SUPPORTING DOCUMENTATION

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Contents:

1- Geotechnical Report
2- Allied Concrete SuperSlab Raft Floor
3- Structural Engineers PS1, Calculations & Inspection Schedule
4- Truss Layout & Truss Mftr's Producer Statement
5- H1 Calculations & Details

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 1

Geotechnical Report

TASMAN CONSULTING ENGINEERS
CIVIL & STRUCTURAL

File Ref: ***20308***

4th November 2021

Andrew Shepherd
105 Redvale Road
Redwood Valley
NELSON 7081

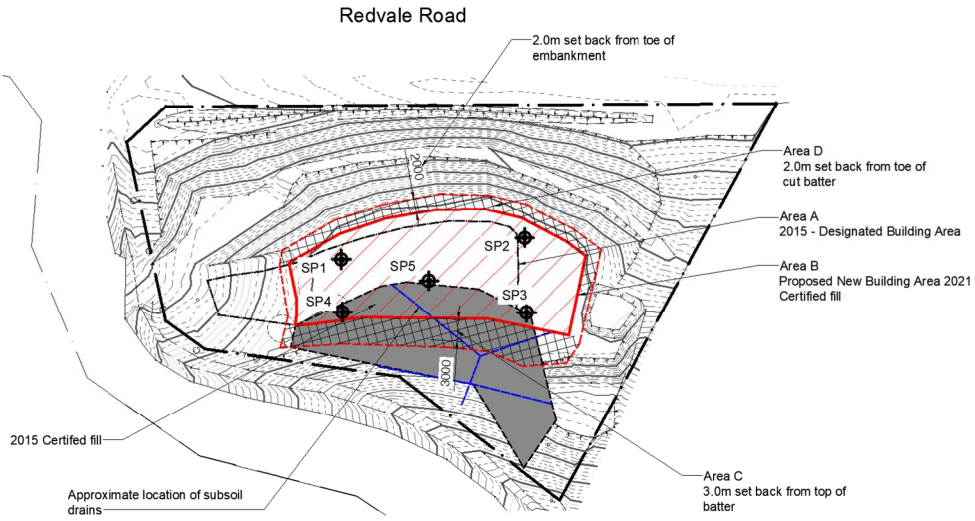
BUILDING LOCATION AREA ALTERATIONS – ANDREW SHEPHERD – 105 REDVALE ROAD, REDWOOD VALLEY

Tasman Consulting Engineers Limited (TCEL) was engaged by Andrew Shepherd to investigate and certify the raising of the existing Building Location Area at 105 Redwood Valley Rd, Redwood Valley. The legal description of the property is Lot 14 DP 476117.

Background

TCEL previously issued a Geotechnical Completion Report – Utopia Lifestyles - Galeo Estates for Lot 14 - Appleby Hills, Nelson, 11th March 2015. The 2015 building platform at RL 67.6m underwent alterations by the owner Mareen Black in 2016. The building platform was lowered approximately 0.7m to RL66.9m (approx.) and the upper slope was battered back and benched. Prior to carrying out the building works the property was on-sold to Andrew Shepherd in 2019.

The area designated A on Lot 14 in the attached site plan is the original Designated Building Area formed by cut and fill. The Geotechnical Completion Report prepared by Tasman Consulting Engineers on the 11th of March 2015 designated the BLA as a SID - *foundations would need to be specifically investigated and designed.* Refer to attached report Geotechnical Completion Report March 2015



Site Plan Showing areas referred to in report

PO Box 3631, Richmond
Nelson 7050, New Zealand

Phone +64 3 544 6404
Fax +64 3 544 6694
Email admin@tcel.co.nz

Ron O'Hara BE (Civil) MIPENZ

David King ME (Civil) MIPENZ CPEng IntPE



Fig 1. Site photo pre works 2020 – looking south-west (18/12/2020)

Scope of works

The scope of the works was to raise the overall level of the building platform by approximately 1.0m. Fill soil was to be sourced onsite from cut batters slopes on the western and northern batter slopes.

Tasman Consulting Engineers Limited (TCEL) was engaged to supervise and certify excavations and filling and confirm a new BLA. Tasman consulting Engineers undertook four inspections of the bulk earthworks on this site over the period 15th of March to the 26th of March 2021. The contractor was Gary Claire Contracting.

Stripping

Topsoil and organic material was stripped from batter slopes and building platform to a depth of approximately 100 mm and stockpiled exposing medium to light orange Silty gravelly CLAY.



Fig 2. Site photo – looking north (15/03/2021)

TCEL inspected and approved the stripped area, confirming the soil strength using Scala penetrometer.

Filling

Fill was site won gravely CLAY from the batter slopes to the west and north of the site.

Fill was laid in layers by a digger and was compacted in 100-200 mm lifts using a 2.5T self-powered vibrating drum roller. TCEL sighted and approved the filling throughout the works and at completion.

The finished platform was raised approximately 1.0m to RL 67.9m.

