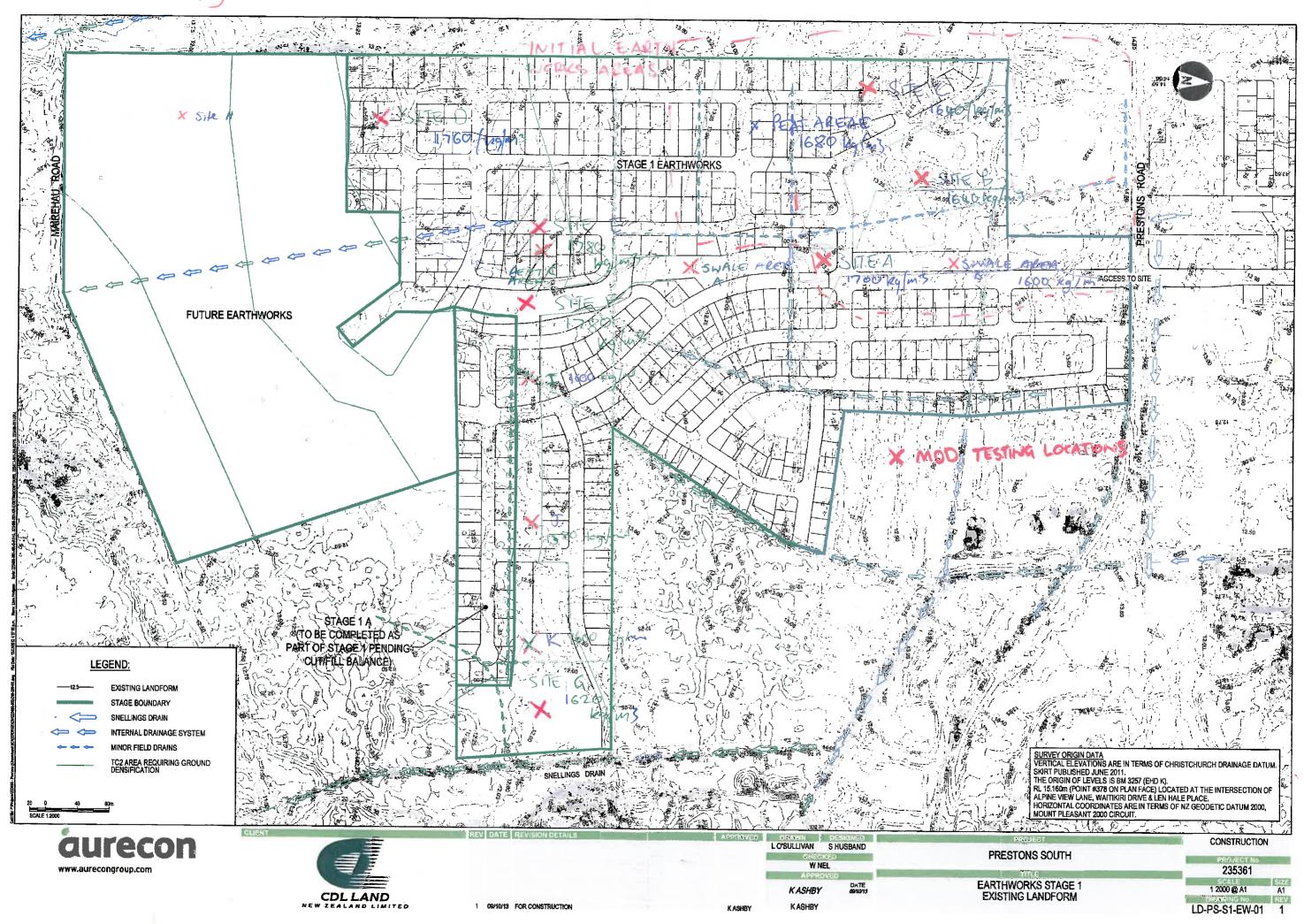
# Appendix G Compaction Curves

Mouster copy





#### CHRISTCHURCH LABORATORY

397 Maleans Island Road: Harewood P O Box 11-326, Sockburn, Christchurch 8443 Phone: (03) 359-0752, Fax (03) 359-1909

11:00

Replacement

Page 1 of 1

11-Oct-2013

18-Oct-2013

C13/2221

158619

Declan McGowan

#### **Test Report**

Sample Date:

Laboratory No:

Sampled By:

Report No:

Report Date:

Client:

K.B. Contracting & Quarries Limited

Address:

PO Box 19746, Woolston, Christchurch 8241

Client Ref: Job Location: Not Advised

Material:

**New Quarry** 

**Material Source:** 

Pit run

This report supersedes and replaces Report No: 158610

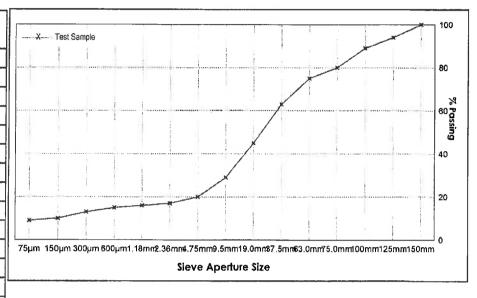
KB's Quarries McLeans Island

**Test Methods:** 

1 The Particle-Size Distribution - Preferred Method by Wet Sieving

NZ\$ 4407:1991 Test 3.8.1

Sieve Size (BSS)	Percent passing	Specification
125mm	94	
100mm	89	
75.0mm	80	
63.0mm	75	
37.5mm	63	
19.0mm	45	
9.5mm	29	
4.75mm	20	
2.36mm	17	
1.18mm	16	
600µm	15	
300µm	13	
1 <i>5</i> 0μm	10	
75µm	9	



Test Date:

14/10/2013

#### Notes

Test results apply to sample as received.

Percent passing finest sieve obtained by difference.

