 0.05	-	< 0.05	-
Pyriproxyfen	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Quizalofop-ethyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Simazine	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Simetryn	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Sulfentrazone	mg/kg	< 0.4	< 0.4	-	< 0.4	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.13	< 0.14	-	< 0.13	-
Tebuconazole	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Terbacil	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Terbufos	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Terbumeton	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Terbuthylazine	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Terbuthylazine-desethyl	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Terbutryn	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Thiabendazole	mg/kg	< 0.4	< 0.4	-	< 0.4	-
Thiobencarb	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Tolylfluanid	mg/kg	< 0.04	< 0.04	-	< 0.04	-
Triazophos	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Trifluralin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Vinclozolin	mg/kg	< 0.07	< 0.07	-	< 0.07	-
Sample Name:		TT05 0.1m 24-Jan-2013	TT06 0.1m 24-Jan-2013	TT07 0.1m 24-Jan-2013	TT08 0.1m 24-Jan-2013	TT09 0.1m 24-Jan-2013
Lab Number:		1228180.13	1228180.16	1228180.19	1228180.22	1228180.25
Individual Tests						
Dry Matter	g/100g as rcvd	73	-	72	77	-
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	5	5	5	4	5
Total Recoverable Cadmium	mg/kg dry wt	0.30	0.29	0.21	0.29	0.22
Total Recoverable Chromium	mg/kg dry wt	6	5	6	5	5
Total Recoverable Copper	mg/kg dry wt	21	20	19	20	15
Total Recoverable Lead	mg/kg dry wt	13.7	12.8	14.5	13.9	13.8
Total Recoverable Nickel	mg/kg dry wt	3	2	2	2	2
Total Recoverable Zinc	mg/kg dry wt	64	64	59	63	55
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
alpha-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
beta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-

Sample Type: Soil						
Sample Name:		TT05 0.1m 24-Jan-2013	TT06 0.1m 24-Jan-2013	TT07 0.1m 24-Jan-2013	TT08 0.1m 24-Jan-2013	TT09 0.1m 24-Jan-2013
Lab Number:		1228180.13	1228180.16	1228180.19	1228180.22	1228180.25
Organochlorine Pesticides Screening in Soil						
delta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
cis-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
trans-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	-
2,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
4,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
2,4'-DDE	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
4,4'-DDE	mg/kg dry wt	0.020	-	< 0.010	0.019	-
2,4'-DDT	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
4,4'-DDT	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Dieldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endosulfan I	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endosulfan II	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endosulfan sulphate	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endrin aldehyde	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Endrin ketone	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Heptachlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Heptachlor epoxide	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Hexachlorobenzene	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Methoxychlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	-
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Alachlor	mg/kg	< 0.05	-	< 0.05	< 0.05	-
Atrazine	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Atrazine-desethyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Atrazine-desisopropyl	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Azaconazole	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Azinphos-methyl	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Benalaxyl	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Bitertanol	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Bromacil	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Bromopropylate	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Butachlor	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Captan	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Carbaryl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Carbofuran	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Chlorfluazuron	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Chlorothalonil	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Chlorpyrifos	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Chlorpyrifos-methyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Chlortoluron	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Cyanazine	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Cyfluthrin	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Cyhalothrin	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Cypermethrin	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Deltamethrin (including Tralomethrin)	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Diazinon	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Dichlofluanid	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Dichloran	mg/kg	< 0.2	-	< 0.2	< 0.2	-
Dichlorvos	mg/kg	< 0.09	-	< 0.09	< 0.09	-
Difenoconazole	mg/kg	< 0.10	-	< 0.10	< 0.09	-
Dimethoate	mg/kg	< 0.13	-	< 0.14	< 0.13	-

