

LINEAR SHRINKAGE TEST REPORT



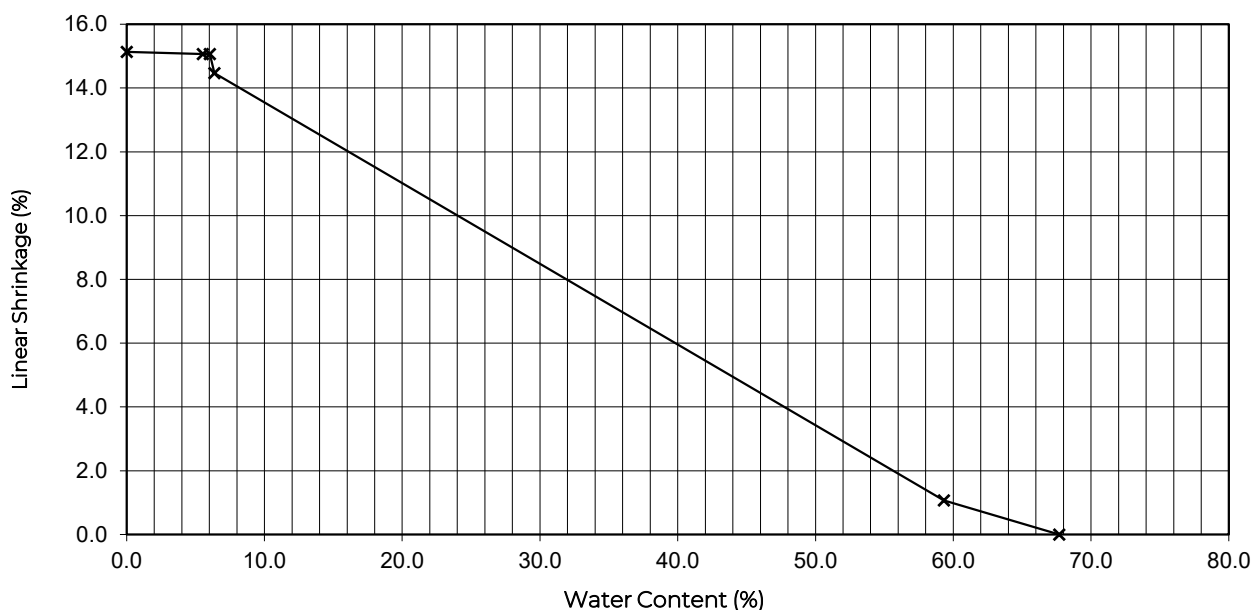
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand
 Sample condition: As Received
 Sample reference: BH2B_1101
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 06/11/25

Date sampled: 14/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/150_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 15
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 17 Blows in liquid limit bowl

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

Date tested: 06-13/11/25

This report may only be reproduced in full

Approved Signatory

Date : 21/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE TEST REPORT

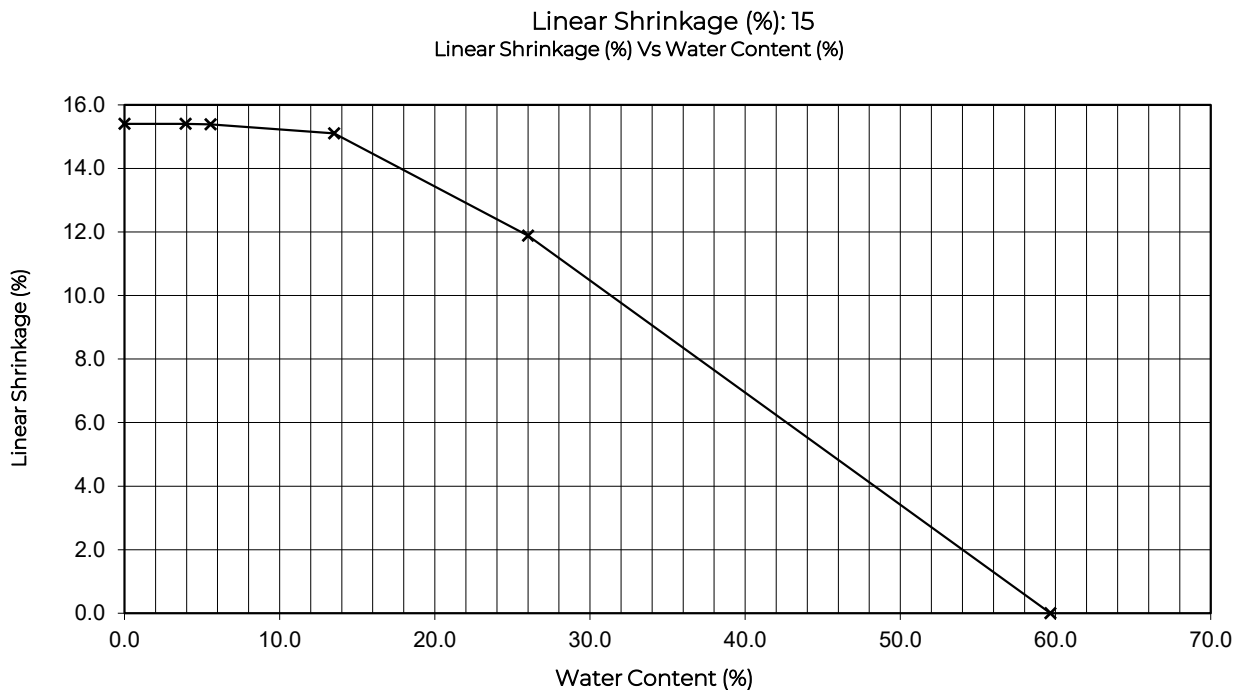


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand
 Sample condition: As Received
 Sample reference: BH2B_1104
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 12/9/25

Date sampled: 20/08/25

Project number: 1-C2466.16
 Lab ref number: WL4708/1_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 12-19/09/2025

This report may only be reproduced in full

Approved Signatory

Date : 03/10/25

Thrushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE
TEST REPORT



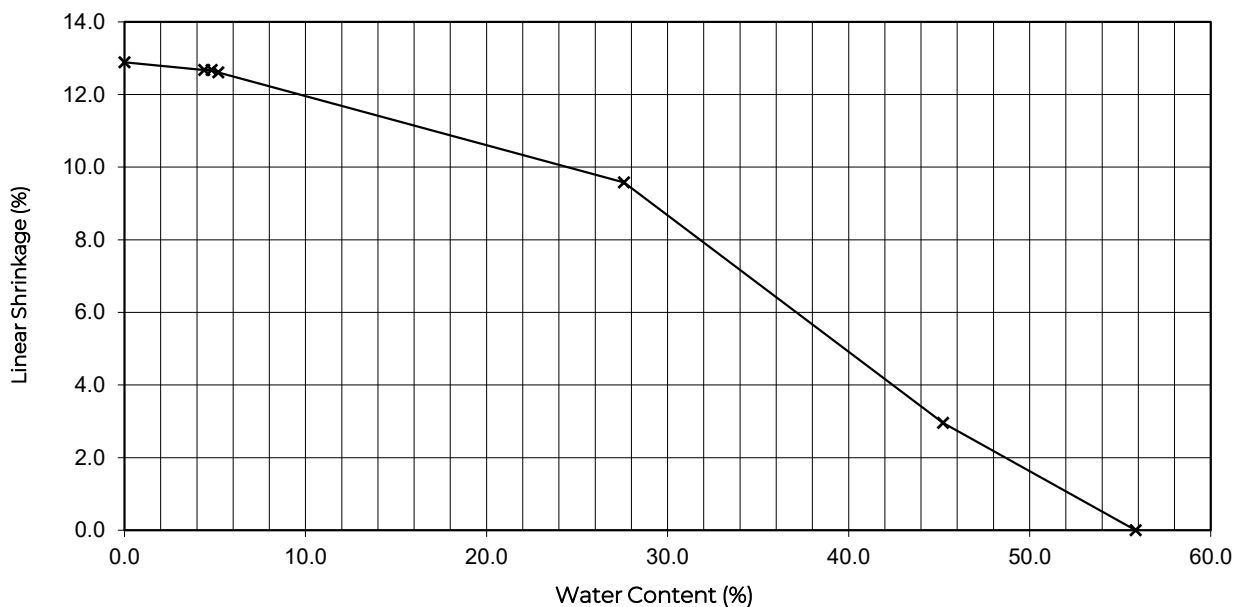
Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Clayey SILT with traces of sand
Sample condition: As Received
Sample reference: BH2B_1105
Sample depth (m): 4.50-4.95
Test specimen depth (m): 4.50-4.95
Date placed in mould: 24/09/2025

Date sampled: 3/09/25

Project number: 1-C2466.16
Lab ref number: WL4708/27_LS
Client ref number: 1-C2466.16
Order number: -

Test results

Linear Shrinkage (%): 13
Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 29/09/2025-02/10/25

This report may only be reproduced in full

Approved Signatory

Date: 22/10/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE TEST REPORT

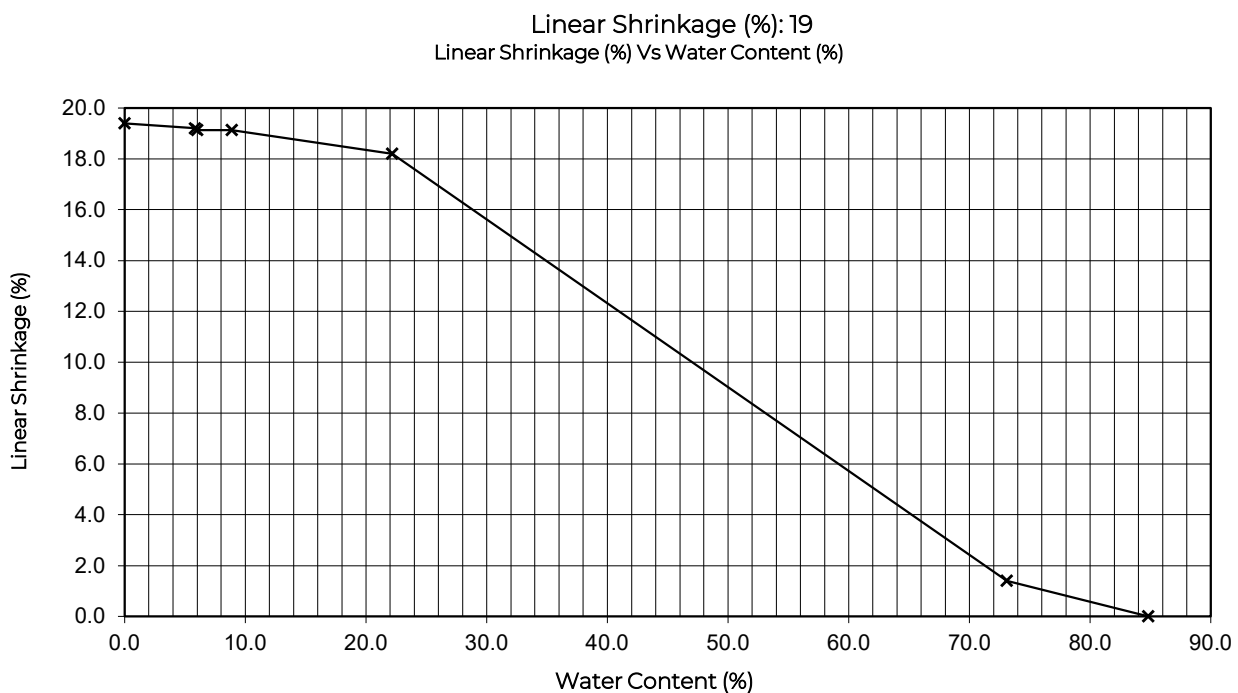


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Silty CLAY with traces of sand
 Sample condition: As Received
 Sample reference: BH2B_1106
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 18/09/25

Date sampled: 19/08/25

Project number: 1-C2466.16
 Lab ref number: WL4708/5_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 23 Blows in liquid limit bowl

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

Date tested: 18-25/09/2025

This report may only be reproduced in full

Approved Signatory

Date: 03/10/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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WSP
 Auckland Laboratory
 Quality Management Systems Certified to ISO 9001

7a Ride Way, Albany
 Private Bag 101982, NS Mail Centre, North
 Shore City 0745, New Zealand

Telephone +64 9 415 4660
 Website www.wsp.com/nz

LINEAR SHRINKAGE TEST REPORT



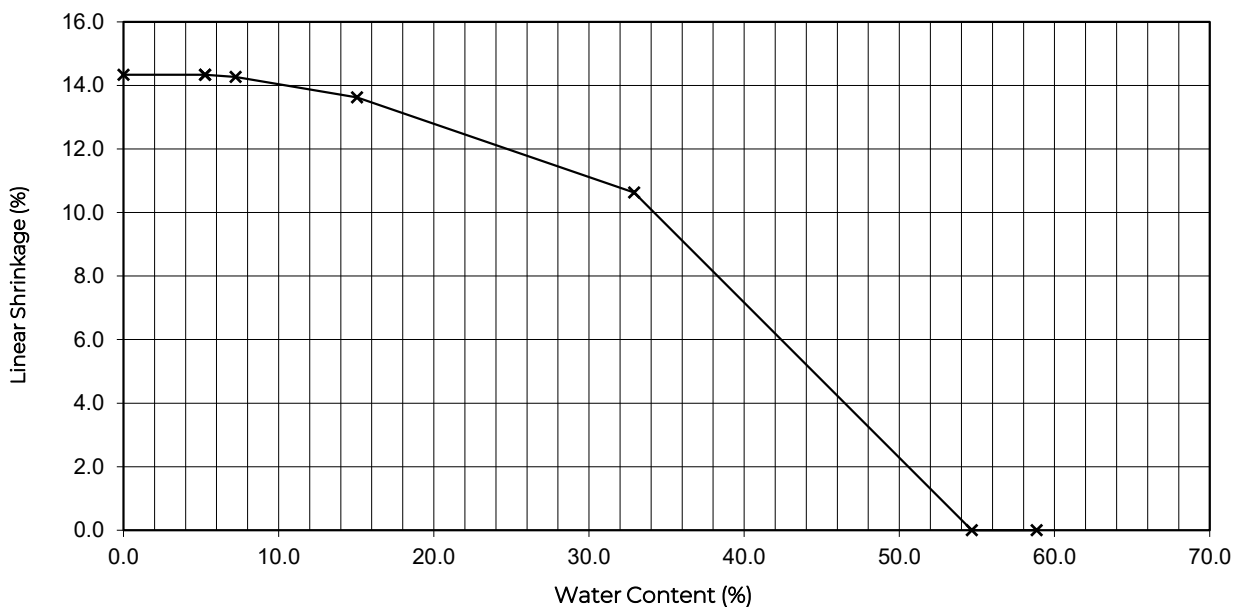
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Sandy clayey SILT
 Sample condition: As Received
 Sample reference: BH2B_1107
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 10/11/25