Sample received in a damp condition.

Date of sample receipt:

11-Oct-13

Craig Kelly **Approved Signatory Laboratory Technician** IANZ Accreditation No: 439 Date of Issue: 10/04/92

C. Kelly



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full.

Doc: WI-LIMS-92

Issue Date: 12/7/13

Issue No: 4



325 Pound Rd, Yaldhurst, Christchurch PO Box 16-064, Christchurch 8441 Telephone: +64.3.349.9142

Report No: MDD:CAN14S-12828

Issue No: 1

## **Maximum Dry Density Report**

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project: QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

IANZ

Approved Signatory: Max Burford (Supervisor)

(Supervisor)
IANZ Accreditation No:200
Date of Issue: 25/06/14

Sample Details

Sample ID: CAN14S-12828

Material: Pit Run

Site/Sampled From: KB's McLeans Island Quarry
Specification: No Specification (Coarse)

Sampling Method: Stated to be NZS 4407:1991 2.4.6.2.1

Technician: Greg Orr

Client Sample ID: Lab Ref 1381/14

Sample Source: Field Sample [Taken From Site]

Date Sampled: 20/06/2014

Sampled By: Advised - See Comments

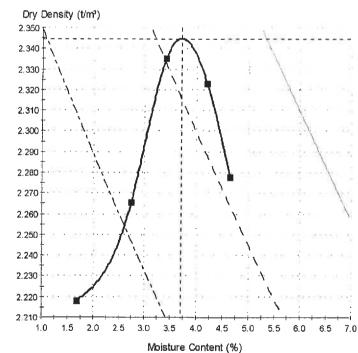
Date Tested: 25/06/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids - - 5% Air Voids





#### Test Results

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 2.34 Optimum Moisture Content (%): 3.8

Solid Density (t/m³): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): 12

Sample History: Natural

Comments

Sampled by C Gould



#### CHRISTCHURCH LABORATORY

397 Moleans Island Road, Harewood P O Box 11-326, Sockburn, Christchurch 8443 Phone: (03) 359-0752, Fax (03) 359-1909

#### **Test Report**

Client:

K.B. Contracting & Quarries Limited

Address:

PO Box 19746, Woolston, Christchurch 8241

Client Ref: Job Location: Not Advised

New Quarry

Material:

Pit run

Material Source:

KB's Quarries McLeans Island

Report No: Report Date:

Sample Date:

Sampled By:

Laboratory No:

11-Oct-2013

11:00

Declan McGowan

C13/2221

158619

18-Oct-2013

Replacement

Page 1 of 1

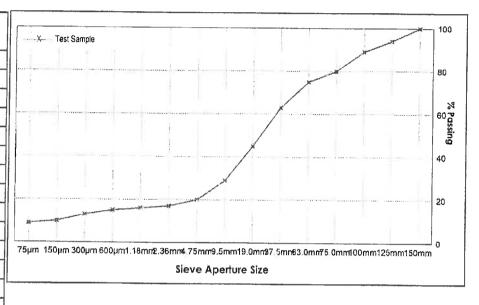
This report supersedes and replaces Report No: 158610

**Test Methods:** 

1 The Particle-Size Distribution - Preferred Method by Wet Sieving

NZS 4407:1991 Test 3.8.1

Sieve Size	Percent	Specification
(BSS)	passing	
125mm	9.4	
100mm	89	
75.0mm	80	
63.0mm	75	
37.5mm	63	
19.0mm	45	
9.5mm	29	
4.75mm	20	
2.36mm	17	
1.18mm	16	
600µm	15	
300µm	13	
1.50µm	10	
75µm	9	



Test Date:

14/10/2013

#### Notes

Test results apply to sample as received.

Percent passing finest sieve obtained by difference.

Sample received in a damp condition.

Date of sample receipt:

11-Oct-13

Craig Kelly **Approved Signatory Laboratory Technician** IANZ Accreditation No. 439 Date of Issue: 10/04/92

C. Kelly



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full.

Doc: WI-LIMS-92

Issue Date: 12/7/13

Issue No: 4



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www.fultonhogan.com 0800 LABORATORY

Report No: MDD:CAN14S-12828

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

ANZ

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 25/06/14

Sample Details

Sample ID:

CAN14S-12828

Material:

Pit Run

Site/Sampled From:

KB's McLeans Island Quarry

Specification: Sampling Method: No Specification (Coarse)

Technician:

Stated to be NZS 4407:1991 2.4.6.2.1

Greg Orr

Client Sample ID:

Sample Source:

Lab Ref 1381/14 Field Sample [Taken From Site]

Date Sampled:

20/06/2014

Sampled By:

Advised - See Comments

Date Tested:

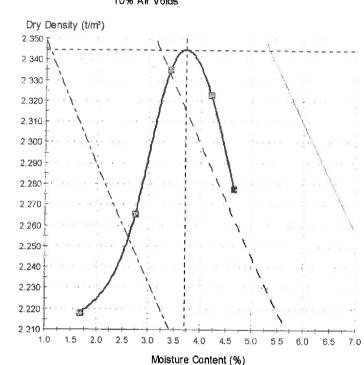
25/06/2014

Sampling Endorsed?: No

#### **Dry Density - Moisture Relationship**

0% Air Voids 10% Air Voids

5% Air Voids



#### **Test Results**

\_NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 2.34

Optimum Moisture Content (%): 3.8

Solid Density (t/m³):

Sample History:

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

37.5 12

Natural

Comments Sampled by C Gould



325 Pound Rd, Yaldhurst, Christchurch PO Box 16-064, Christchurch 8441 Telephone:

+64 3 349 9142 Facsimile: +64 3 349 9143 www.fultonhogan.com

0800 LABORATORY Report No: MDD:CAN14S-11472

Issue No: 1

## **Maximum Dry Density Report**

Toni O'Regan City Care Limited Client:

PO Box 7669 Sydenham

Christchurch 8240

Project: QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 03/06/14

Sample Details

Sample ID: CAN14S-11472

Material: Pit Run

Site/Sampled From: KB Quarry Scalped over 53mm

Specification: No Specification

Sampling Method: Stated to be NZS 4407:1991 2.4.6.2.2

Technician: Greg Orr **Client Sample ID:** 953081

Sample Source:

Miscellaneous Material Source

Date Sampled: 29/05/2014

Sampled By: Advised - See Comments

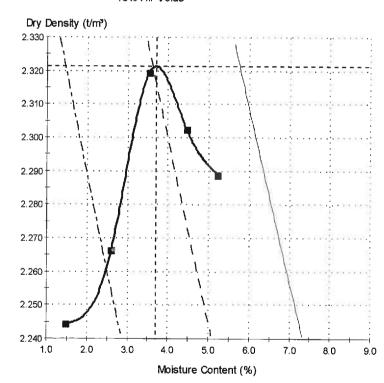
**Date Tested:** 03/06/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids 5% Air Voids

10% Air Voids



#### Test Results

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 2.32 Optimum Moisture Content (%): 3.6

Solid Density (t/m³): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): 14 Sample History:

Natural

Comments

Sampled by Toni O'Regan

DITRIN- MCLEANS ISLAND

#### Canterbury Laboratory

325 Pound Rd, Yaldhurst, Christchurch PO Box 16-064, Christchurch 8441 Telephone: +64 3 349 9142 Facsimile: +64 3 349 9143

www.fultonhogan.com 0800 LABORATORY

Report No: MDD:CAN14S-12828

Issue No: 1

## Maximum Dry Density Report

**Fulton Hogan** 

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

IANZ

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford (Supervisor) IANZ Accreditation No:200 Date of Issue: 25/06/14

Sample Details

Sample ID:

CAN14S-12828

Material:

Pit Run

Site/Sampled From:

KB's McLeans Island Quarry

Specification:

No Specification (Coarse) Stated to be NZS 4407:1991 2.4.6.2.1

Sampling Method: Technician:

Greg Orr

Client Sample ID:

Lab Ref 1381/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

20/06/2014

Sampled By:

Advised - See Comments

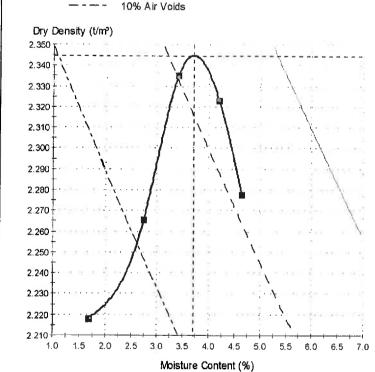
Date Tested:

25/06/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids — — — 5% Air Voids



#### Test Results

\_\_\_\_ NZS 4402:1986 Test 4.1.3 - 1986 \_

Maximum Dry Density (t/m³): 2.34 Optimum Moisture Content (%): 3.8

Solid Density (t/m³):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

37.5 12

Sample History:

Natural

Comments Sampled by C Gould

Form No: 18995, Report No: MDD:CAN14S-12828

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Page 1 of 1

# VITRUM- MCLEANS ISLAND

#### CHRISTCHURCH LABORATORY

397 Mcleans Island Road, Harewood P O Box 11-326, Sockburn, Christchurch 8443 Phone: (03) 359-0752, Fax (03) 359-1909

#### **Test Report**

Client:

K.B. Contracting & Quarries Limited

Address:

PO Box 19746, Woolston, Christchurch 8241

Client Ref:

Not Advised

Job Location: Material

New Quarry

Pit run

Material Source:

KB's Quarries McLeans Island

This report supersedes and replaces Report No: 158610

Report Date:

Sample Date:

Laboratory No:

Sampled By:

Report No:

11-Oct-2013

11:00

Declan McGowan

C13/2221

158619 18-Ocf-2013

Replacement

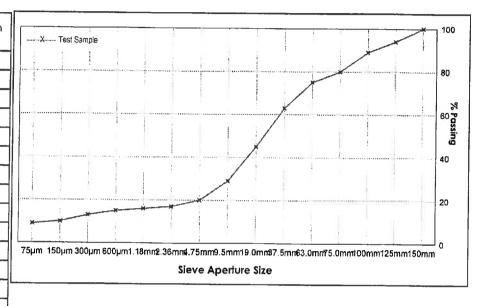
Page 1 of 1

Test Methods:

1 The Particle-Size Distribution - Preferred Method by Wet Sieving

NZS 4407:1991 Test 3.8.1

Sieve Size (BSS)	Percent passing	Specification
125mm	94	
100mm	89	
75.0mm	80	
63.0mm	75	
37.5mm	63	
19.0mm	45	
9.5mm	29	
4.75mm	20	
2.36mm	17	
1.18mm	16	
600µm	15	
300µm	13	
1 <i>5</i> 0µm	10	
75µm	9	



Test Date:

14/10/2013

#### Notes

Test results apply to sample as received. Percent passing finest sieve obtained by difference. Sample received in a damp condition.

Date of sample receipt:

11-Oct-13

Craig Kelly **Approved Signatory** Laboratory Technician IANZ Accreditation No: 439 Date of Issue: 10/04/92

C. Kelly



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full.