Sample Type: Soil						
Sample Name:		TT05 0.1m 24-Jan-2013	TT06 0.1m 24-Jan-2013	TT07 0.1m 24-Jan-2013	TT08 0.1m 24-Jan-2013	TT09 0.1m 24-Jan-2013
Lab Number:		1228180.13	1228180.16	1228180.19	1228180.22	1228180.25
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Diphenylamine	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Diuron	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Fenpropimorph	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Fluazifop-butyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Fluometuron	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Flusilazole	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Fluvalinate	mg/kg	< 0.05	-	< 0.05	< 0.05	-
Furalaxyl	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Haloxifop-methyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Hexaconazole	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Hexazinone	mg/kg	< 0.04	-	< 0.04	< 0.04	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	-	< 0.4	< 0.4	-
Kresoxim-methyl	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Linuron	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Malathion	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Methamidophos	mg/kg	< 0.4	-	< 0.4	< 0.4	-
Metolachlor	mg/kg	< 0.05	-	< 0.05	< 0.05	-
Metribuzin	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Molinate	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Myclobutanil	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Naled	mg/kg	< 0.4	-	< 0.4	< 0.4	-
Norflurazon	mg/kg	< 0.13	-	< 0.14	< 0.13	-
Oxadiazon	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Oxyfluorfen	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Paclobutrazol	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Parathion-ethyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Parathion-methyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Pendimethalin	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Permethrin	mg/kg	< 0.03	-	< 0.03	< 0.03	-
Pirimicarb	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Pirimiphos-methyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Prochloraz	mg/kg	< 0.4	-	< 0.4	< 0.4	-
Procymidone	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Prometryn	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Propachlor	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Propanil	mg/kg	< 0.2	-	< 0.2	< 0.2	-
Propazine	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Propiconazole	mg/kg	< 0.05	-	< 0.05	< 0.05	-
Pyriproxyfen	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Quizalofop-ethyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Simazine	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Simetryn	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Sulfentrazone	mg/kg	< 0.4	-	< 0.4	< 0.4	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.13	-	< 0.14	< 0.13	-
Tebuconazole	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Terbacil	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Terbufos	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Terbumeton	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Terbuthylazine	mg/kg	< 0.04	-	< 0.04	< 0.04	-
Terbuthylazine-desethyl	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Terbutryn	mg/kg	< 0.07	-	< 0.07	< 0.07	-
Thiabendazole	mg/kg	< 0.4	-	< 0.4	< 0.4	-
Thiobencarb	mg/kg	< 0.07	-	< 0.07	< 0.07	-

Sample Type: Soil					
Sample Name:		TT05 0.1m 24-Jan-2013	TT06 0.1m 24-Jan-2013	TT07 0.1m 24-Jan-2013	TT08 0.1m 24-Jan-2013
Lab Number:		1228180.13	1228180.16	1228180.19	1228180.22
Organonitro&phosphorus Pesticides Screen in Soil by GCMS					
Tolyfluanid	mg/kg	< 0.04	-	< 0.04	< 0.04
Triazophos	mg/kg	< 0.07	-	< 0.07	< 0.07
Trifluralin	mg/kg	< 0.07	-	< 0.07	< 0.07
Vinclozolin	mg/kg	< 0.07	-	< 0.07	< 0.07
Sample Name:		TT10 0.1m 24-Jan-2013	TT12 0.1m 24-Jan-2013	TT13 0.1m 24-Jan-2013	TT15 0.1m 24-Jan-2013
Lab Number:		1228180.28	1228180.34	1228180.37	1228180.43
Individual Tests					
Dry Matter	g/100g as rcvd	67	68	73	70
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn					
Total Recoverable Arsenic	mg/kg dry wt	5	5	5	5
Total Recoverable Cadmium	mg/kg dry wt	0.22	0.34	0.31	0.25
Total Recoverable Chromium	mg/kg dry wt	4	5	5	5
Total Recoverable Copper	mg/kg dry wt	26	25	22	22
Total Recoverable Lead	mg/kg dry wt	13.6	14.5	12.4	16.0
Total Recoverable Nickel	mg/kg dry wt	2	2	< 2	2
Total Recoverable Zinc	mg/kg dry wt	81	99	74	84
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	0.010	< 0.010
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010
Organonitro&phosphorus Pesticides Screen in Soil by GCMS					
Acetochlor	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07
Alachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Atrazine	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07
Atrazine-desethyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07
Atrazine-desisopropyl	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14
Azaconazole	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04
Azinphos-methyl	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14
Benalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04
Bitertanol	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14
Bromacil	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07