Date sampled: 8/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/154_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 14
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 06-13/11/25

This report may only be reproduced in full

Approved Signatory

Date : 23/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 17/10/25
Date received : 31/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/161-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/161-LS
Location ID :	BH2B_1108
Sample Depth (m) :	3.50-3.95
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	46.6
Water Content at LS test (%) :	87.0
Linear Shrinkage (%) :	13
Sample Description : WL4708/161-LS Refer to BH2B_1108 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 17/11/25
Date reported : 21/11/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 21/11/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 15/09/25
Date received : 07/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/103_LS
Client Ref No :

Test Results

Sample Lab Ref No : WL4708/103_LS
Location ID : BH2B_1109
Sample Depth (m) : 9.00-9.45
Soil Fraction Tested : -425µm
Sample History : Unknown
Water Content as Rec'd (%) :
Water Content at LS test (%) : 36.3
Linear Shrinkage (%) : 6
Sample Description : Refer to borehole log

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 08/10/25

Date reported : 13/10/25

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

This report may only be reproduced in full

All information supplied by Client

Approved Signatory

Rowan Carlyle

Designation : Laboratory Manager

Date : 09/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Alternative to Brynderwyn Hills Section
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 29/10/25
Date received : 25/11/25
Sampling method : SPT
Sample condition : Natural; as excavated

Project No : 1-C21466.16
Lab Ref No : WL4708/112_LS
Client Ref No :

Test Results	
Sample Lab Ref No :	WL4708/112_LS
Location ID :	BH2B_1110
Sample Depth (m) :	4.50-4.95
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	46.7
Water Content at LS test (%) :	48.4
Linear Shrinkage (%) :	6
Sample Description :	Clayey SILT with some sand

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 26/11/25
Date reported : 02/12/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory
Rowan Carlyle
Designation : Laboratory Manager
Date : 27/11/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE TEST REPORT

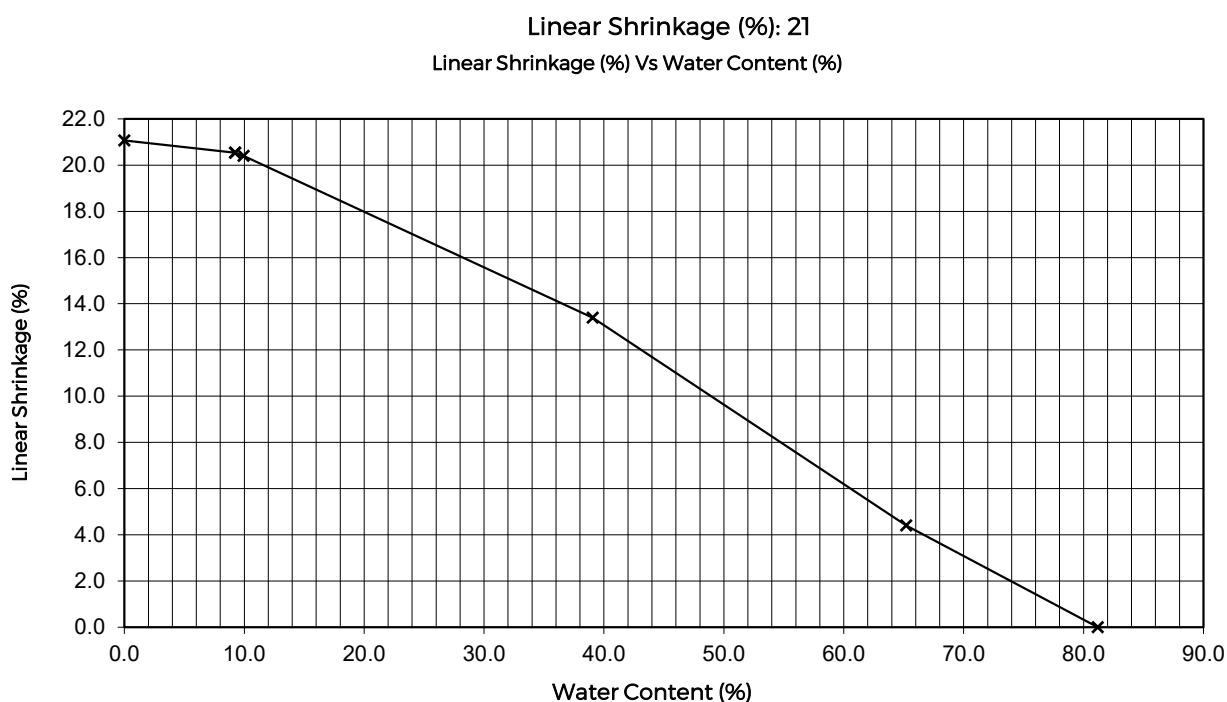


Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Silty CLAY with traces of sand
Sample condition: As Received
Sample reference: BH2B_1113
Sample depth (m): 3.50-3.95
Test specimen depth (m): 3.50-3.95
Date placed in mould: 19/11/25

Date sampled: 30/10/2025

Project number:	1-C2466.16
Lab ref number:	WL4708/168_LS
Client ref number:	1-C2466.16
Order number:	-

Test results



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 19-27/11/25

This report may only be reproduced in full

Approved Signatory

Date : 18/12/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : WSP
Date sampled : 29/09/25
Date received : 10/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/128-LS
Client Ref No : -

Test Results

Sample Lab Ref No : WL4708/128-LS
Location ID : BH2B_1114
Sample Depth (m) : 3.00-3.20
Soil Fraction Tested : -425µm
Sample History : Natural
Water Content as Rec'd (%) : 26.7
Water Content at LS test (%) : 51.7
Linear Shrinkage (%) : 8

Sample Description : WL4708/128-LS Refer to BH2B_1114 log report

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 20/10/25
Date reported : 22/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 22/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE TEST REPORT

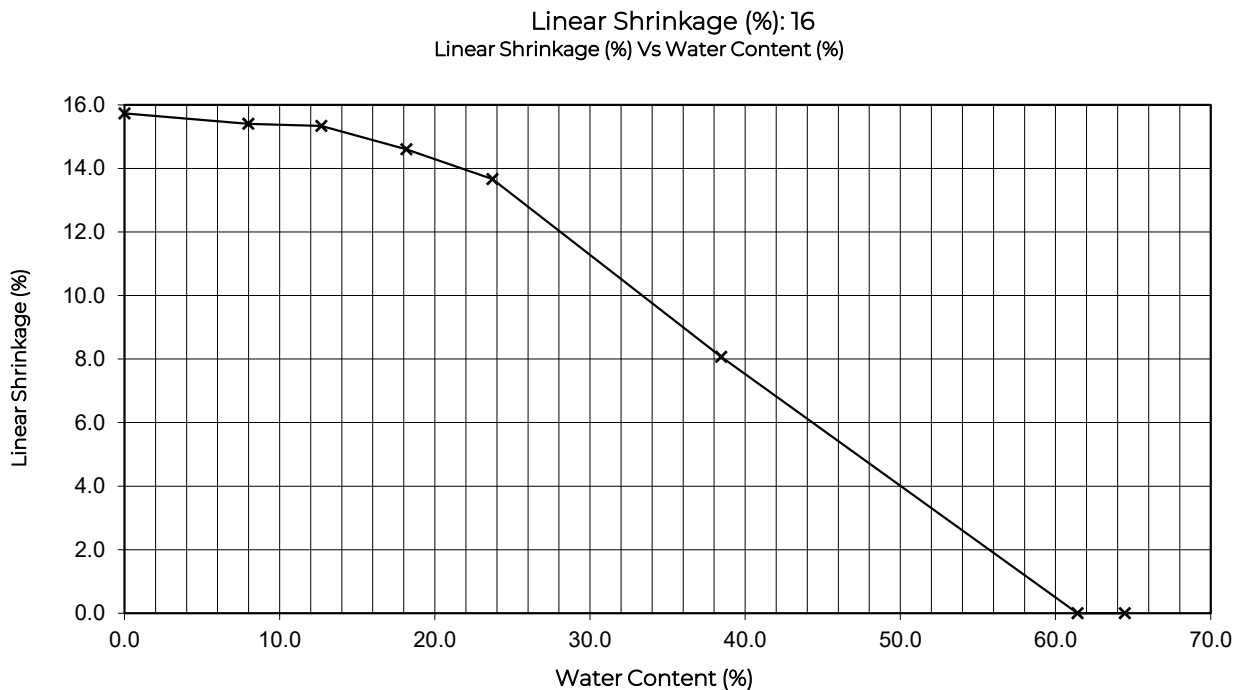


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with minor sand
 Sample condition: As Received
 Sample reference: BH2B_1115
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 29/09/25

Date sampled: 19/08/25

Project number: 1-C2466.16
 Lab ref number: WL4708/12_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 17 Blows in liquid limit bowl

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

Date tested: 29/09/2025-07/10/25

This report may only be reproduced in full

Approved Signatory

Thirushen Pillay
 Senior Civil Engineering Technician

Date : 10/10/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 21 August 2025
Sampling method : SPT
Sample description : Clayey, sandy SILT
Sample condition : As received
Date received : 23 September 2025

Project No : 1-C2466.16
Lab Ref No : WL4708/43-LS
Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/43
Test pit no :	BH2B_1116
Depth :	12.00 - 12.45m
Linear shrinkage :	10%
Sample fraction :	<0.425mm
Date tested :	13/10/2025
Natural water content :	48.1%
Sample fraction :	Whole Soil
Date tested :	25/09/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description in accordance with NZ Geotechnical Society Inc, notes. All information supplied by client. This report may only be reproduced in full.

Date tested : 13 October 2025
Date reported : 30 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician
Date : 30 October 2025



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

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : WSP
Date sampled : 22/09/25
Date received : 03/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/120-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/120-LS
Location ID :	BH2B_1122
Sample Depth (m) :	3.50-3.95
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	30.6
Water Content at LS test (%) :	34.1
Linear Shrinkage (%) :	5
Sample Description : WL4708/120-LS Refer to BH2B_1122 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 17/10/25
Date reported : 10/12/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 10/12/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 26/09/25
Date received : 10/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/125-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/125-LS
Location ID :	BH2B_1124
Sample Depth (m) :	3.00-3.45
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	36.4
Water Content at LS test (%) :	44.8
Linear Shrinkage (%) :	5
Sample Description : WL4708/125-LS Refer to BH2B_1124 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 20/10/25
Date reported : 23/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 23/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : WSP
Date sampled : 18/09/25
Date received : 03/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/123-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/123-LS
Location ID :	BH2B_1125
Sample Depth (m) :	3.00-3.20
Soil Fraction Tested :	-425µm
Sample History :	Natural
Water Content as Rec'd (%) :	40.0
Water Content at LS test (%) :	45.4
Linear Shrinkage (%) :	5
Sample Description : WL4708/123-LS Refer to BH2B_1125 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 17/10/25
Date reported : 21/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 21/10/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 02/10/25
Date received : 14/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/131_LS
Client Ref No :

Test Results

Sample Lab Ref No : WL4708/131_LS
Location ID : BH2B_1126
Sample Depth (m) : 9.00-9.45
Soil Fraction Tested : -425µm
Sample History : Unknown
Water Content as Rec'd (%) :
Water Content at LS test (%) : 49.7
Linear Shrinkage (%) : 9
Sample Description : Refer to borehole log

Test Methods

Water Content NZS 4402 : 1986, Test 2.1
Linear Shrinkage NZS 4402 : 1986, Test 2.6

Notes

Sample description is not IANZ endorsed.

Date tested : 16/10/25
Date reported : 17/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Rowan Carlyle

Designation : Laboratory Manager
Date : 17/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE
TEST REPORT



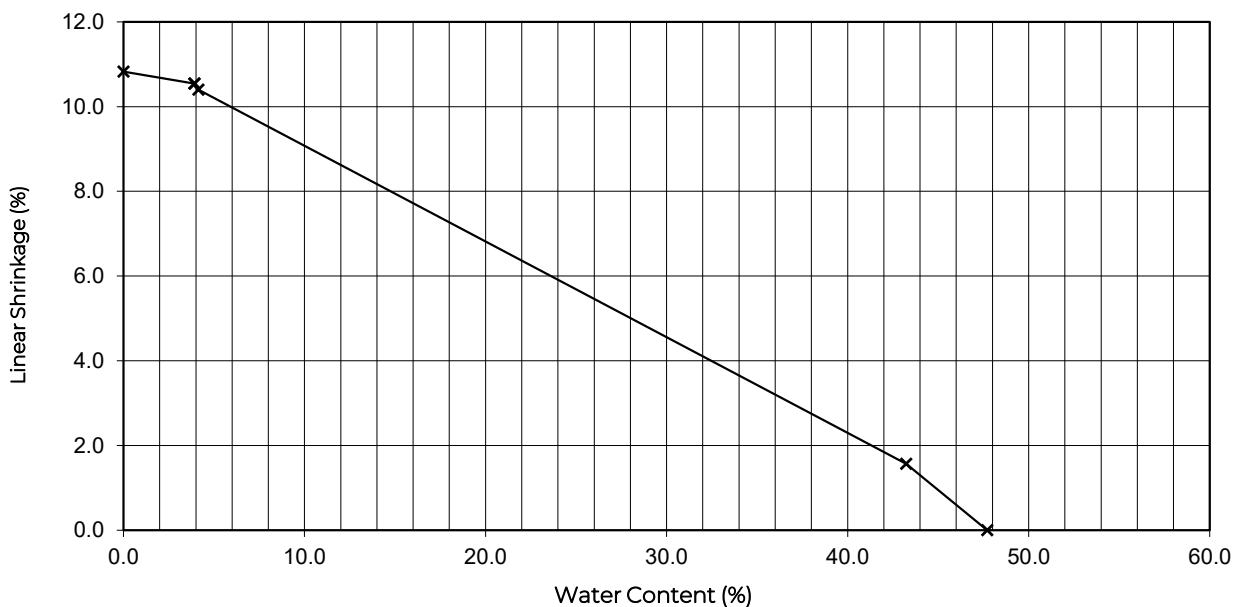
Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Claye SILT with some sand and traces of gravel
Sample condition: As Received
Sample reference: BH2B_1127
Sample depth (m): 3.00-3.45
Test specimen depth (m): 3.00-3.45
Date placed in mould: 24/10/2025