325 Pound Rd. Yaldhurst. Christchurch PO Box 16-064, Christchurch 8441 Telephone: +64 3 349 9142 Facsimile:

+64 3 349 9143 www.fultonhogan.com 0800 LABORATORY

**Canterbury Laboratory** 

Report No: MDD:CAN14S-11472

Issue No: 1

## **Maximum Dry Density Report**

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project: QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 03/06/14

Sample Details

Sample ID:

CAN14S-11472

Pit Run

Site/Sampled From:

KB Quarry Scalped over 53mm

Shecification:

No Specification

apling Method:

Stated to be NZS 4407:1991 2.4.6.2.2

Technician:

Material:

Greg Orr

Client Sample ID: 953081

Sample Source:

Miscellaneous Material Source

Date Sampled:

29/05/2014

Sampled By:

Advised - See Comments

**Date Tested:** 

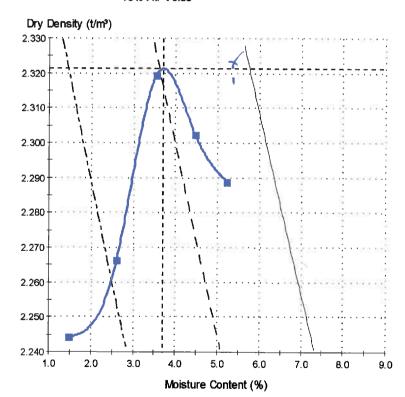
03/06/2014

Sampling Endorsed?: No

#### **Dry Density - Moisture Relationship**

0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

.NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 2.32 Optimum Moisture Content (%): 3.6

Solid Density (t/m3):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%): Sample History:

37.5 14

Natural

Comments

Sampled by Toni O'Regan

Form No: 18995, Report No: MDD:CAN14S-11472

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9 5	13 " 1	1 1	0 1 5		

CITY CARE LABORATORY	The state of the s
Nuclear Density Test - Backscatter Nuclear Density Test (NZS 4407:1991 Test 4.2.2)	Lab Reference: (1601 //4) (Test Number / Year)
Material: PIT RUN MCLEANS ISLAN	<sup>U</sup> Gauge Used: 65636
Location: CDL PRESTONS.	WEST SIDE LIFT # 4
Client: KBS	Contact Name: A HODGSON,
Tested By: <u>L.S</u> Date of Test: <u>II - 7 - 14</u>	
Minimum PPE Required: Hard Hat Safety Glasses	Gloves Carried Hi Vis Sun Protection
Familiar with City Care Health and Safety Plan:  1. All Worksites  7. Laboratory  30. All V	Vehicles and Plant 4. Office Work
(Eliminate / Isolate / Minimise) Any Site Specific Hazards and controls	taken? (Sign into site, working plant, traffic etc.)
_	
PLATEAU TE	ST
Target Density: 2340 Lab Ref:	Date of Issue:

Lab Ref:

			<del></del>			Dute 0	1 10040.	
	Moistur	e Standard:	693		Density Star	ndard: _	2313.	
	Site Number	Dry Density (kg/m³)	Dry Density (corrected)	Wet Density (kg/m³)	Wet Density (corrected)	Moisture Content (%)	Moisture Content (corrected)	Percent Compaction
		KOLL	ER TYPE	Bomas.	WEIGHT	28000	<b>S</b> .	
				5		ATIC		
ť	x.5	2162	2160	2275	22 CD	<i></i>		0.2 4
2	YZ.	2181	2180		2280	5.2	5.0	92.4
3	xC	2186	2190	2287	2290	4.9	5.0	93.2
				2291	2290	4.8	5.0	93.4
4	X8	2754	2250	2360	2360	4.7	4.8 5.0	96.3
5	XIO	2752	2250	7370	2370	5.2		96.2
7	X12	2279	2280	7397	2400	5.0	5.0	97.6
8	714	2267	2270	2381	2380	5.0	5.0	96.9
9	x16	2271	2270	2384	2380	5.0	2.0	97.0
10	XYS	2262	2260	2368	2370	4.7	4.5	96.7
ŧ	Y 20	2308	2310	7431	2420	5.4	5.5	98.6
۷.	122	.2313	23/0	2429	2430	5.0	5.0	98.8
13	× 24	2259	2260	2368	2370	48	5.0	96.6
4	y 26	2224	2220	2346	2350	5.2	5.0	96.6 95.1
		2244	2740	2359	2360	5.1	5.0	95.9
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}								
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- 1		1	1	1				

WS13, Issue Number 6, Issue Date 2 August 2012

Notes:

Checked By: \_

Date of Issue:

#### DRY DENSITY / WATER CONTENT RELATIONSHIP VIBRATING COMPACTION

Project:

**Quality Assurance** 

Location:

**Prestons Road Subdivision** 

Client:

Coffey Geotechnical

Contractor:

Not Advised

Sampled by:

S Gardner

Date sampled:

11 June 2014 Not Advised

Sampling method: Sample description:

Pit Run

Sample condition:

Solid density:

Damp as Received

2.68

Source:

t/m³ (Assumed)

Prestons Road-KB's Quarries

Project No:

6-JCOFF.14/6LC

Lab Ref No:

13379

Client Ref No:

A Wills

		n 1=	<u> </u>				
		1		Test Results			
Maximum dry densi		(2.42)	t/m³		Natural water		- %
Optimum water con	tent	3.2	%		Fraction teste	d Passing	g 37.5mm Test Sieve
Sample ID		1%	2%	3%	4%	5%	
Bulk density	t/m³	2.330	2.385	2.491	2.486	2.470	
Water content	%	1.2	2.1	3.0	3.7	4.3	
Dry density	t/m³	2.302	2.334	2.418	2.397	2.368	
Sample condition		Dry	Moist	Moist	Wet	Saturated	
		Firm	Firm	Hard	Fines Lost	Fines Lost	
2.440				Compactio	n Curve		
2.420 - 2.400 - 2.380 - 2.360 - 2.360							
2.340	·				Andrew Control of the		
2.320						******	
1		2	Water 0	3 Content %		4	5

Test Methods		Notes	
Compaction	NZS 4402 : 1986 : Test 4.1.3		

Date tested: Date reported: 13 June 2014 19 June 2014

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

This report may only be reproduced in full

IANZ Approved Signatory

Designation:

Senior Civil Engineering Technician

Date:

19 June 2014

ACCREDITED LABORATORY

Tests Indicated as not accredited are outside the scope of the laboratory's accreditation

PF-LAB-027 (30/05/2013)

Page 1 of 1

Opus International Consultants Ltd

Christchurch Laboratory

Quality Management Systems Certified to ISO 9001

52C Hayton Rd, Wigram

PO Box 1482, Christchurch Mail Centre,

Christchurch 8140, New Zealand

Telephone +64 3 343 0739 Facsimile

Website www.opus.co.nz



325 Pound Rd, Yaldhurst, Christchurch PO Box 16-064, Christchurch 8441 **Telephone:** +64 3 349 9142

Facsimile: +64 3 349 9143 www.fultonhogan.com 0800 LABORATORY

Report No: MDD:CAN14S-22802

Issue No: 1

## **Maximum Dry Density Report**

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project: QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

IANZ

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 07/11/14

Sample Details

Sample ID: CAN14S-22802

Material: BEACH SAND

Site/Sampled From: Ex CDL Prestons Road Lot 3096

\*pecification: No Specification

Sampling Method: As Received - Not Accredited

Technician:

Max Burford

Client Sample ID:

le ID: Lab Ref 2685/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

30/10/2014

Sampled By:

Advised - See Comments

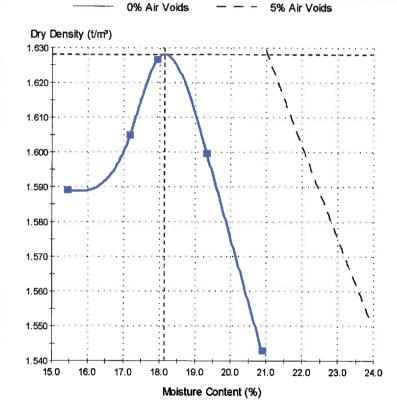
Date Tested:

07/11/2014

Sampling Endorsed?: No

#### **Dry Density - Moisture Relationship**

or at a transfer of the second



#### **Test Results**

\_\_\_NZS 4402:1986 Test 4.1.3 - 1986 \_\_\_

Maximum Dry Density (t/m³): 1.62

Optimum Moisture Content (%): 18 Solid Density (t/m³): 2.6

folid Density (t/m³): 2.68 assumed fraction Tested Passes (mm): 37.5

Fraction Tested Passes (mm): 37.5

Material Removed (%): 0

Sample History: Natural

#### Comments

Sampled by Toni O'Regan



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## **Maximum Dry Density Report**

**F** Fulton Hogan

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

Report No: MDD:CAN14S-12043 issue No: 1

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No 200 Date of Issue: 11/06/14

Sample Details

Sample ID:

CAN14S-12043

Material:

**BEACH SAND** 

Site/Sampled From:

CDL Prestons Rd Peat Area C

່າecification:

No Specification

ampling Method:

As Received - Not Accredited

Technician:

Daniel Daly

Client Sample ID:

Lab Ref 1322/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled: Sampled By:

06/06/2014 Not Advised

Date Tested:

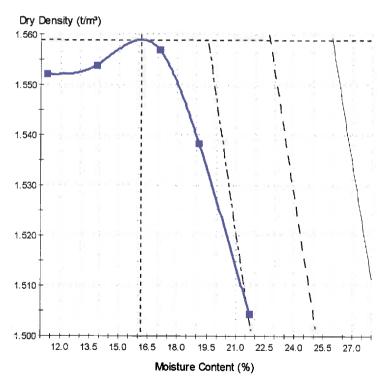
11/06/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.56 Optimum Moisture Content (%): 16

Solid Density (t/m3): 2.62 assumed

Fraction Tested Passes (mm): Material Removed (%):

0

Sample History:

Natural

37.5

#### Comments

Material is beach sand with a trace of organic

Form No: 18995, Report No: MDO:CAN145-12043

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Page 1 of 1

Fulton Hogan

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www.fultonhogan.com 0800 LABORATORY

Report No: MDD:CAN14S-08017

Issue No: 1

## Maximum Dry Density Report

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 11/04/14

Sample Details

Sample ID:

CAN14S-08017

Material:

**BEACH SAND** 

Site/Sampled From:

CDL Prestons Road, Peat Area E

Specification:

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Greg Orr

Client Sample ID:

0830/14 - MF, LS

Sample Source: Date Sampled:

Field Sample [Taken From Site] 02/04/2014

Sampled By:

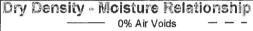
Mark Foster

Date Tested:

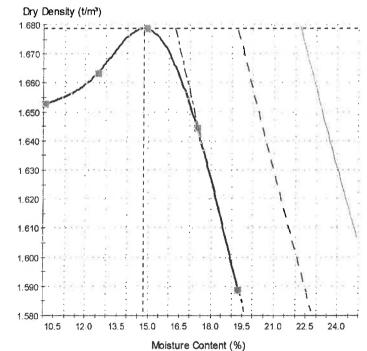
5% Air Voids

11/04/2014

Sampling Endorsed?: No



10% Air Voids



#### **Test Results**

\_NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³):

1.68

37.5

Optimum Moisture Content (%): 15 Solid Density (t/m³):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

Sample History:

Natural

#### Comments

Material is best described as FINE SAND with some medium sand and rare silt 23% medium sand with 72% FINE SAND and 5% silt



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Report No: MDD:CAN14S-05060

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the seboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 06/03/14

Sample Details

Sample ID:

CAN14S-05060

Material:

**BEACH SAND** 

Site/Sampled From:

Prestons Road Alpine V Site A

Specification: Sampling Method: No Specification

As Received - Not Accredited

Technician:

Daniel Daly

Client Sample ID:

0428/14 Site A

Sample Source:

Field Sample [Taken From Site]

Date Sampled: Sampled By:

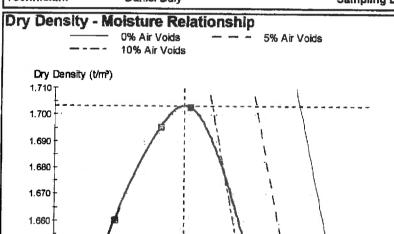
25/02/2014

Advised - See Comments

Date Tested:

06/03/2014

Sampling Endorsed?: No



#### Test Results

\_ NZS 4402:1986 Test 4.1.3 - 1986 Maximum Dry Density (t/m²):

Optimum Moisture Content (%): 14

Solid Density (t/m²): Fraction Tested Passes (mm):

2.68 assumed 37.5

Material Removed (%):

Sample History:

Natural

1.650 1.640 1.630 1.620 1.610 1 600 6.0 7.5 9.0 10.5 12.0 13.5 15.0 16.5 18.0 19.5 21.0 22.5 24.0 25.5 Moisture Content (%)

#### Comments

80% MEDIUM SAND 18% fine sand & 2% silt

Form No: 18995. Report No: MDD:CAN14S-05030

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## **Maximum Dry Density Report**

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

**Project:** 

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to sample as received. This report must be reproduced in fulf.

Report No: MDD:CAN14S-05051

IANZ

Approved Signatory: Max Burford (Supervisor) IANZ Accreditation No:200 Date of Issue: 06/03/14

Sample Details

Sample ID:

CAN14S-05061

Material: Site/Sampled From:

**BEACH SAND** 

Specification:

Prestons Road Alpine V Site B

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Daniel Daly

**Client Sample ID:** 

0429/14 Site B

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

25/02/2014

Sampled By:

Advised - See Comments

Date Tested:

5% Air Voids

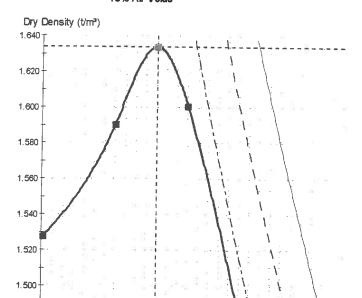
06/03/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids

10% Air Voids



4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 Moisture Content (%)

#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m²): 1.64:-

Optimum Moisture Content (%): 14 Solid Density (t/m³):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

37.5

Sample History:

Natural

Comments

1.480

50% MEDIUM SAND 46% fine sand & 4% silt

Farm No. 18995, Report No: MDD:CAN14S-05061

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Report No: MDD:CAN14S-05062

legue Mo: 1

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

ANZ

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to sample as received. This report must be reproduced in full.

Approved Signatory: Max Burford (Supervisor) IANZ Accreditation No:200

Date of Issue: 06/03/14

Sample Details

Sample ID:

CAN14S-05062

Material:

**BEACH SAND** 

Site/Sampled From:

Prestons Road Alpine V Site C

Specification:

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Daniel Daiv

Client Sample ID:

Sample Source:

0430/14 Site C Field Sample [Taken From Site]

Date Sampled:

25/02/2014

Sampled By:

Advised - See Comments

**Date Tested:** 

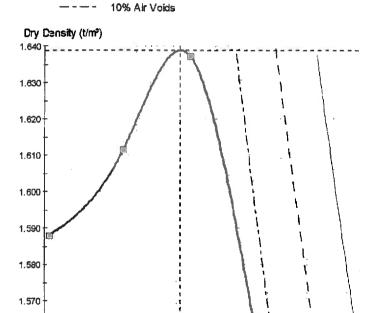
06/03/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids

5% Air Voids



6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 Moisture Content (%)

#### Test Results

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.64 Optimum Moisture Content (%): 13

Solid Density (t/m²):

Sample History:

2.68 assumed 37.5

Fraction Tested Passes (mm): Material Removed (%):

'n

Natural

Comments

1.560

35% MEDIUM SAND 50% fine sand & 15% silt

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Report No: MDD:CAN14S-08055

### **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The lest (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

Approved Signatory: Max Burford (Supervisor) IANZ Accreditation No.200

Date of Issue: 11/04/14

Sample Details

Sample ID:

CAN14S-08055

Material:

Silty Sand

Site/Sampled From:

CDL Prestons Road Site D

Specification:

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Greg Orr

Client Sample ID:

0826/14 - MF, LS

Sample Source:

Miscellaneous Material Source

Date Sampled:

02/04/2014

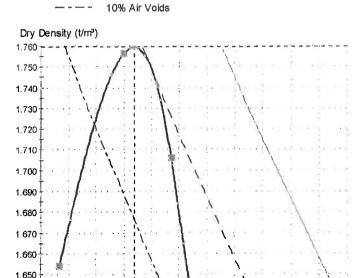
Sampled By: Date Tested: Mark Foster 11/04/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids

5% Air Voids



#### Test Results

NZS 4402:1986 Test 4.1 3 - 1986

Maximum Dry Density (t/m³): 1.76 Optimum Moisture Content (%): 16

Solid Density (t/m3):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

37.5

Sample History:

Natural

#### Comments

1.640 1 630

> 13.0 14.0

15.0

16.0

17.0

18.0

Moisture Content (%)

19.0 20.0

Matreial is best described as mediun FINE SAND with some silt 1% coarse sand 29% medium sand with 50% FINE SAND and 20% silt

21.0

22.0

23.0

**-** Fulton Hogan

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0800 LABORATORY Report No: MDD: CAN14S-07948

## Maximum Dry Density Report

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No.200 Date of Issue: 11/04/14

Sample Details

Sample ID:

CAN14S-07948

Material:

Silty Sand

Site/Sampled From:

CDL Prestons Road, Site E

Specification:

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Greg Orr

Client Sample ID:

0827/14 - MF, LS

Sample Source:

Miscellaneous Material Source

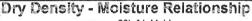
Date Sampled: Sampled By:

02/04/2014 Mark Foster

Date Tested:

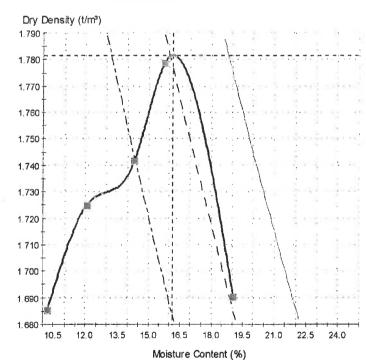
09/04/2014

Sampling Endorsed?: No



0% Air Voids 5% Air Voids

10% Air Voids



#### Test Results

Sample History:

\_ NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.78 Optimum Moisture Content (%): 16

Solid Density (t/m³): 2.68

Fraction Tested Passes (mm): Material Removed (%):

Natural

37.5

#### Comments

Material is best described as silty FINE SAND 30% silt and 70% fine sand



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Report No: MDD:CAN14S-08057

Issue No: 1

## Maximum Dry Density Report

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

was a

Approved Signatory: Max Burford (Supervisor) IANZ Accreditation No:200

Date of Issue: 11/04/14

Field Sample [Taken From Site]

Sample Details

Sample ID:

CAN14S-08057

Material: Site/Sampled From: Silty SAND

Specification:

CDL Prestons Road Site F

Sampling Method:

No Specification (Fine) As Received - Not Accredited

Technician:

Greg Orr

Client Sample ID:

0828/14 - MF, LS

Sample Source: Date Sampled:

02/04/2014

Sampled By:

Mark Foster

**Date Tested:** 

11/04/2014

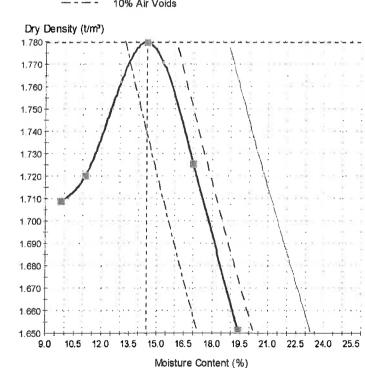
Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids

10% Air Voids

5% Air Voids



#### Test Results

Sample History:

\_NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.78 Optimum Moisture Content (%): 14

Solid Density (t/m³):

2.68 assumed 37.5

Fraction Tested Passes (mm): Material Removed (%):

Natural

Comments

Material is best described as silty FINE SAND 28% silt 70% fine sand and 2% medium sand



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Report No: MDD:CAN14S-08006

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless indicated) have been performed in accordance with the laboratory's scope of accreditation. Results only apply to samples as received. This report must be reproduced in full.

Approved Signatory: Max Burford (Supervisor)
IANZ Accreditation No:200

Date of Issue: 11/04/14

Sample Details

Sample ID:

CAN14S-08006 BEACH SAND

Material: Site/Sampled From:

CDL Prestons Road, Site G

Specification:

No Specification

Sampling Method:

As Received - Not Accredited

Technician:

Greg Orr

Client Sample ID:

Sample Source:

0829/14 - MF, LS Field Sample [Taken From Site]

Date Sampled:

02/04/2014 Mark Foster

Sampled By: Date Tested:

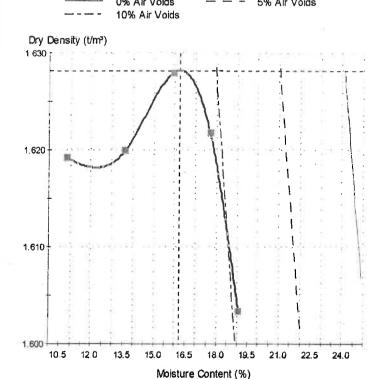
11/04/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids

5% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.62 Optimum Moisture Content (%): 16

Solid Density (t/m³):

2.68 assumed

Fraction Tested Passes (mm): Material Removed (%):

37.5

Sample History:

Natural

#### Comments

Material is best described as BEACH SAND 55% medium sand with 43% fine sand with 2%silt



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0800 LABORATORY Report No: MDD:CAN14S-25525

Issue No: 1

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with may only be reproduced in full.



Approved Signatory: Max Burford

(Supervisor)
IANZ Accreditation No:200 Date of Issue: 15/12/14

Sample Details

Sample ID:

CAN14S-25525

Material:

Sand

Site/Sampled From: Specification:

Test Site # I

No Specification (Fine) Not Advised - Not Accredited

Sampling Method: Technician:

Marc Bos

Client Sample ID: 3092/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

08/12/2014

Sampled By:

Advised - See Comments

**Date Tested:** 

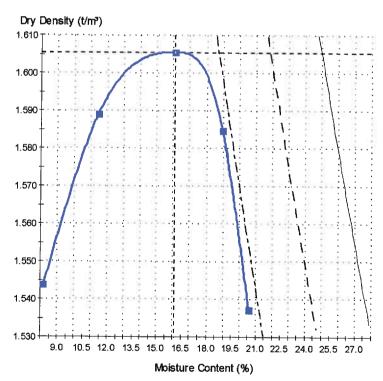
15/12/2014

Sampling Endorsed?: No

#### **Dry Density - Moisture Relationship**

0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.60 Optimum Moisture Content (%): 16

Solid Density (t/m3): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): 0 Sample History: Natural

Comments

Sampled by LS



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Report No: MDD:CAN14S-25526

Issue No: 1

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.



Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 15/12/14

Sample Details

Sample ID:

CAN14S-25526

Material:

Sand

Site/Sampled From: Specification:

Site # J No Specification (Fine)

Sampling Method:

As Received - Not Accredited

Technician:

Marc Bos

Client Sample ID: 3093/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

08/12/2014

Sampled By:

Advised - See Comments

**Date Tested:** 

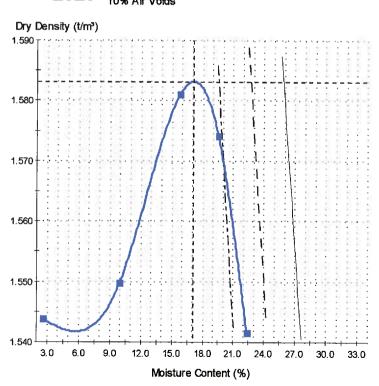
15/12/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.58 Optimum Moisture Content (%): 17

Solid Density (t/m³): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): 0 Sample History:

Natural

Comments Sampled by LS



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Report No: MDD:CAN14S-25527

Issue No: 1

0800 LABORATORY

## **Maximum Dry Density Report**

Client:

Toni O'Regan City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.



Approved Signatory: Max Burford

(Supervisor)
IANZ Accreditation No:200 Date of Issue: 15/12/14

Sample Details

Sample ID:

CAN14S-25527

Material:

Sand

Site/Sampled From:

CDC Prestons Sample K No Specification (Fine)

Sampling Method:

Specification:

As Received - Not Accredited

fechnician:

Marc Bos

Client Sample ID: 3094/14

Sample Source:

Field Sample [Taken From Site]

Date Sampled:

08/12/2014

Sampled By:

Advised - See Comments

**Date Tested:** 

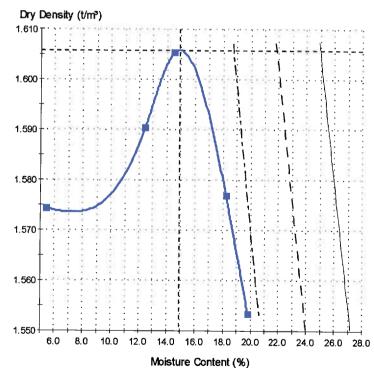
15/12/2014

Sampling Endorsed?: No



0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.60 Optimum Moisture Content (%): 15

Solid Density (t/m³): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): Sample History:

Natural

Comments

Sampled by LS



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## **Maximum Dry Density Report**

Fulton Hogan

Client: Toni O'Regan

City Care Limited PO Box 7669 Svdenham

Christchurch 8240

Project: QA Testing - City Care Ltd Report No: MDD:CAN14S-11317 Issue No: 1

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford

(Supervisor) IANZ Accreditation No:200 Date of Issue: 30/05/14

Sample Details

Sample ID: CAN14S-11317

Material: **BEACH SAND** 

Site/Sampled From: CDL Prestons Rd, Swale Area A

pecification: No Specification

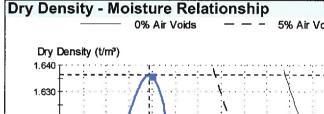
Sampling Method: As Received - Not Accredited

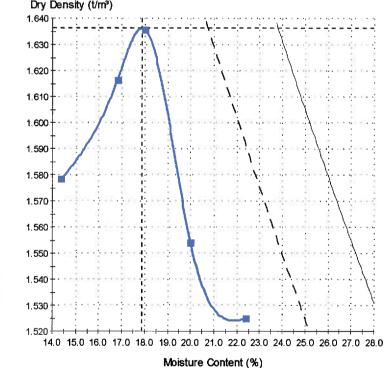
Technician: Atu Rova Client Sample ID: Lab Ref 1181/14

Sample Source: Field Sample [Taken From Site]

Date Sampled: 27/05/2014 Sampled By: Mark Foster **Date Tested:** 30/05/2014

Sampling Endorsed?: No





#### Test Results

.NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): 1.64 Optimum Moisture Content (%): 18

Solid Density (t/m3): 2.68 assumed

Fraction Tested Passes (mm): 37.5 Material Removed (%): Sample History: Natural

#### Comments

The material is best described as FINE SAND with less 5% of medium sand and silt



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Report No: MDD:CAN14S-15900

Issue No: 1

## **Maximum Dry Density Report**

Client: Toni O'Regan

City Care Limited PO Box 7669 Sydenham

Christchurch 8240

Project:

QA Testing - City Care Ltd

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Max Burford

(Supervisor)
IANZ Accreditation No:200 Date of Issue: 13/08/14

Sample Details

Sample ID:

CAN14S-15900

Material:

**BEACH SAND** 

Site/Sampled From:

CDL Prestons Road Swale Area B

Specification:

No Specification

Jampling Method:

Stated to be NZS 4407:1991 2.4.6.2.2

Technician:

Max Burford

Client Sample ID:

Lab ref:1833/14

Sample Source: Field Sample [Taken From Site]

Date Sampled:

07/08/2014

Sampled By:

Advised - See Comments

Date Tested:

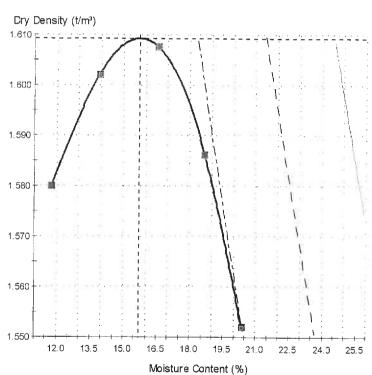
13/08/2014

Sampling Endorsed?: No

#### Dry Density - Moisture Relationship

0% Air Voids 5% Air Voids

10% Air Voids



#### **Test Results**

NZS 4402:1986 Test 4.1.3 - 1986

Maximum Dry Density (t/m³): Optimum Moisture Content (%): 16

Solid Density (t/m3):

2.66 assumed

Fraction Tested Passes (mm): Material Removed (%): Sample History:

37.5

Natural

#### Comments

Sampled by RR

Material is best described as FINE SAND with minor medium sand