Sample Type: Soil						
Sample Name:		TT10 0.1m 24-Jan-2013	TT12 0.1m 24-Jan-2013	TT13 0.1m 24-Jan-2013	TT15 0.1m 24-Jan-2013	
Lab Number:		1228180.28	1228180.34	1228180.37	1228180.43	
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Bromopropylate	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Butachlor	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Captan	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Carbaryl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Carbofuran	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Chlorfluazuron	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Chlorothalonil	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Chlorpyrifos	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Chlorpyrifos-methyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Chlortoluron	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Cyanazine	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Cyfluthrin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Cyhalothrin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Cypermethrin	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Deltamethrin (including Tralomethrin)	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Diazinon	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Dichlofluanid	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Dichloran	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	-
Dichlorvos	mg/kg	< 0.09	< 0.09	< 0.09	< 0.09	-
Difenoconazole	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	-
Dimethoate	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Diphenylamine	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Diuron	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Fenpropimorph	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Fluazifop-butyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Fluometuron	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Flusilazole	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Fluvalinate	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	-
Furalaxyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Haloxypop-methyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Hexaconazole	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Hexazinone	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	< 0.4	< 0.4	< 0.4	< 0.4	-
Kresoxim-methyl	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Linuron	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Malathion	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Metalaxyl (Mefenoxam)	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Methamidophos	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Metolachlor	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	-
Metribuzin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Molinate	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Myclobutanil	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Naled	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Norflurazon	mg/kg	< 0.15	< 0.14	< 0.13	< 0.14	-
Oxadiazon	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Oxyfluorfen	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Paclobutrazol	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Parathion-ethyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Parathion-methyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Pendimethalin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Permethrin	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	-
Pirimicarb	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Pirimiphos-methyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Prochloraz	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-

Sample Type: Soil						
Sample Name:		TT10 0.1m 24-Jan-2013	TT12 0.1m 24-Jan-2013	TT13 0.1m 24-Jan-2013	TT15 0.1m 24-Jan-2013	
Lab Number:		1228180.28	1228180.34	1228180.37	1228180.43	
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Procymidone	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Prometryn	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Propachlor	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Propanil	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2	-
Propazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Propiconazole	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	-
Pyriproxyfen	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Quizalofop-ethyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Simazine	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Simetryn	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Sulfentrazone	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	mg/kg dry wt	< 0.15	< 0.14	< 0.13	< 0.14	-
Tebuconazole	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Terbacil	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Terbufos	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Terbumeton	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Terbuthylazine	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Terbuthylazine-desethyl	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Terbutryn	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Thiabendazole	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	-
Thiobencarb	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Tolylfluanid	mg/kg	< 0.04	< 0.04	< 0.04	< 0.04	-
Triazophos	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Trifluralin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-
Vinclozolin	mg/kg	< 0.08	< 0.07	< 0.07	< 0.07	-

Analyst's Comments

It has been noted that the method performance for Iprodione for ONOP analysis is not acceptable therefore we are unable to report this compound at this present time.

Appendix No.1 - QC report

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 4-5, 7, 10, 13, 16, 19, 22, 25, 28, 34, 37, 43
Heavy metal screen level As, Cd, Cr, Cu, Ni, Pb, Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	1, 4-5, 7, 10, 13, 16, 19, 22, 25, 28, 34, 37, 43
Organochlorine/nitro&phosphorus Pests Screen in Soils, GCMS	Sonication extraction, Dilution cleanup, GC-MS analysis. Tested on as received sample	-	1, 4, 7, 13, 19, 22, 28, 34, 37, 43
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry), gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1, 4, 7, 13, 19, 22, 28, 34, 37, 43
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 4-5, 7, 10, 13, 16, 19, 22, 25, 28, 34, 37, 43

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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A handwritten signature in blue ink, appearing to read 'G Corban', is positioned above the printed name.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental Division



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QUALITY CONTROL REPORT

Page 1 of 7

Client:	Tonkin & Taylor	Lab No:	1228180
Contact:	Glen Nicholson	Date Registered:	25-Jan-2014
	c/o Tonkin & Taylor	Date Reported:	
	PO Box 317	Quote No:	
	TAURANGA 3140	Order No:	850895.402
		Client Reference:	850895.402
		Submitted By:	Glen Nicholson

This report includes quality control data for the following analytes:

Sample Type: Soil	
Metals – As, Cd, Cr, Cu, Pb, Ni, Zn	Procedural Blank results Quality Control (QC) standard results Matrix replicates
Organochlorine Pesticides (OCP)	Procedural Blank results System Monitoring Compound (SMC) Recoveries Matrix and Control Spike Recoveries
Organonitro&phosphorus Pesticides (ONP)	Procedural Blank results System Monitoring Compound (SMC) Recoveries Matrix and Control Spike Recoveries