Date sampled: 6/10/25

Project number: 1-C2466.16
Lab ref number: WL4708/138_LS
Client ref number: 1-C2466.16
Order number: -

Test results

Linear Shrinkage (%): 11
Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 24-31/10/25

This report may only be reproduced in full

Approved Signatory

Date: 05/11/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

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LINEAR SHRINKAGE TEST REPORT

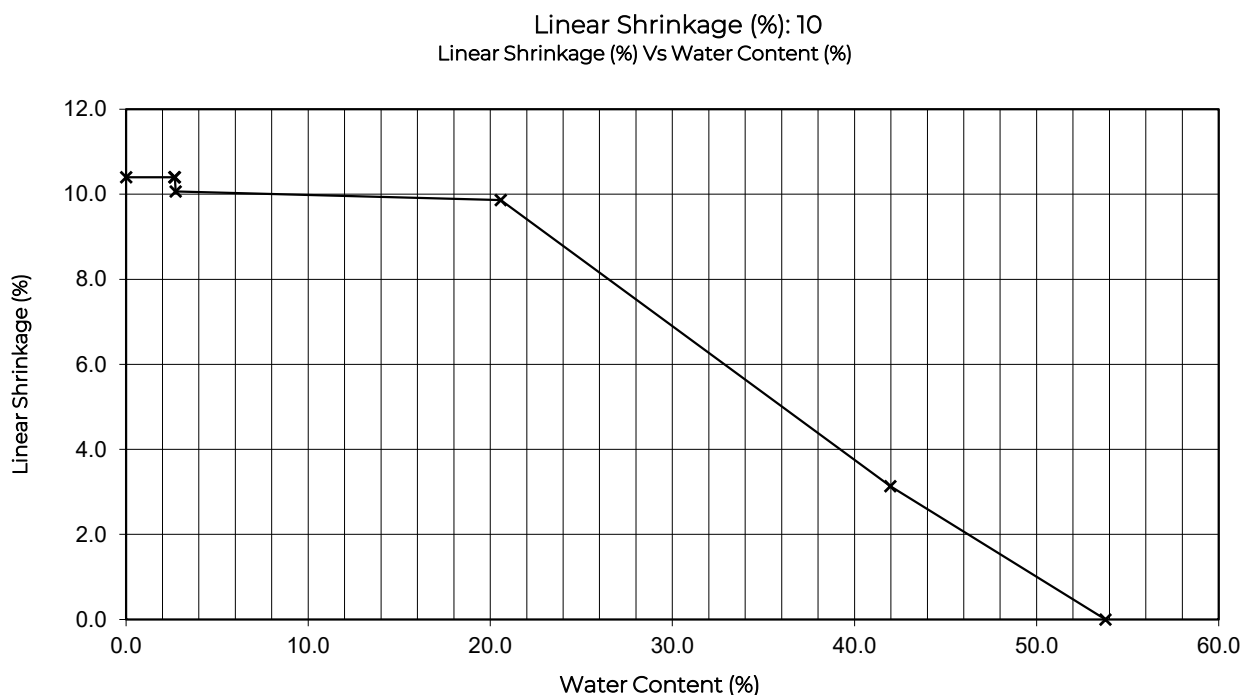


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand and traces of gravel
 Sample condition: As Received
 Sample reference: BH2B_1128
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 03/12/25

Date sampled: 30/10/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/192_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 17 Blows in liquid limit bowl

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

Date tested: 03-11/12/25

Approved Signatory

Date : 23/12/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT

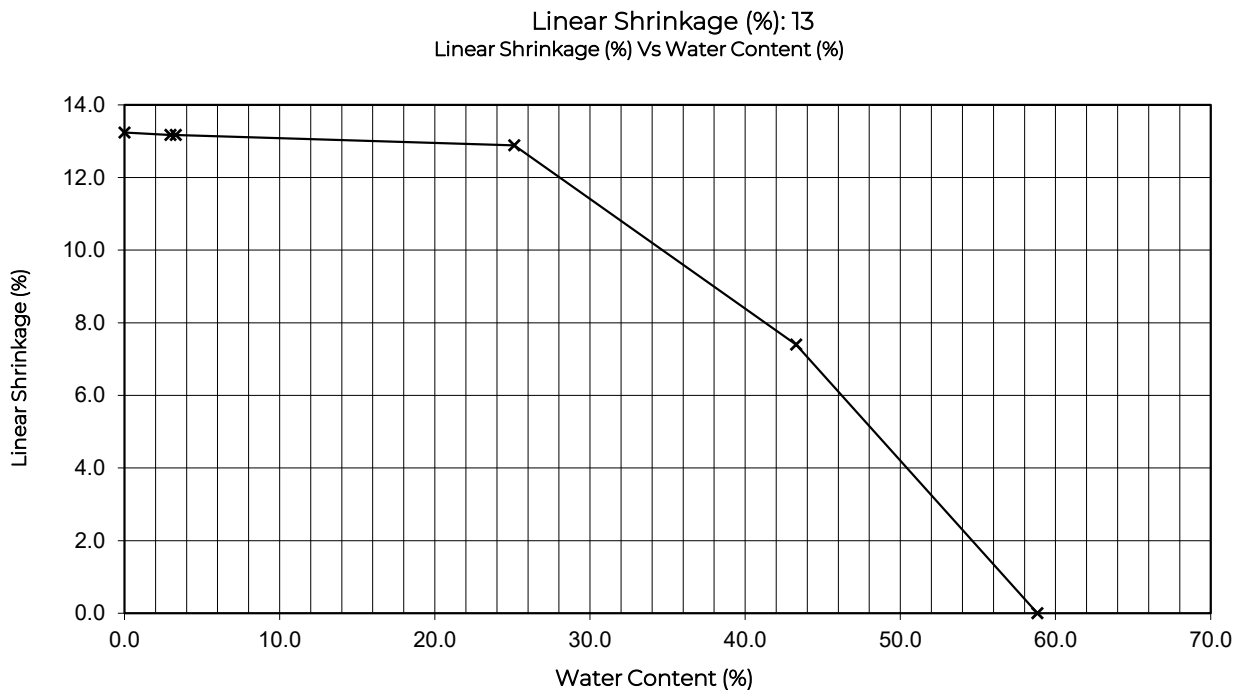


Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Clayey SILT with minor sand and traces of gravel
Sample condition: As Received
Sample reference: BH2B_1129
Sample depth (m): 3.00-3.45
Test specimen depth (m): 3.00-3.45
Date placed in mould: 29/10/2025

Date sampled: 2/10/25

Project number: 1-C2466.16
Lab ref number: WL4708/140_LS
Client ref number: 1-C2466.16
Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 29/10/25-06/11/25

This report may only be reproduced in full

Approved Signatory

Date : 17/11/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 16/09/25
Date received : 07/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/106_LS
Client Ref No :

Test Results

Sample Lab Ref No : WL4708/106_LS
Location ID : BH2B_1130
Sample Depth (m) : 3.00-3.45
Soil Fraction Tested : -425µm
Sample History : Unknown
Water Content as Rec'd (%) :
Water Content at LS test (%) : 59.1
Linear Shrinkage (%) : 21
Sample Description : Refer to borehole log

Test Methods

Water Content NZS 4402 : 1986, Test 2.1
Linear Shrinkage NZS 4402 : 1986, Test 2.6

Notes

Sample description is not IANZ endorsed.

Date tested : 08/10/25
Date reported : 13/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory
Rowan Carlyle
Designation : Laboratory Manager
Date : 09/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
Contractor : N/A
Sampled by : Unknown
Date sampled : 28 August 2025
Sampling method : SPT
Sample description : Refer to BH2B_1131 log report
Sample condition : As received
Date received : 23 September 2025

Project No : 1-C2466.16
Lab Ref No : WL4708/46
Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/46
Test pit no :	BH2B_1131
Depth :	3.00 - 3.45m
Linear shrinkage :	14%
Sample fraction :	<0.425mm
Date tested :	14/10/2025
Natural water content :	39.9%
Sample fraction :	Whole Soil
Date tested :	25/09/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description is not IANZ endorsed. All information supplied by client. This report may only be reproduced in full.

Date tested : 14 October 2025
Date reported : 22 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician
Date : 22 October 2025



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

LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 26 August 2025
Sampling method : SPT
Sample description : Refer to BH2B_1132 log report
Sample condition : As received
Date received : 23 September 2025

Project No : 1-C2466.16
Lab Ref No : WL4708/48-LS
Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/48
Test pit no :	BH2B_1132
Depth :	2.00 - 2.45m
Linear shrinkage :	17%
Sample fraction :	<0.425mm
Date tested :	21/10/2025
Natural water content :	36.6%
Sample fraction :	Whole Soil
Date tested :	11/10/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description is not IANZ endorsed. All information supplied by client. This report may only be reproduced in full.

Date tested : 21 October 2025
Date reported : 30 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician
Date : 30 October 2025



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 25/09/25
Date received : 10/10/25
Sampling method : Core
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/64-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/64-LS
Location ID :	BH2B_1133
Sample Depth (m) :	3.00-3.45
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	17.8
Water Content at LS test (%) :	39.6
Linear Shrinkage (%) :	7
Sample Description : WL4708/64-LS Refer to BH2B_1133 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 21/10/25
Date reported : 23/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 23/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE
TEST REPORT



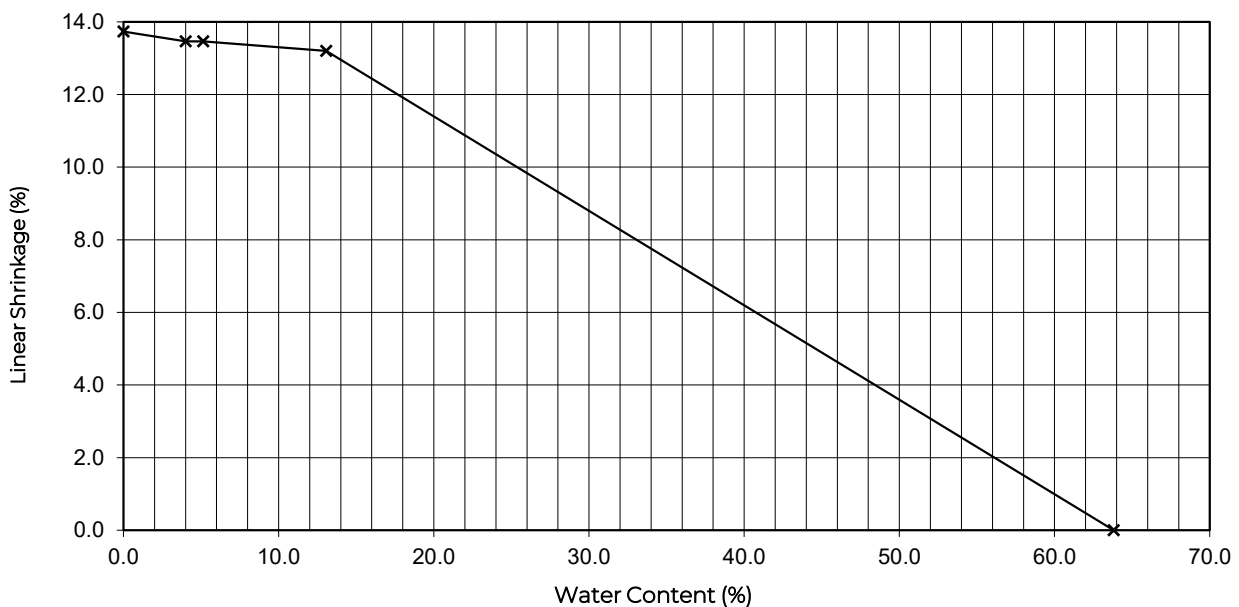
Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Clayey SILT with minor sand and traces of gravel
Sample condition: As Received
Sample reference: BH2B_1134
Sample depth (m): 1.50-1.95
Test specimen depth (m): 1.50-1.95
Date placed in mould: 7/11/2025

Date sampled: 7/10/25

Project number: 1-C2466.16
Lab ref number: WL4708/144_LS
Client ref number: 1-C2466.16
Order number: -

Test results

Linear Shrinkage (%): 14
Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 07-13/11/25

This report may only be reproduced in full

Approved Signatory

Date: 23/11/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 3 September 2025
Sampling method : SPT
Sample description : Clayey SILT with a trace of sand
Sample condition : As received
Date received : 23 September 2025

Project No : 1-C2466.16
Lab Ref No : WL4708/73-LS
Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/73
Test pit no :	BH2B_1135
Depth :	2.00 - 2.45m
Linear shrinkage :	18%
Sample fraction :	<0.425mm
Date tested :	21/10/2025
Natural water content :	24.6%
Sample fraction :	Whole Soil
Date tested :	14/10/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description in accordance with NZ Geotechnical Society Inc, notes. All information supplied by client. This report may only be reproduced in full.

Date tested : 21 October 2025
Date reported : 30 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician
Date : 30 October 2025



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

LINEAR SHRINKAGE TEST REPORT

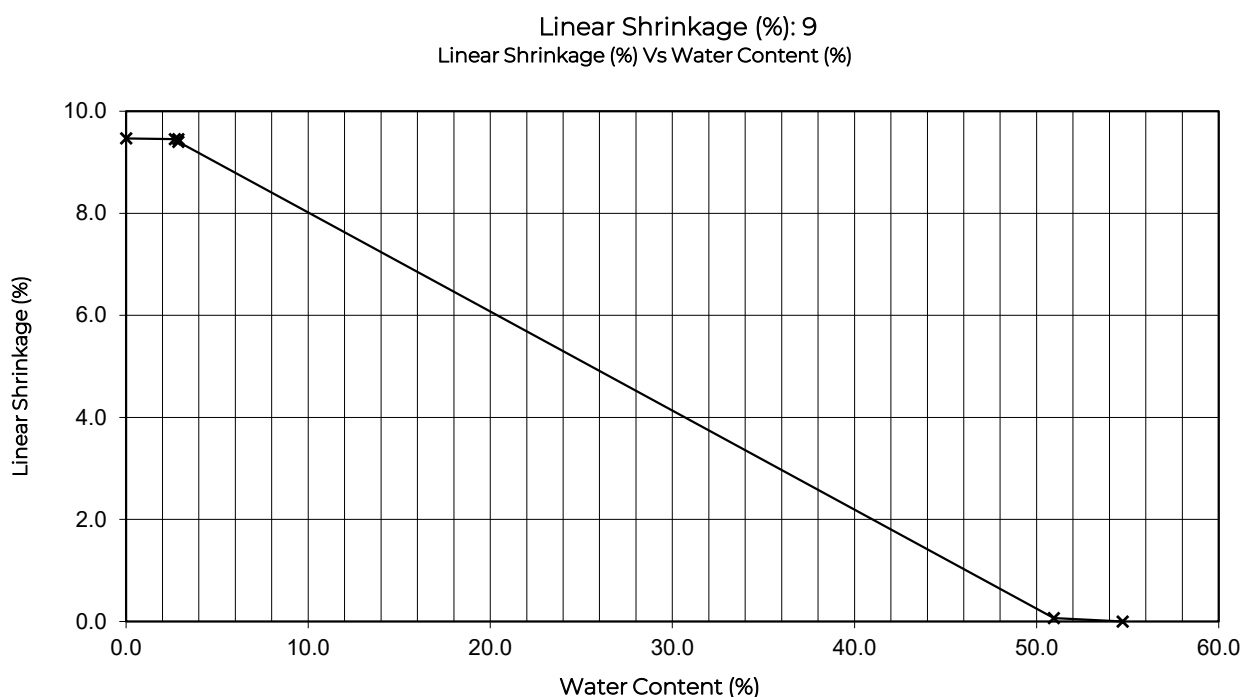


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand
 Sample condition: As Received
 Sample reference: BH2B_1136
 Sample depth (m): 4.50-4.95
 Test specimen depth (m): 4.50-4.95
 Date placed in mould: 04/12/25

Date sampled: 12/11/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/196_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 18 Blows in liquid limit bowl

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

Date tested: 04-11/12/25

Approved Signatory

Date : 23/12/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 30/09/25
Date received : 10/10/25
Sampling method : Core
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/133-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/133-LS
Location ID :	BH2B_1137
Sample Depth (m) :	5.00-5.45
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	52.5
Water Content at LS test (%) :	70.9
Linear Shrinkage (%) :	13
Sample Description : WL4708/133-LS Refer to BH2B_1137 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 22/10/25
Date reported : 23/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 23/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE TEST REPORT



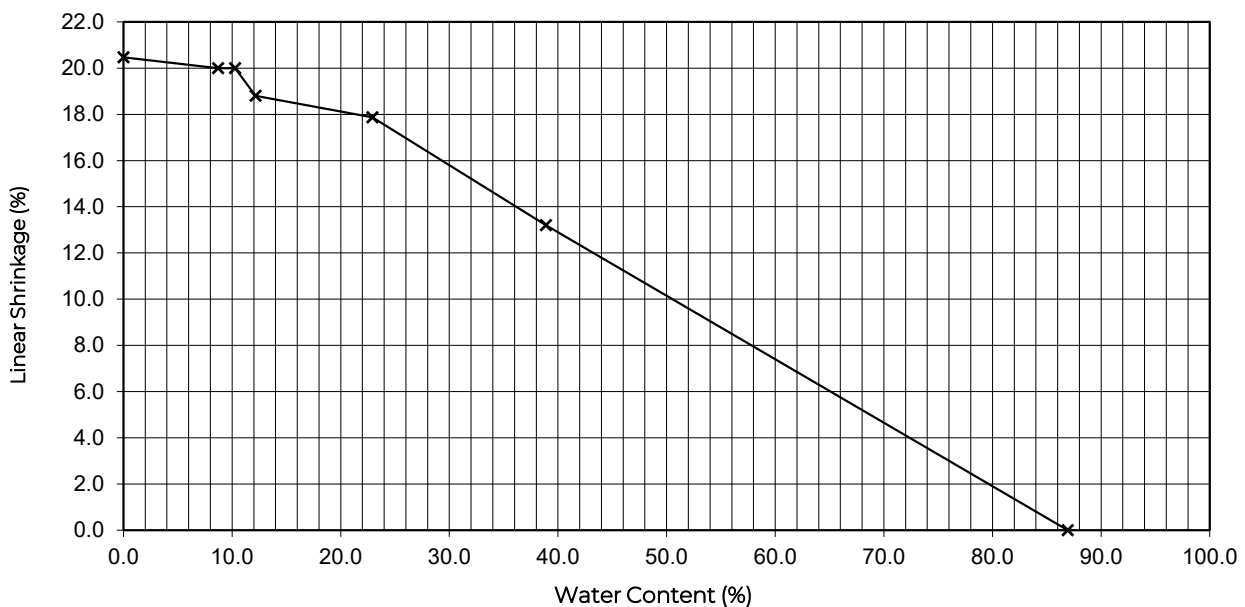
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand and minor gravel
 Sample condition: As Received
 Sample reference: BH2B_1139
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 03/10/25

Date sampled: 11/09/25

Project number: 1-C2466.16
 Lab ref number: WL4708/110_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 20
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 03-10/10/25

This report may only be reproduced in full

Approved Signatory

Date: 13/10/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
 Location : Section 2 Te Hana to Port Marsden Highway, Section 2B CI
 Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
 Contractor : N/A
 Sampled by : NC Site Team
 Date sampled : 10 September 2025
 Sampling method : SPT
 Sample description : Clayey SILT with minor sand
 Sample condition : As received
 Date received : 23 September 2025

Project No : 1-C2466.16
 Lab Ref No : WL4708/76-LS
 Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/76
Test pit no :	BH2B_1140
Depth :	3.50 - 3.95m
Linear shrinkage :	17%
Sample fraction :	<0.425mm
Date tested :	21/10/2025
Natural water content :	36.4%
Sample fraction :	Whole Soil
Date tested :	14/10/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description in accordance with NZ Geotechnical Society Inc, notes. All information supplied by client. This report may only be reproduced in full.

Date tested : 21 October 2025
 Date reported : 30 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician
 Date : 30 October 2025



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

LINEAR SHRINKAGE TEST REPORT



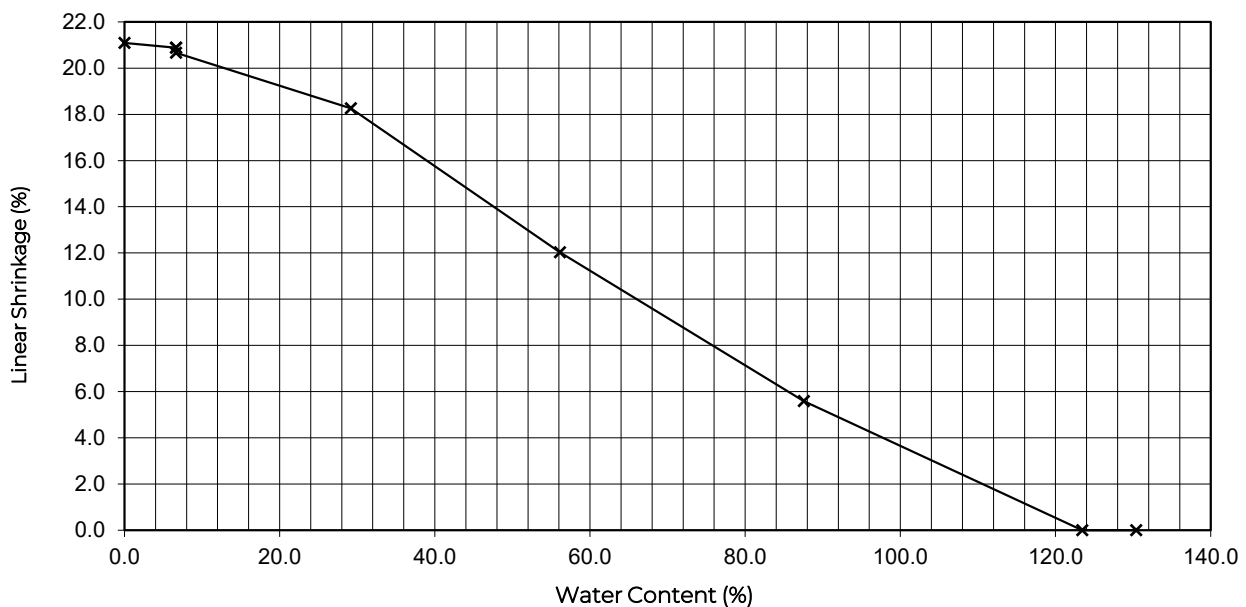
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT; dark brown mottled grey; saturated; plastic
 Sample condition: As Received
 Sample reference: BH2B_1142
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 10/11/2025

Date sampled: 3/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/148_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 21
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 10-20/11/25

This report may only be reproduced in full

Approved Signatory

Date : 23/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT



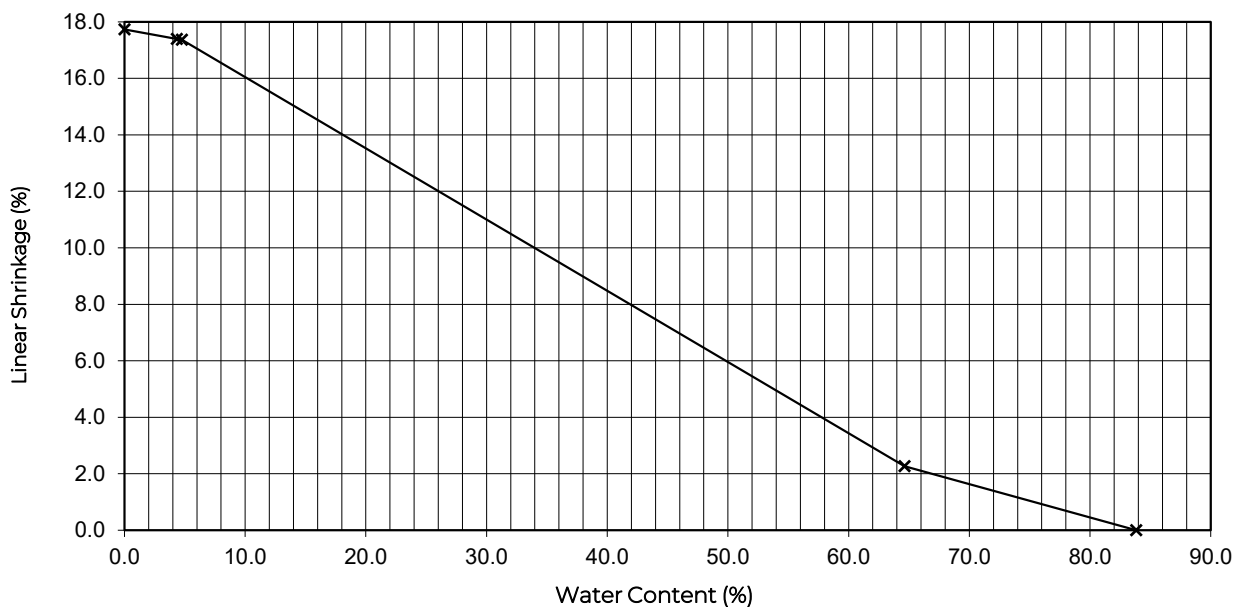
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Silty CLAY
 Sample condition: As Received
 Sample reference: BH2B_1143
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 20/11/25

Date sampled: 23/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/171_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 18
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 22 Blows in liquid limit bowl

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

Date tested: 20-26/11/25

This report may only be reproduced in full

Approved Signatory

Date : 26/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT

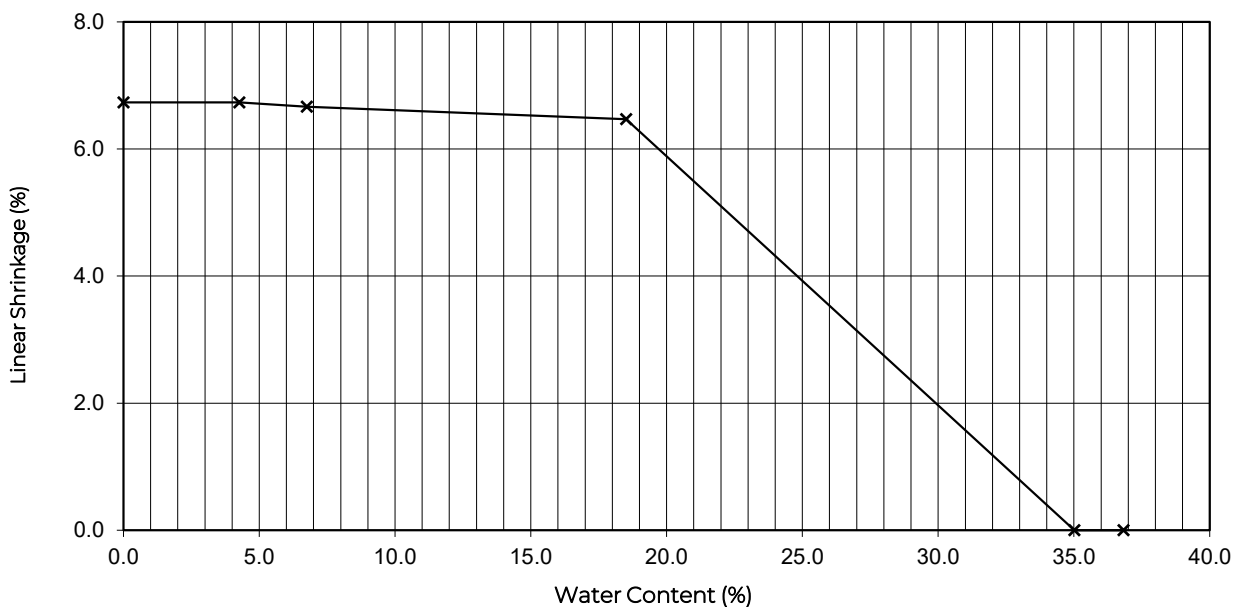


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Date sampled: 19/08/25
 Sampling method: SPT
 Sample description: SILT with some clay and sand, minor gravel
 Sample condition: As Received
 Sample reference: BH2B_1144
 Sample depth (m): 10.50-10.95
 Test specimen depth (m): 10.50-10.95
 Date placed in mould: 29/09/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/14_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 7
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 29/09/25-03/10/25