Metal Blanks			
	dig3008blk1	dig3008blk2	Acceptance Range
Units	(mg/kg/dry wt)	(mg/kg/dry wt)	(mg/kg/dry wt)
Total Recoverable Arsenic	<2	<2	-2 – 2
Total Recoverable Cadmium	<0.1	<0.1	-0.1 – 0.1
Total Recoverable Chromium	<2	<2	-2 – 2
Total Recoverable Copper	<2	<2	-2 – 2
Total Recoverable Lead	<0.4	<0.4	-0.4 – 0.4
Total Recoverable Nickel	<2	<2	-2 – 2
Total Recoverable Zinc	<4	<4	-4 – 4

Metal CRM recoveries		
	Agal10 QC	Acceptance Range
Units	(mg/kg/dry wt)	(mg/kg/dry wt)
Total Recoverable Arsenic	17.8	14.0 – 21.4
Total Recoverable Cadmium	9.8	8.5 – 10.9
Total Recoverable Chromium	45.8	37.3 – 57.6
Total Recoverable Copper	24.0	20.3 – 28.2
Total Recoverable Lead	43.7	38.4 – 48.7
Total Recoverable Nickel	11.4	8.9 – 13.7
Total Recoverable Zinc	58.0	49.7 – 65.2

Metal Replicates		
Lab No	1228180.43	1228180.43R
Units	(mg/kg/dry wt)	(mg/kg/dry wt)
Total Recoverable Arsenic	5.2	5.1
Total Recoverable Cadmium	0.25	0.24
Total Recoverable Chromium	5.4	5.2
Total Recoverable Copper	21.7	20.2
Total Recoverable Lead	16.0	15.2
Total Recoverable Nickel	2.4	2.4
Total Recoverable Zinc	84.5	78.9

OCP Blank		
Lab No	ext1270blk1	Acceptance Range
Units	(mg/kg/dry wt)	(mg/kg/dry wt)
Aldrin	<0.01	0 – 0.01
alpha-BHC	<0.01	0 – 0.01
beta-BHC	<0.01	0 – 0.01
delta-BHC	<0.01	0 – 0.01
gamma-BHC (Lindane)	<0.01	0 – 0.01
cis-Chlordane	<0.01	0 – 0.01
trans-Chlordane	<0.01	0 – 0.01
Total Chlordane [(cis+trans)*100/42]	<0.04	0 – 0.01
2,4'-DDD	<0.01	0 – 0.01
4,4'-DDD	<0.01	0 – 0.01
2,4'-DDE	<0.01	0 – 0.01
4,4'-DDE	<0.01	0 – 0.01
2,4'-DDT	<0.01	0 – 0.01
4,4'-DDT	<0.01	0 – 0.01
Dieldrin	<0.01	0 – 0.01

Lab No	ext1270blk1	Acceptance Range
Endosulfan I	<0.01	0 – 0.01
Endosulfan II	<0.01	0 – 0.01
Endosulfan sulphate	<0.01	0 – 0.01
Endrin	<0.01	0 – 0.01
Endrin aldehyde	<0.01	0 – 0.01
Endrin ketone	<0.01	0 – 0.01
Heptachlor	<0.01	0 – 0.01
Heptachlor epoxide	<0.01	0 – 0.01
Hexachlorobenzene	<0.01	0 – 0.01
Methoxychlor	<0.01	0 – 0.01

OCP SMCs					
Lab No	1228180.1	1228180.4	1228180.7	1228180.13	Acceptance Range
Units	(%)	(%)	(%)	(%)	(%)
2,4,5,6-tetrachloro-m-xylene (TCMX)	78	79	78	87	40 - 120
3-bromobiphenyl (3-BBP)	90	88	79	94	40 - 120

OCP SMCs					
Lab No	1228180.19	1228180.22	1228180.28	1228180.34	Acceptance Range
Units	(%)	(%)	(%)	(%)	(%)
2,4,5,6-tetrachloro-m-xylene (TCMX)	84	84	85	83	40 - 120
3-bromobiphenyl (3-BBP)	90	93	98	87	40 - 120

OCP SMCs			
Lab No	1228180.37	1228180.43	Acceptance Range
Units	(%)	(%)	(%)
2,4,5,6-tetrachloro-m-xylene (TCMX)	81	87	40 - 120
3-bromobiphenyl (3-BBP)	94	90	40 - 120