This report may only be reproduced in full

Approved Signatory

Date : 05/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT

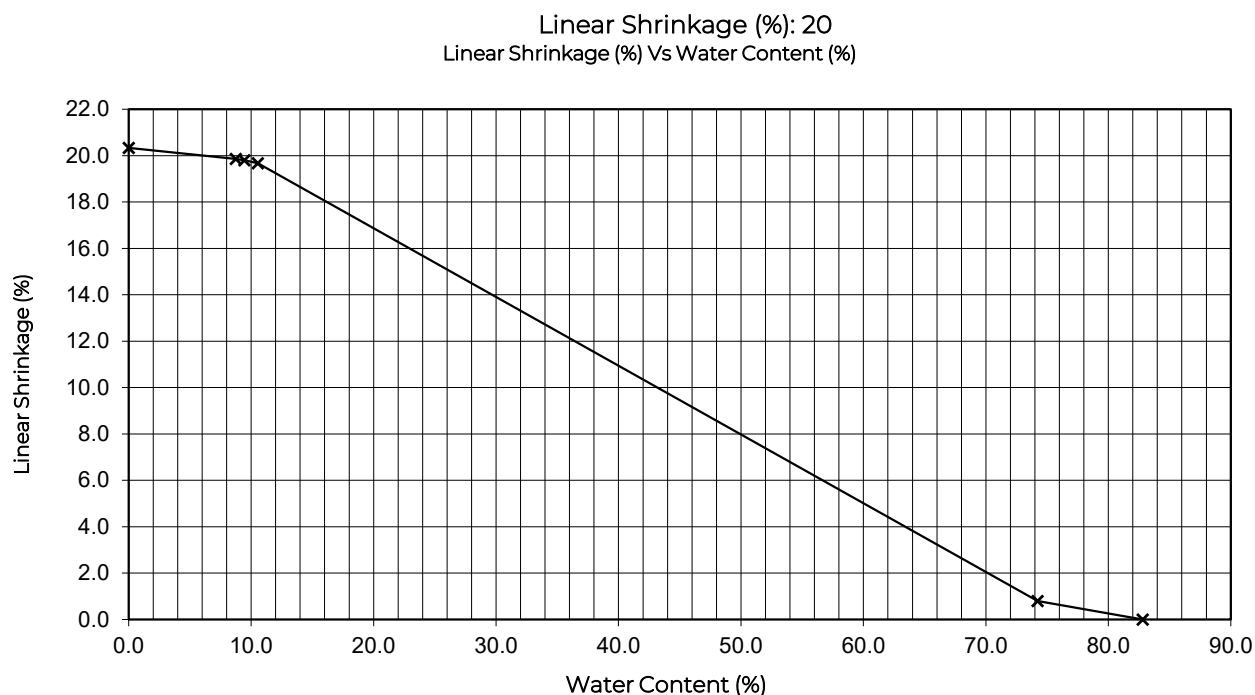


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: Pushtube
 Sample description: Silty CLAY with traces of sand
 Sample condition: As Received
 Sample reference: BH2B_1145
 Sample depth (m): 1.50-1.90
 Test specimen depth (m): 1.63-1.90
 Date placed in mould: 06/11/25

Date sampled: 2/09/25

Project number: 1-C2466.16
 Lab ref number: WL4708/114_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 06-13/11/25

This report may only be reproduced in full

Approved Signatory

Thirushen Pillay
 Senior Civil Engineering Technician

Date : 19/11/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT

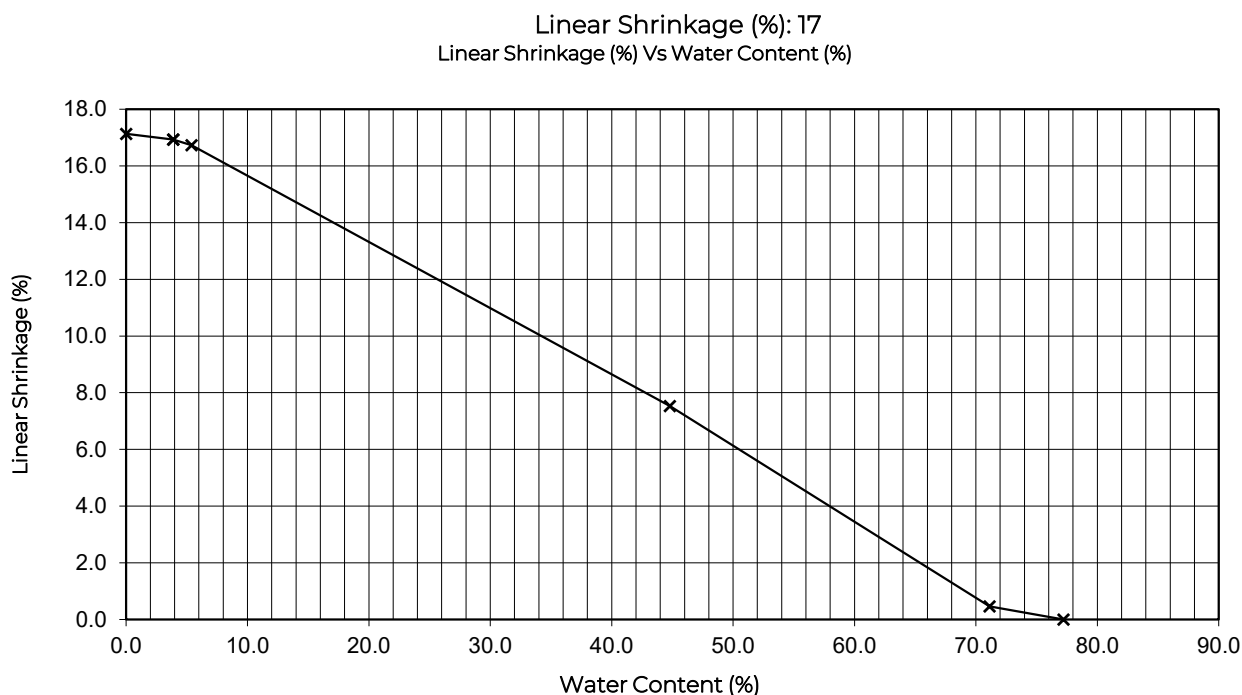


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand and minor gravel
 Sample condition: As Received
 Sample reference: BH2B_1146
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 08/01/26

Date sampled: 24/11/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/207_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 17 Blows in liquid limit bowl

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

Date tested: 08-14/01/26

Approved Signatory

Date: 16/01/26

Thrushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 17/09/25
Date received : 07/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/115_LS
Client Ref No :

Test Results

Sample Lab Ref No : WL4708/115.PI
Location ID : BH2B_1147
Sample Depth (m) : 1.50-1.95
Soil Fraction Tested : -425µm
Sample History : Unknown
Water Content as Rec'd (%) :
Water Content at LS test (%) : 96.1
Linear Shrinkage (%) : 13
Sample Description : Refer to borehole log

Test Methods

Water Content NZS 4402 : 1986, Test 2.1
Linear Shrinkage NZS 4402 : 1986, Test 2.6

Notes

Sample description is not IANZ endorsed.

Date tested : 08/10/25
Date reported : 13/10/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory
Rowan Carlyle
Designation : Laboratory Manager
Date : 09/10/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
 Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
 Contractor : N/A
 Sampled by : NC Site Team
 Date sampled : 10 September 2025
 Sampling method : SPT
 Sample description : Silty CLAY with some sand & a trace of gravel
 Sample condition : As received
 Date received : 23 September 2025

Project No : 1-C2466.16
 Lab Ref No : WL4708/90-LS
 Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/90
Test pit no :	BH2B_1148
Depth :	4.50 - 4.95m
Linear shrinkage :	10%
Sample fraction :	<0.425mm
Date tested :	28/10/2025
Natural water content :	44.6%
Sample fraction :	Whole Soil
Date tested :	13/10/2025

Test Methods	Notes
Water Content Linear Shrinkage	NZS 4402 : 1986, Test 2.1 NZS 4402 : 1986, Test 2.6
	Sample description in accordance with NZ Geotechnical Society Inc, notes. All information supplied by client. This report may only be reproduced in full.

Date tested : 28 October 2025
 Date reported : 28 October 2025

Approved Signatory 
 Designation : Intermediate Laboratory Technician
 Date : 28 October 2025



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

LINEAR SHRINKAGE TEST REPORT

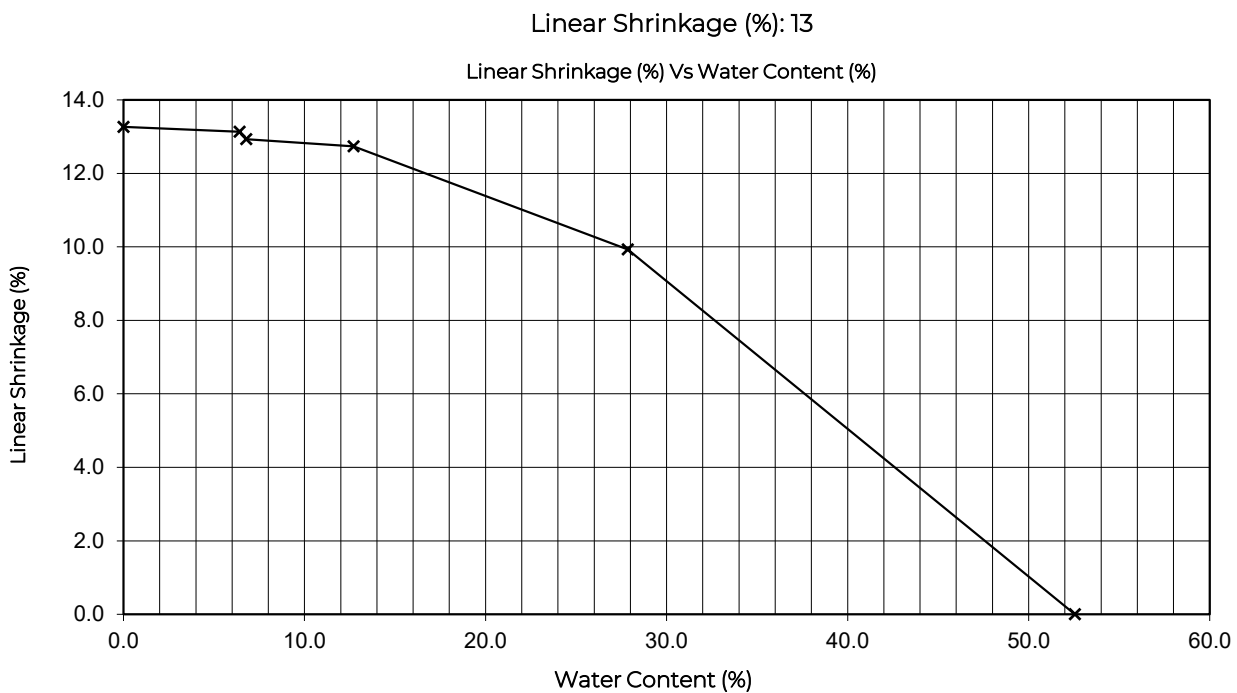


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with traces of sand
 Sample condition: As Received
 Sample reference: BH2B_1149
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 19/09/25

Date sampled: 25/08/25

Project number: 1-C2466.16
 Lab ref number: WL4708/16_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 17 Blows in liquid limit bowl

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

Date tested: 19-25/09/2025

This report may only be reproduced in full

Approved Signatory

Date : 03/10/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT



Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Clayey SILT with some sand
Sample condition: As Received
Sample reference: BH2B_1150
Sample depth (m): 2.50-2.95
Test specimen depth (m): 2.50-2.95
Date placed in mould: 18/09/25

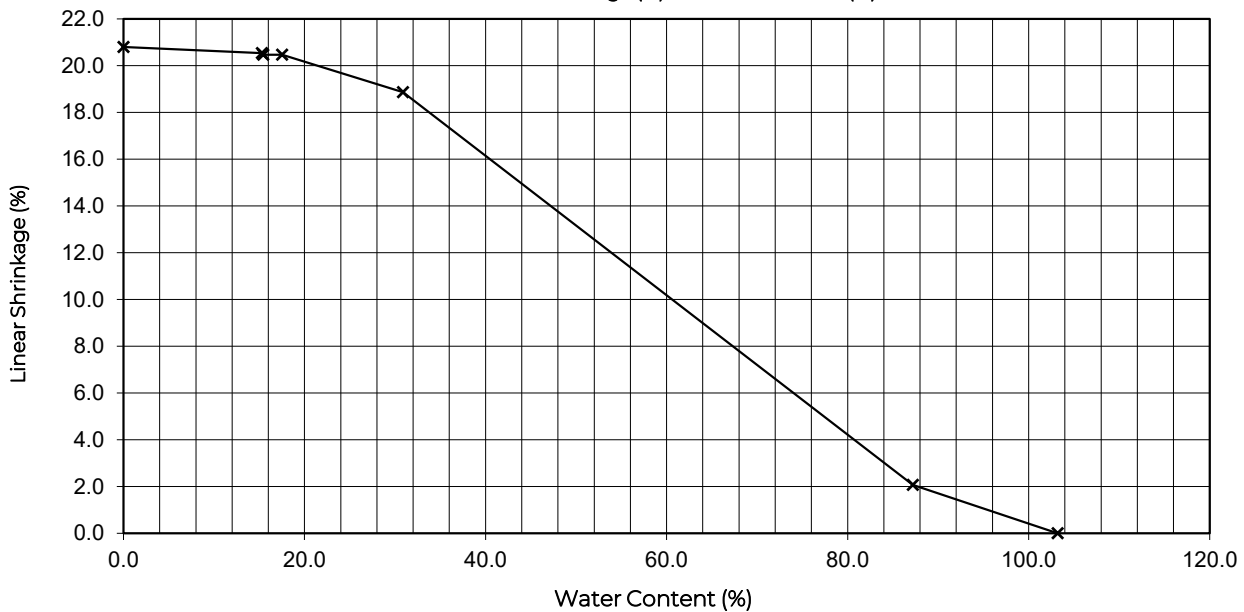
Date sampled: 18/08/25

Project number: 1-C2466.16
Lab ref number: WL4708/18_LS
Client ref number: 1-C2466.16
Order number: -

Test results

Linear Shrinkage (%): 21

Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 19 Blows in liquid limit bowl

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

Date tested: 18-25/09/2025

This report may only be reproduced in full

Approved Signatory

Date : 03/10/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT



Project : Ground Investigations For Northland Corridor
 Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client : NZTA C/- Aurecon Ltd & WSP NZ Ltd
 Contractor : N/A
 Sampled by : NC Site Team
 Date sampled : 10 September 2025
 Sampling method : SPT
 Sample description : Refer to BH2B_1151 log report
 Sample condition : As received
 Date received : 23 September 2025

Project No : 1-C2466.16
 Lab Ref No : WL4708/94-LS
 Client Ref No : 1-C2466.16

Test Results	
Lab reference :	WL4708/94
Test pit no :	BH2B_1151
Depth :	6.00 - 6.45m
Linear shrinkage :	15%
Sample fraction :	<0.425mm
Date tested :	21/10/2025
Natural water content :	41.2%
Sample fraction :	Whole Soil
Date tested :	21/10/2025

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1	Sample description is not IANZ endorsed. All information supplied by client. This report may only be reproduced in full.
Linear Shrinkage NZS 4402 : 1986, Test 2.6	

Date tested : 30 October 2025

Date reported : 31 October 2025

Approved Signatory

Designation : Intermediate Laboratory Technician

Date : 31 October 2025



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LINEAR SHRINKAGE TEST REPORT



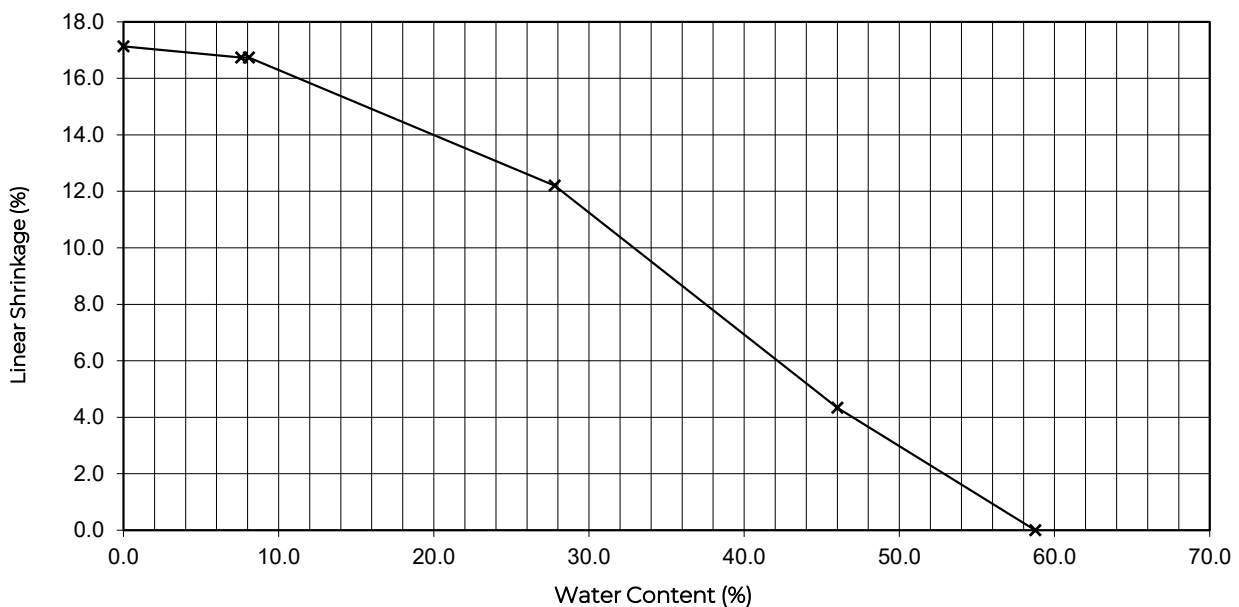
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with traces of sand and gravel
 Sample condition: As Received
 Sample reference: BH2B_1152
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 08/10/25

Date sampled: 11/09/25

Project number: 1-C2466.16
 Lab ref number: WL4708/98_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 17
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 08-14/10/25

This report may only be reproduced in full

Approved Signatory

Thirushen Pillay
 Senior Civil Engineering Technician

Date: 17/10/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigation for Northland Corridor
Location : Alternative to Brynderwyn Hills Section
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : N/A
Sampled by : NC Site Team
Date sampled : 04/11/25
Date received : 25/11/25
Sampling method : SPT
Sample condition : Natural; as excavated

Project No : 1-C21466.16
Lab Ref No : WL4708/186_LS
Client Ref No :

Test Results

Sample Lab Ref No : WL4708/186_LS
Location ID : BH2B_1153
Sample Depth (m) : 6.00-6.45
Soil Fraction Tested : -425µm
Sample History : Unknown
Water Content as Rec'd (%) : 37.5
Water Content at LS test (%) : 56.1
Linear Shrinkage (%) : 6
Sample Description : Silty CLAY with minor sand and traces of gravel

Test Methods

Water Content NZS 4402 : 1986, Test 2.1
Linear Shrinkage NZS 4402 : 1986, Test 2.6

Notes

Sample description is not IANZ endorsed.

Date tested : 27/11/25
Date reported : 02/12/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

Approved Signatory 
Rowan Carlyle
Designation : Laboratory Manager
Date : 28/11/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE TEST REPORT



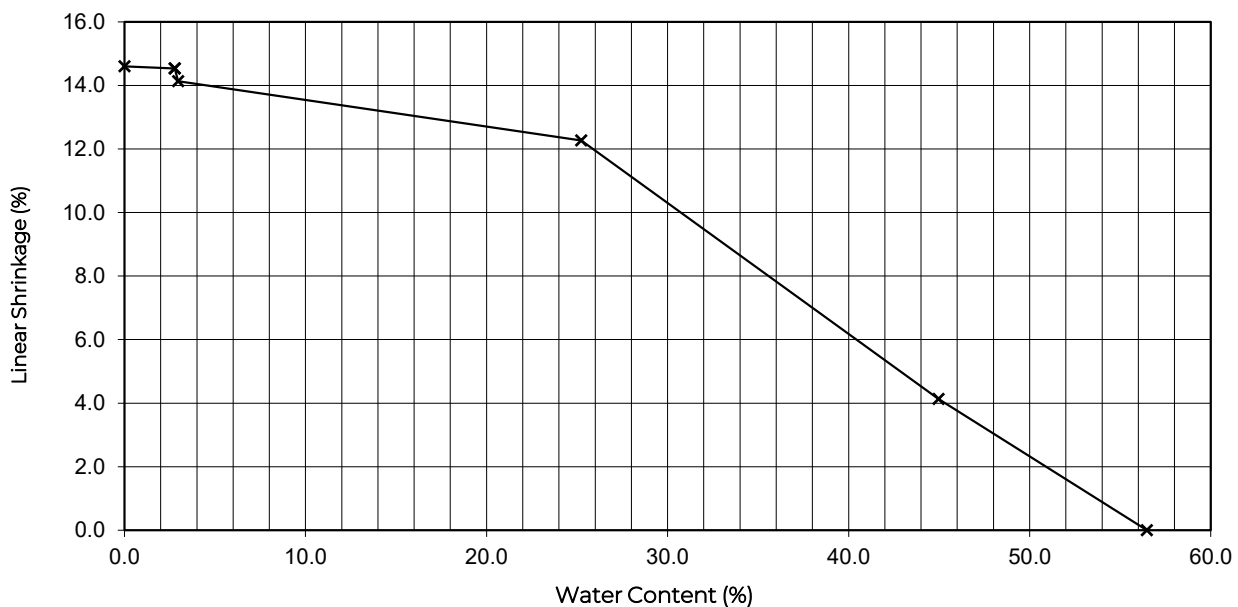
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with some sand and minor gravel
 Sample condition: As Received
 Sample reference: BH2B_1154
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 19/11/25

Date sampled: 23/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/175_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 15
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 20-26/11/25

This report may only be reproduced in full

Approved Signatory

Date: 26/11/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT



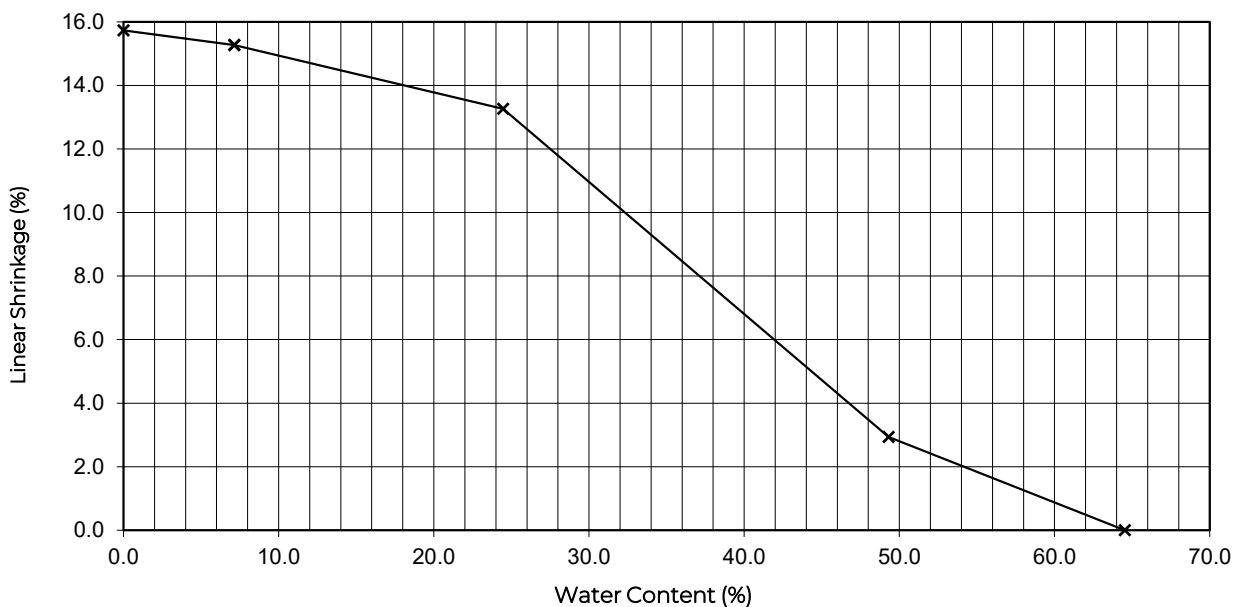
Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Silty CLAY with traces of sand
 Sample condition: As Received
 Sample reference: BH2B_1155
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 12/11/25

Date sampled: 21/10/25

Project number: 1-C2466.16
 Lab ref number: WL4708/178_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results

Linear Shrinkage (%): 16
 Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 06-13/11/25

This report may only be reproduced in full

Approved Signatory

Date : 23/11/25

Thrushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT

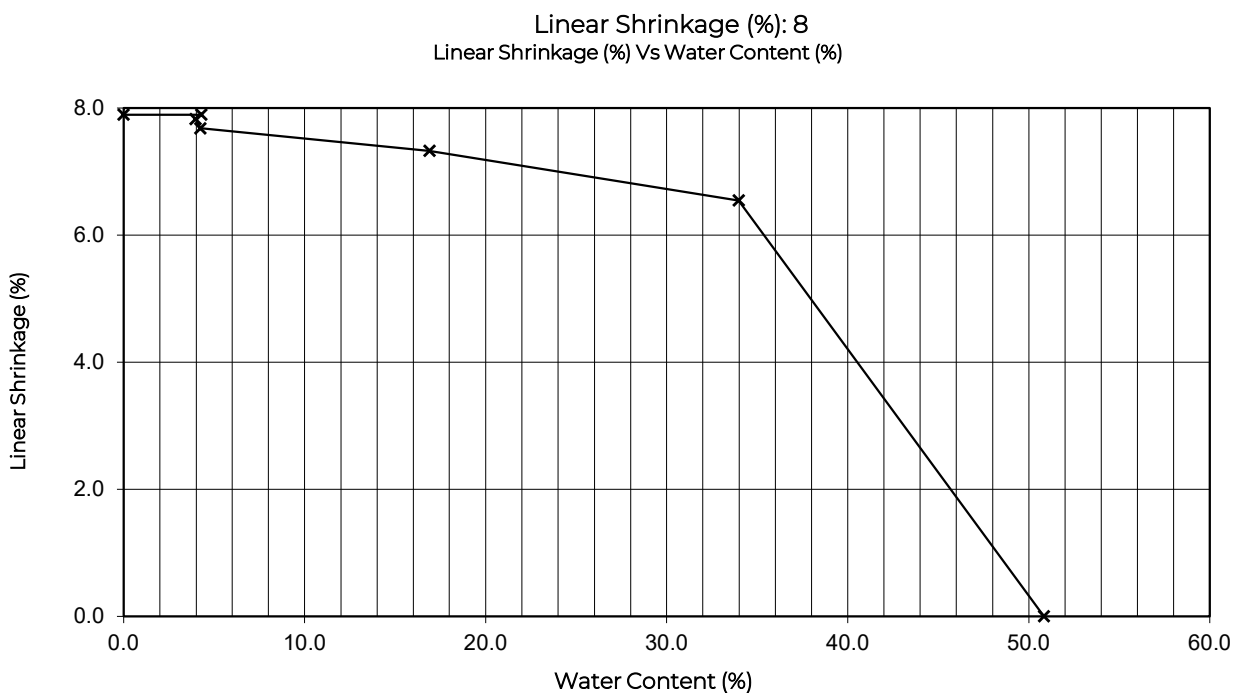


Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: SILT with some clay and sand
 Sample condition: As Received
 Sample reference: BH2B_1157
 Sample depth (m): 4.50-4.95
 Test specimen depth (m): 4.50-4.95
 Date placed in mould: 19/11/25

Date sampled: 23/10/25

Project number:	1-C2466.16
Lab ref number:	WL4708/181_LS
Client ref number:	1-C2466.16
Order number:	-

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 16 Blows in liquid limit bowl

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

Date tested: 20-26/11/25

This report may only be reproduced in full

Approved Signatory

Date : 26/11/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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WSP
Auckland Laboratory
Quality Management Systems Certified to ISO 9001

7a Ride Way, Albany
Private Bag 101982, NS Mail Centre, North
Shore City 0745, New Zealand