OCP Spike recoveries [†]				
Lab No	1228886.9s	1228886.9sd	1228886.9lcs	Acceptance Range
Units	(%)	(%)	(%)	(%)
Aldrin	95	98	128	60 - 140
alpha-BHC	101	102	123	60 - 140
beta-BHC	93	94	106	60 - 140
delta-BHC	105	102	116	60 - 140
gamma-BHC (Lindane)	106	105	122	60 - 140
cis-Chlordane	118	120	138	60 - 140
trans-Chlordane	94	96	108	60 - 140
2,4'-DDD	94	97	107	60 - 140
4,4'-DDD	104	121	123	60 - 140
2,4'-DDE	97	98	109	60 - 140

Lab No	1228886.9s	1228886.9sd	1228886.9lcs	Acceptance Range
4,4'-DDE	68	107	132	60 - 140
2,4'-DDT	115	112	128	60 - 140
4,4'-DDT	115	94	136	60 - 140
Dieldrin	120	121	137	60 - 140
Endosulfan I	121	122	141 ^{#2}	60 - 140
Endosulfan II	110	110	127	60 - 140
Endosulfan sulphate	126	128	143 ^{#2}	60 - 140
Endrin	118	120	136	60 - 140
Endrin aldehyde	94	95	88	60 - 140
Endrin ketone	100	113	114	60 - 140
Heptachlor	128	127	140	60 - 140
Heptachlor epoxide	126	126	141 ^{#2}	60 - 140
Hexachlorobenzene	80	91	85	60 - 140
Methoxychlor	124	116	128	60 - 140

^{#1}No duplicate sample was spiked for this job. The data presented is that of a job on the same batch of samples.

^{#2}Elevated recoveries outside acceptance range, data approved as no positive results for those compounds in the samples.

ONP Blank		
Lab No	ext824blk1	Acceptance Range
Units	(mg/kg/dry wt)	(mg/kg/dry wt)
Acetochlor	<0.07	0 – 0.07
Alachlor	<0.05	0 – 0.05
Atrazine	<0.07	0 – 0.07
Atrazine-desethyl	<0.07	0 – 0.07
Atrazine-desisopropyl	<0.14	0 – 0.14
Azaconazole	<0.04	0 – 0.04
Azinphos-methyl	<0.14	0 – 0.14
Benalaxyl	<0.04	0 – 0.04
Bitertanol	<0.14	0 – 0.14
Bromacil	<0.07	0 – 0.07
Bromopropylate	<0.07	0 – 0.07
Butachlor	<0.07	0 – 0.07
Captan	<0.14	0 – 0.14
Carbaryl	<0.07	0 – 0.07
Carbofuran	<0.07	0 – 0.07
Chlorfluazuron	<0.07	0 – 0.07
Chlorothalonil	<0.07	0 – 0.07
Chlorpyrifos	<0.07	0 – 0.07
Chlorpyrifos-methyl	<0.07	0 – 0.07
Chlortoluron	<0.14	0 – 0.14
Cyanazine	<0.07	0 – 0.07
Cyfluthrin	<0.07	0 – 0.07
Cyhalothrin	<0.07	0 – 0.07
Cypermethrin	<0.14	0 – 0.14
Deltamethrin (Tralomethrin)	<0.07	0 – 0.07
Diazinon	<0.04	0 – 0.04
Dichlofluanid	<0.07	0 – 0.07

Lab No	ext824blk1	Acceptance Range
Dichloran	<0.2	0 – 0.2
Dichlorvos	<0.09	0 – 0.09
Difenoconazole	<0.10	0 – 0.10
Dimethoate	<0.14	0 – 0.14
Diphenylamine	<0.14	0 – 0.14
Diuron	<0.07	0 – 0.07
Fenpropimorph	<0.07	0 – 0.07
Fluazifop-butyl	<0.07	0 – 0.07
Fluometuron	<0.07	0 – 0.07
Flusilazole	<0.07	0 – 0.07
Fluvalinate	<0.05	0 – 0.05
Furalaxyl	<0.04	0 – 0.04
Haloxifop-methyl	<0.07	0 – 0.07
Hexaconazole	<0.07	0 – 0.07
Hexazinone	<0.04	0 – 0.04
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	<0.4	0 – 0.4
Kresoxim-methyl	<0.04	0 – 0.04
Linuron	<0.07	0 – 0.07
Malathion	<0.07	0 – 0.07
Metalaxyl (Mefenoxam)	<0.07	0 – 0.07
Methamidophos	<0.4	0 – 0.4
Metolachlor	<0.05	0 – 0.05
Metribuzin	<0.07	0 – 0.07
Molinate	<0.14	0 – 0.14
Myclobutanil	<0.07	0 – 0.07
Naled	<0.4	0 – 0.4
Norflurazon	<0.14	0 – 0.14
Oxadiazon	<0.07	0 – 0.07
Oxyfluorfen	<0.04	0 – 0.04
Paclobutrazol	<0.07	0 – 0.07
Parathion-ethyl	<0.07	0 – 0.07
Parathion-methyl	<0.07	0 – 0.07
Pendimethalin	<0.07	0 – 0.07
Permethrin	<0.03	0 – 0.03
Pirimicarb	<0.07	0 – 0.07
Pirimiphos-methyl	<0.07	0 – 0.07
Prochloraz	<0.4	0 – 0.4
Procymidone	<0.07	0 – 0.07
Prometryn	<0.04	0 – 0.04
Propachlor	<0.07	0 – 0.07
Propanil	<0.2	0 – 0.2
Propazine	<0.04	0 – 0.04
Propiconazole	<0.05	0 – 0.05
Pyriproxyfen	<0.07	0 – 0.07
Quinalofop-ethyl	<0.07	0 – 0.07
Simazine	<0.07	0 – 0.07

Lab No	ext824blk1	Acceptance Range
Simetryn	<0.07	0 – 0.07
Sulfentrazone	<0.4	0 – 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	<0.14	0 – 0.14
Tebuconazole	<0.07	0 – 0.07
Terbacil	<0.07	0 – 0.07
Terbufos	<0.07	0 – 0.07
Terbumeton	<0.07	0 – 0.07
Terbuthylazine	<0.04	0 – 0.04
Terbuthylazine-desethyl	<0.07	0 – 0.07
Terbutryn	<0.07	0 – 0.07
Thiabendazole	<0.4	0 – 0.4
Thiobencarb	<0.07	0 – 0.07
Tolylfluanid	<0.04	0 – 0.04
Triazophos	<0.07	0 – 0.07
Trifluralin	<0.07	0 – 0.07
Vinclozolin	<0.07	0 – 0.07

ONP SMCs					
Lab No	1228180.1	1228180.4	1228180.7	1228180.13	Acceptance Range
Units	(%)	(%)	(%)	(%)	(%)
Triphenylphosphate	103	102	100	108	40 - 120

ONP SMCs					
Lab No	1228180.19	1228180.22	1228180.28	1228180.34	Acceptance Range
Units	(%)	(%)	(%)	(%)	(%)
Triphenylphosphate	104	107	89	103	40 - 120

ONP SMCs			
Lab No	1228180.37	1228180.43	Acceptance Range
Units	(%)	(%)	(%)
Triphenylphosphate	113	118	40 - 120

ONP Spike recoveries ^{#1}				
Lab No	1226396.74s	1226396.74sd	1226396.74lcs	Acceptance Range
Units	(%)	(%)	(%)	(%)
Acetochlor	50	65	90	40 - 120
Cyanazine	41	55	84	40 - 120
Dichlorvos	35 ^{#3}	47	68	40 - 120
Fluvalinate	55	71	71	40 - 120
Furalaxyl	50	64	90	40 - 120
Hexaconazole	60	71	70	40 - 120
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	30	35	33	30 - 110
Pyriproxyfen	35 ^{#3}	45	69	40 - 120
TCMTB [2-(thiocyanomethylthio)benzothiazole, Busan]	23 ^{#3}	29 ^{#3}	44	40 - 120
Terbufos	212 ^{#2}	246 ^{#2}	307 ^{#2}	40 - 120
Thiobencarb	48	62	91	40 - 120

Note that only a selected mix of ONP compounds are spiked on the samples.

^{#1}No duplicate sample was spiked for this job. The data presented is that of a job on the same batch of samples.

^{#2}Recoveries outside acceptance range. Data approved as no positive results for those compounds in the samples.

^{#3}Recoveries outside acceptance range. Data approved as the laboratory control spike (LCS) was acceptable, indicating a sample matrix issue.



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