Telephone +64 9 415 4660
Website www.wsp.com/nz

LINEAR SHRINKAGE TEST REPORT

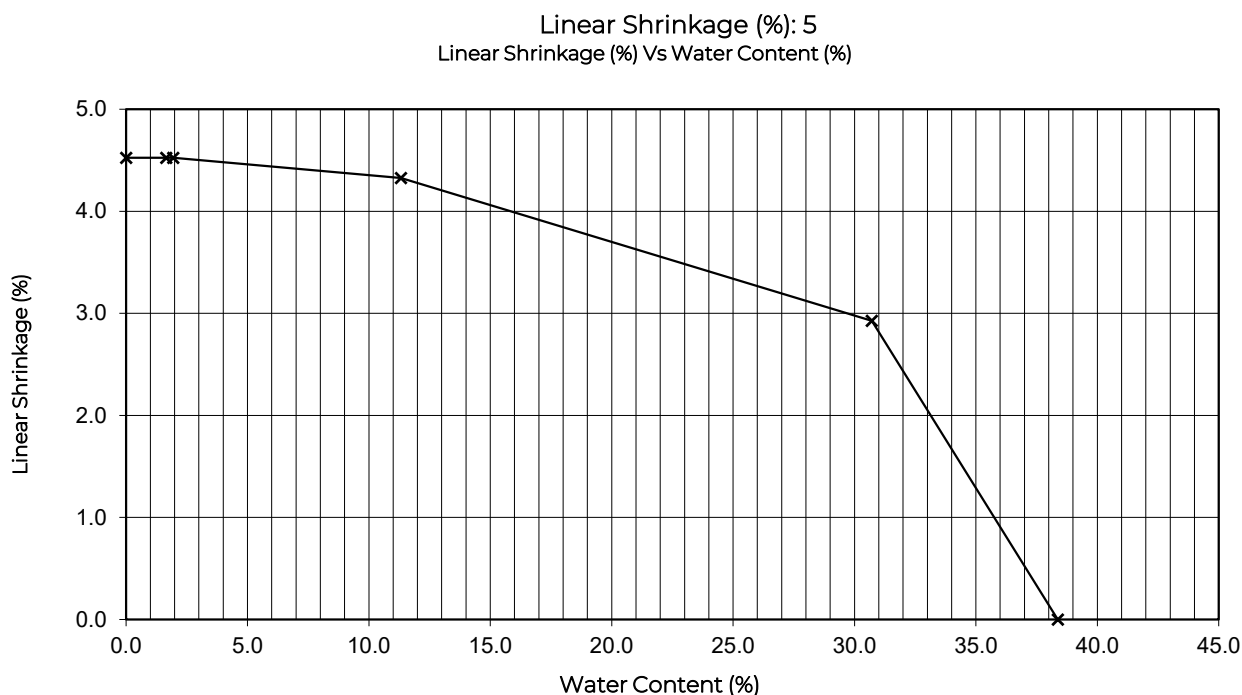


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Silty SAND with minor clay
 Sample condition: As Received
 Sample reference: BH2B_1159
 Sample depth (m): 3.00-3.45
 Test specimen depth (m): 3.00-3.45
 Date placed in mould: 15/12/25

Date sampled: 11/11/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/212_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Cone penetration limit
- Sample placed in mould at 20mm Cone penetration

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

Date tested: 04-11/12/25

Approved Signatory

Date : 07/01/26

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE
TEST REPORT



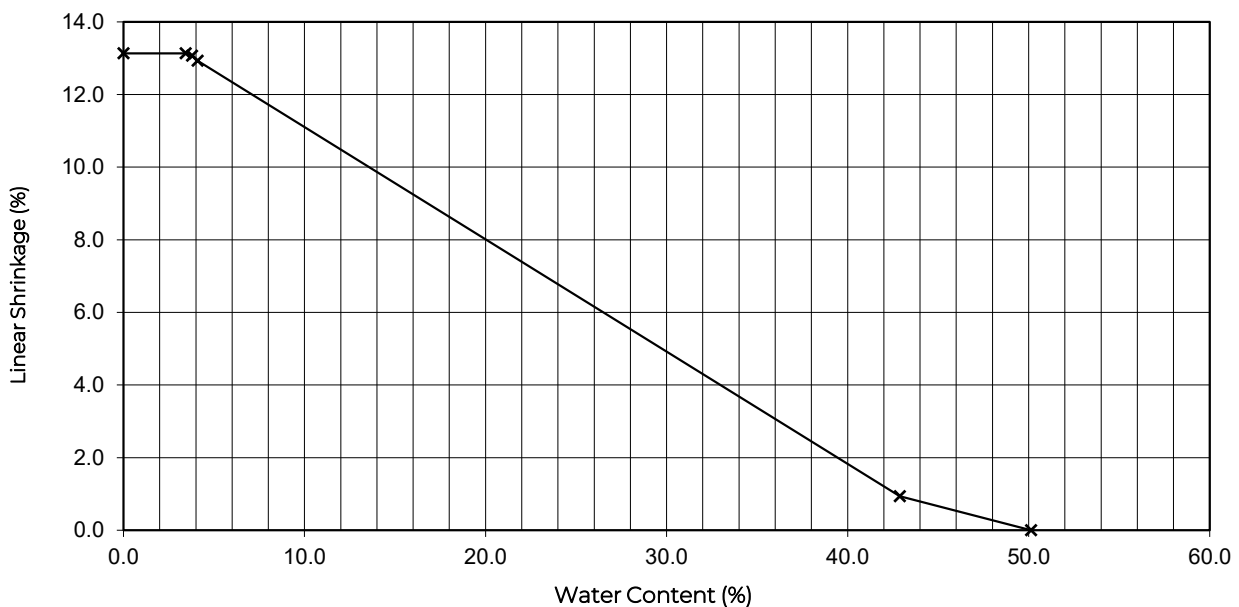
Project: Ground Investigation for Northland Corridor
Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client: NZTA C/- Aurecon & WSP NZ Ltd.
Contractor: N/A
Sampled by: NC Site Team
Sampling method: SPT
Sample description: Clayey SILT with minor sand
Sample condition: As Received
Sample reference: BH2B_1160
Sample depth (m): 4.50-4.95
Test specimen depth (m): 4.50-4.95
Date placed in mould: 06/11/25

Date sampled: 10/10/25

Project number: 1-C2466.16
Lab ref number: WL4708/157_LS
Client ref number: 1-C2466.16
Order number: -

Test results

Linear Shrinkage (%): 13
Linear Shrinkage (%) Vs Water Content (%)



Test Methods

Linear Shrinkage: NZS 4402: 1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 18 Blows in liquid limit bowl

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

Date tested: 06-13/11/25

This report may only be reproduced in full

Approved Signatory

Date: 23/11/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE TEST REPORT

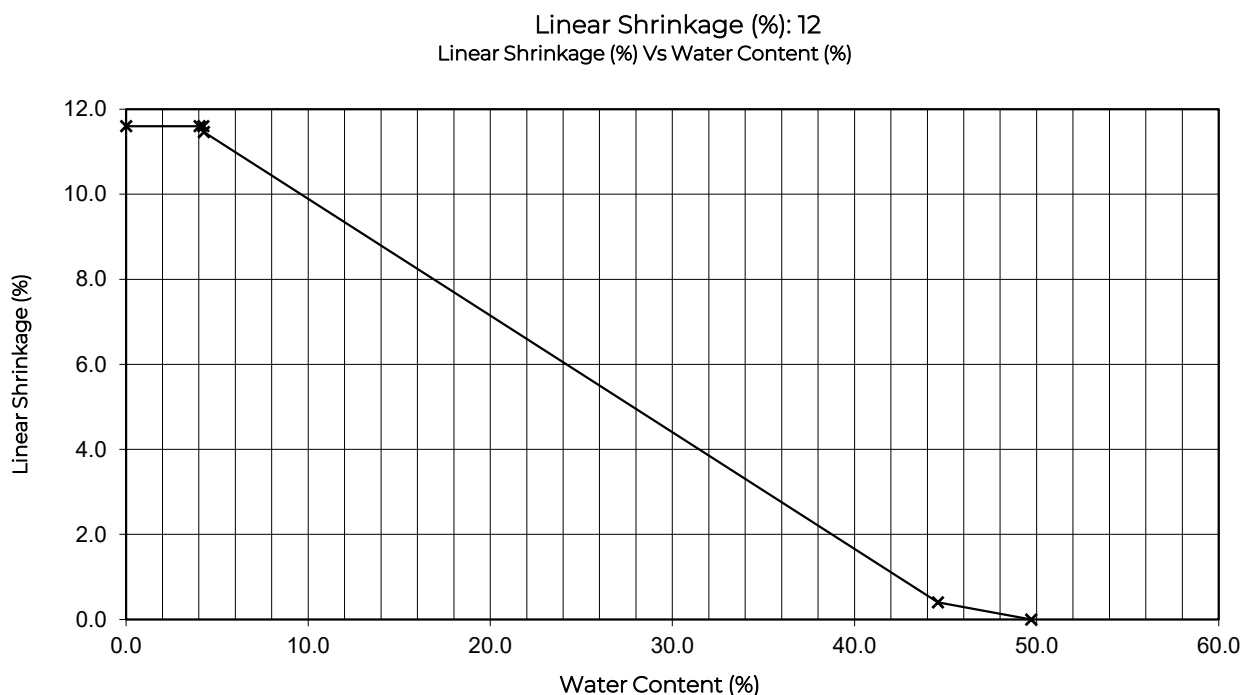


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: Clayey SILT with minor sand and traces of gravel
 Sample condition: As Received
 Sample reference: BH2B_1161
 Sample depth (m): 6.00-6.45
 Test specimen depth (m): 6.00-6.45
 Date placed in mould: 04/12/25

Date sampled: 12/11/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/199_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Liquid limit
- Sample placed in mould at 21 Blows in liquid limit bowl

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

Date tested: 04-11/12/25

Approved Signatory

Date : 23/12/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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WSP
 Auckland Laboratory
 Quality Management Systems Certified to ISO 9001

7a Ride Way, Albany
 Private Bag 101982, NS Mail Centre, North
 Shore City 0745, New Zealand

Telephone +64 9 415 4660
 Website www.wsp.com/nz

LINEAR SHRINKAGE TEST REPORT

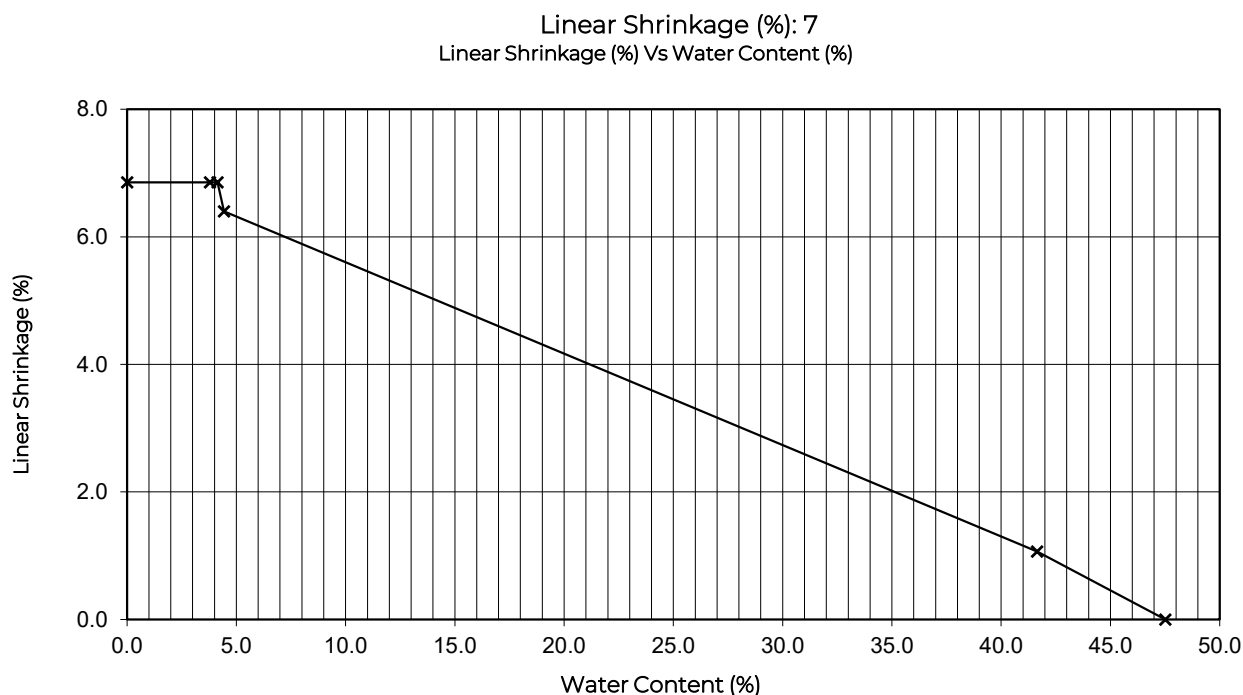


Project: Ground Investigation for Northland Corridor
 Location: Alternative to Brynderwyn Hills Section
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Sampling method: SPT
 Sample description: SILT with some clay and sand
 Sample condition: As Received
 Sample reference: BH2B_1162
 Sample depth (m): 3.50-3.95
 Test specimen depth (m): 3.50-3.95
 Date placed in mould: 04/12/25

Date sampled: 29/10/2025

Project number: 1-C2466.16
 Lab ref number: WL4708/188_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods

Linear Shrinkage: NZS 4402:1986: Test 2.6

Notes

- Sample Descriptions are not covered by IANZ accreditation.
- Test performed on: Fraction passing 425µm
- Sample history: Unknown
- Plasticity Index method used: Cone penetration limit
- Sample placed in mould at 19.45mm Cone penetration

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

Date tested: 04-11/12/25

Approved Signatory

Date : 23/12/25

Thirushen Pillay
 Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 20/10/25
Date received : 31/10/25
Sampling method : SPT
Sample condition : As received

Project No : 1-C2466.16
Lab Ref No : WL4708/165-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4708/165-LS
Location ID :	BH2B_1164
Sample Depth (m) :	4.70-5.15
Soil Fraction Tested :	-425µm
Sample History :	Unknown
Water Content as Rec'd (%) :	28.9
Water Content at LS test (%) :	47.1
Linear Shrinkage (%) :	7
Sample Description : WL4708/165-LS Refer to BH2B_1164 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 17/11/25
Date reported : 21/11/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full

Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 21/11/25



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 27/09/25
Date received : 27/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/6-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/6-LS
Location ID :	TP2B_1101
Sample Depth (m) :	0.7-1.0
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	48.9
Water Content at LS test (%) :	73.5
Linear Shrinkage (%) :	16
Sample Description : WL4709/6-LS Refer to TP2B_1101 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 04/11/25

Date reported : 06/11/25

Approved Signatory

Designation : Laboratory Manager

Date : 14/11/25

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

This report may only be reproduced in full

All information supplied by Client



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 23/09/25
Date received : 03/10/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/7-LS
Client Ref No : -

Test Results

Sample Lab Ref No : WL4709/7-LS
Location ID : TP2B_1102
Sample Depth (m) : 1.0-1.5
Soil Fraction Tested : -425µm
Sample History : Natural
Water Content as Rec'd (%) :
Water Content at LS test (%) : 55.2
Linear Shrinkage (%) : 16

Sample Description : WL4709/7-LS Refer to TP2B_1102 log report

Test Methods

Linear Shrinkage NZS 4402:1986, Test 2.6

Notes

Sample description is not IANZ endorsed.

Date tested : 08-10/10/25

Date reported : 17/10/25

Approved Signatory

Designation : Laboratory Manager

Date : 17/10/25

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

This report may only be reproduced in full

All information supplied by Client



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 27/09/25
Date received : 27/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/9-LS
Client Ref No : -

Test Results

Sample Lab Ref No : WL4709/9-LS
Location ID : TP2B_1103
Sample Depth (m) : 1.50-1.80
Soil Fraction Tested : Whole
Sample History : Natural
Water Content as Rec'd (%) : 38.0
Water Content at LS test (%) : 45.9
Linear Shrinkage (%) : 10

Note: Sample unsuitable to test
in Casagrande bowl (slipping).
Changed to CPL testing

Sample Description : WL4709/9-LS

Refer to TP2B_1103 log report

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 12/11/25
Date reported : 19/01/26

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

This report may only be reproduced in full

All information supplied by Client

Approved Signatory

Designation : Laboratory Manager
Date : 19/01/26



Test results indicated as not
accredited are outside the
scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 25/09/25
Date received : 03/10/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/11-LS
Client Ref No : -

Test Results

Sample Lab Ref No : WL4709/11-LS
Location ID : TP2B_1104
Sample Depth (m) : 2.00-3.00
Soil Fraction Tested : -425µm
Sample History : Natural
Water Content as Rec'd (%) : 51.3
Water Content at LS test (%) : 69.5
Linear Shrinkage (%) : 17

Sample Description : WL4709/11-LS Refer to TP2B_1104 log report

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 10-14/10/25
Date reported : 17/10/25

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

Designation : Laboratory Manager
Date : 17/10/25



Test results indicated as not
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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2B - Brynderwyn to Marsden Point
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 27/09/25
Date received : 03/10/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/12-LS
Client Ref No : -

Test Results

Sample Lab Ref No : WL4709/12-LS
Location ID : TP2B_1107
Sample Depth (m) : 4.50-5.00
Soil Fraction Tested : -425µm
Sample History : Natural
Water Content as Rec'd (%) : 27.7
Water Content at LS test (%) : 77.6
Linear Shrinkage (%) : 18

Sample Description : WL4709/12-LS Refer to TP2B_1107 log report

Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 10-14/10/25
Date reported : 17/10/25

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

Designation : Laboratory Manager
Date : 17/10/25



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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : N/P
Date received : N/P
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/26-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/26-LS
Location ID :	TP2B_1108
Sample Depth (m) :	0.5-1.0
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	42.1
Water Content at LS test (%) :	101.5
Linear Shrinkage (%) :	23
Sample Description : WL4709/26-LS Refer to TP2B_1108 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 24/10/25

Date reported : 31/10/25

Approved Signatory

Designation : Laboratory Manager

Date : 14/11/25

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

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 22/09/25
Date received : 03/10/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/15-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/15-LS
Location ID :	TP2B_1109
Sample Depth (m) :	3.50-4.00
Soil Fraction Tested :	-425µm
Sample History :	Natural
Water Content as Rec'd (%) :	40.1
Water Content at LS test (%) :	42.5
Linear Shrinkage (%) :	16
Sample Description : WL4709/15-LS Refer to TP2B_1109 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 13-14/10/25
Date reported : 20/10/25

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All information supplied by Client

Approved Signatory

Designation : *Laboratory Manager*
Date : 21/10/25



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scope of the laboratory's
accreditation

LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 27/09/25
Date received : 27/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/16-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/16-LS
Location ID :	TP2B_1110
Sample Depth (m) :	2.0-2.5
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	17.9
Water Content at LS test (%) :	43.7
Linear Shrinkage (%) :	11
Sample Description : WL4709/16-LS Refer to TP2B_1110 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 04/11/25
Date reported : 06/11/25

Approved Signatory

Designation : Laboratory Manager
Date : 14/11/25

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Section 2 Te Hana to Port Marsden Highway, Section 2B GI
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 18/09/25
Date received : 03/10/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/18-LS
Client Ref No : -

Test Results		
Sample Lab Ref No :	WL4709/18-LS	Note: Material slipped in Casagrande bowl. Cone Penetration test used
Location ID :	TP2B_1113	
Sample Depth (m) :	4.20-4.50	
Soil Fraction Tested :	-425µm	
Sample History :	Natural	
Water Content as Rec'd (%) :	42.4	
Water Content at LS test (%) :	55.0	
Linear Shrinkage (%) :	11	
Sample Description : WL4709/18-LS Refer to TP2B_1113 log report		
Test Methods		Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6		Sample description is not IANZ endorsed.

Date tested : 13-14/10/25
Date reported : 20/10/25

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

Designation : *Laboratory Manager*
Date : 21/10/25



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

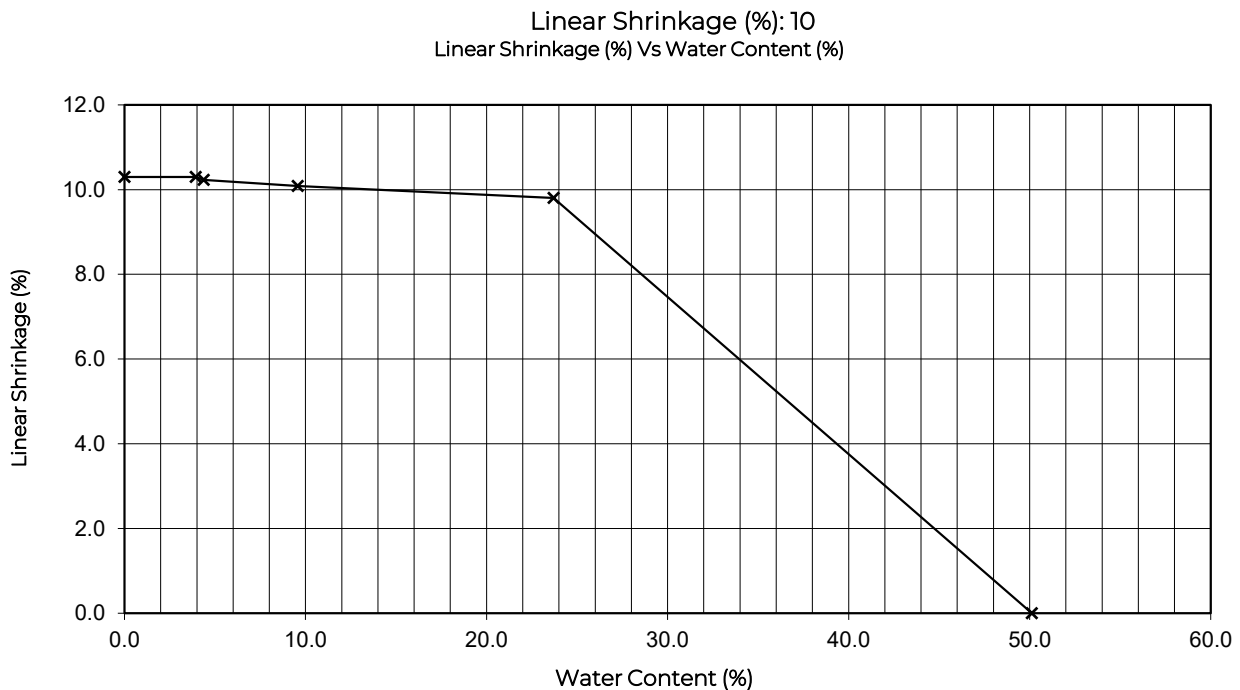
LINEAR SHRINKAGE TEST REPORT



Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Date sampled: 15/09/25
 Sampling method: Digger
 Sample description: Clayey SILT with minor sand and traces of gravel
 Sample condition: As Received
 Sample reference: TP2B-1114
 Sample depth (m): 1.90-2.60
 Test specimen depth (m): 1.90-2.60
 Date placed in mould: 03/10/25

Project number: 1-C2466.16
 Lab ref number: WL4709/2_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 15 Blows in liquid limit bowl

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

Date tested: 03-09/10/25

This report may only be reproduced in full

Approved Signatory

Date : 26/10/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 25/09/25
Date received : 25/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/20-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/20-LS
Location ID :	TP2B_1119
Sample Depth (m) :	1.5-2.0
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	59.9
Water Content at LS test (%) :	111.8
Linear Shrinkage (%) :	21
Sample Description : WL4709/20-LS Refer to TP2B_1119 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 24/10/25
Date reported : 31/10/25

Approved Signatory

Designation : *Laboratory Manager*
Date : 14/11/25

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 25/09/25
Date received : 25/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/22-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/22-LS
Location ID :	TP2B_1120
Sample Depth (m) :	2.7-3.2
Soil Fraction Tested :	Whole
Sample History :	Natural
Water Content as Rec'd (%) :	47.1
Water Content at LS test (%) :	67.4
Linear Shrinkage (%) :	16
Sample Description : WL4709/22-LS Refer to TP2B_1120 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 06/11/25
Date reported : 07/11/25

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

Designation : Laboratory Manager
Date : 14/11/25



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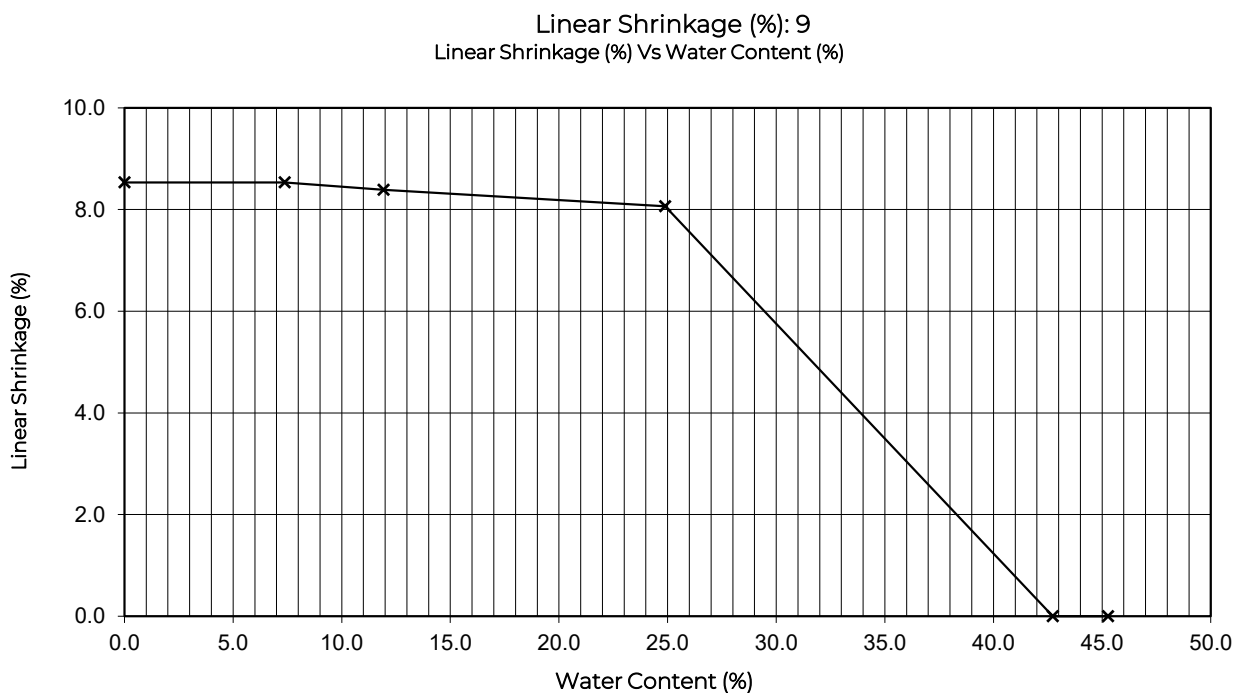
LINEAR SHRINKAGE TEST REPORT



Project: Ground Investigation for Northland Corridor
 Location: Section 2 Te Hana to Port Marsden Highway, Section 2B GI
 Client: NZTA C/- Aurecon & WSP NZ Ltd.
 Contractor: N/A
 Sampled by: NC Site Team
 Date sampled: 15/09/25
 Sampling method: Digger
 Sample description: Clayey SILT with some sand and traces of gravel
 Sample condition: As Received
 Sample reference: TP2B-1121
 Sample depth (m): 1.90-2.50
 Test specimen depth (m): 1.90-2.50
 Date placed in mould: 27/09/25

Project number: 1-C2466.16
 Lab ref number: WL4709/4_LS
 Client ref number: 1-C2466.16
 Order number: -

Test results



Test Methods	Notes
Linear Shrinkage: NZS 4402: 1986: Test 2.6	-Sample Descriptions are not covered by IANZ accreditation. -Test performed on: Fraction passing 425µm -Sample history: Unknown -Plasticity Index method used: Liquid limit -Sample placed in mould at 19 Blows in liquid limit bowl

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

Date tested: 03-09/10/25

This report may only be reproduced in full

Approved Signatory

Date : 28/10/25

Thirushen Pillay
Senior Civil Engineering Technician



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

LAF108 (08/20)

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT



Project : Ground Investigations for Northland Corridor
Location : Alternative to Brynderwyn Hills section: A new route close to SH1
Client : NZTA C/- Aurecon & WSP NZ Ltd.
Contractor : -
Sampled by : NC Site Team
Date sampled : 27/09/25
Date received : 27/09/25
Sampling method : Digger
Sample condition : Natural; As received

Project No : 1-C2466.16
Lab Ref No : WL4709/19-LS
Client Ref No : -

Test Results	
Sample Lab Ref No :	WL4709/19-LS
Location ID :	TP2B_1125
Sample Depth (m) :	0.7-1.0
Soil Fraction Tested :	-425µm
Sample History :	Natural
Water Content as Rec'd (%) :	29.1
Water Content at LS test (%) :	56.2
Linear Shrinkage (%) :	15
Sample Description : WL4709/19-LS Refer to TP2B_1125 log report	
Test Methods	Notes
Water Content NZS 4402 : 1986, Test 2.1 Linear Shrinkage NZS 4402 : 1986, Test 2.6	Sample description is not IANZ endorsed.

Date tested : 06/11/25
Date reported : 07/11/25

Approved Signatory

Designation : *Laboratory Manager*
Date : 14/11/25

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