Batter slopes to the western and northern boundary lines were trimmed back to maintain slopes of 1v:2h and batter slopes on the eastern batter (fill) were maintained to 1v:2h.

Scala penetrometer testing by Tasman Consulting Engineers Ltd together with Nuclear Densometer Testing (NDM) testing by Civil Engineering Laboratory Services Ltd was undertaken at intervals during the filling and on the finished surface to check that:

- Fill density was consistent for each lift
- A minimum of 95% of MDD was achieved

Fill depth is approximately 1.0 m depth over the building platform.

Fill Certification of the new BLA area

During the work TCEL and CEL staff made periodic visits of inspection to the site as detailed above. On the basis of these inspections, it is my opinion that the bulk filling shown in Figure 3 below and the attached drawing 20308-S1 dated 01-11-2021 has been placed in accordance with NZS4431:1989 and complies with the bearing strength requirements of NZS3604:2011.

In my opinion the following limitations should be observed:

- No buildings are to be located within 3.0 m of the eastern boundary
- No buildings are to be located within 2.0 m of the northern and western batter toe

This certificate does not remove the necessity for the normal design and inspection of foundations as would be required in natural ground.



Fig 3. Site photo – looking south-east (24/11/2020)

Fill Testing

1. **Scala Penetrometer Testing**

New BLA area B – FGL

Summary of NZS 3604:2011 Bearing Strength Compliance

SP1	*SP2*	*SP3*	*SP4*	*SP5*
Pass >300kPa at 360mm -1140mm	**Pass** >300kPa at 480mm - 1150mm	**Pass** >300kPa at FGLmm - 1150mm	**Pass** >300kPa at FGLmm - 950mm	**Pass** >300kPa at FGLmm 1010mm

It is our opinion that this area is suitable to support foundations for a residential house

2. **Nuclear Densometer Testing (NDM) testing** - Refer to Appendix B

Specific Investigation and Design (SID) - Area C and D

The geotechnical completion report for Lot 14 by Tasman Consulting Engineers Ltd dated March 2015 made reference to cut and fill slopes on this site.

The recommendations from that report are incorporated into this certification.

The attached Schedule 2A certificate for lot 14 contains limitations related to building offsets from the base of cut and top of fill batters, and requirements for the design of future buildings and foundations. Refer to Attachments

The attached drawings "Designated Building Area Plan" show the designated areas to clarify the effect of the limitations. They have been drawn to show the innermost constraint of the following items:

- The established building platform
- The Land Title covenant restrictions covering building offsets from boundaries
- Offsets from banks or cut slopes as assessed by the 2015 report

Refer to Attachments, Tasman Consulting Engineer Ltd Geotechnical Completion Report 11th March 2015 and Galo Developments Subdivision Maisey Road.

General notes

Options for residential house foundations suitable for use on lot 14 include:-

- Low ground pressure **Rib Raft** floor slabs. Such slabs typically require 150 to 200 kPa ultimate soil bearing strength (cf. 300 kPa required for full NZS 3604:2011 compliance). Use of Rib Raft floors in conjunction with additional layers of compacted hardfill is considered suitable for use on this lot.

- Conventional ‘slab on ground’ construction will likely require an increase in the width and/or depth of the perimeter foundations to match the bearing strength of the foundation soil. For example a 400mm wide foundation will often reduce the ultimate bearing strength requirement for a brick veneer clad house to under 150 kPa.

- Drilled reinforced concrete or driven timber piles could also be used to support the foundations of conventional ‘slab on ground’ construction in areas identified as having low soil bearing strength. If the piles are located at approx. 1.5m centres it is not usually necessary to alter the perimeter foundation reinforcing from that required to comply with NZS 3604:2011.

Site Drainage

A swale drain has been formed along the bench above the building pad and the toe of the western batter to alleviate standing water prior to house construction with a permanent swale drain at the toe of the batter along the western to north-west edge of the platform.

Recommendation

It is our opinion not to be construed as a guarantee that the proposed Building Location Area Extensions as shown on the attached site plan, and designated areas A, B & C are suitable for construction of residential buildings provided that foundations are Specifically Investigated and Designed (SID) by a chartered professional engineer with experience in foundation design.

Limitations

This report is furnished to the Tasman District Council and Andrew Shepherd only. It is acknowledged that the council is entitled to provide information contained in this report pursuant to section 217 of the Building Act 2004 and section 44A of the Local Government Official Information and Meetings Act 1987.

Yours faithfully

Tasman Consulting Engineers Limited

Per:

	Reviewed:	Approved:
		
Mark Sommers NZCE (Civil), REA Senior Engineering Technician	Ron O’Hara BE (Civil), CMEngNZ Senior Engineer	David King ME (Civil), MIPENZ, CPEng Senior Engineer

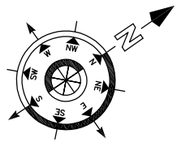
Attachments

Site plan and test locations

Certified fill results

Scala penetrometer logs

Geotechnical Completion report 2015



Redvale Road

LEGEND

Approximate location of subsoil drains (to show presence, not surveyed locations)

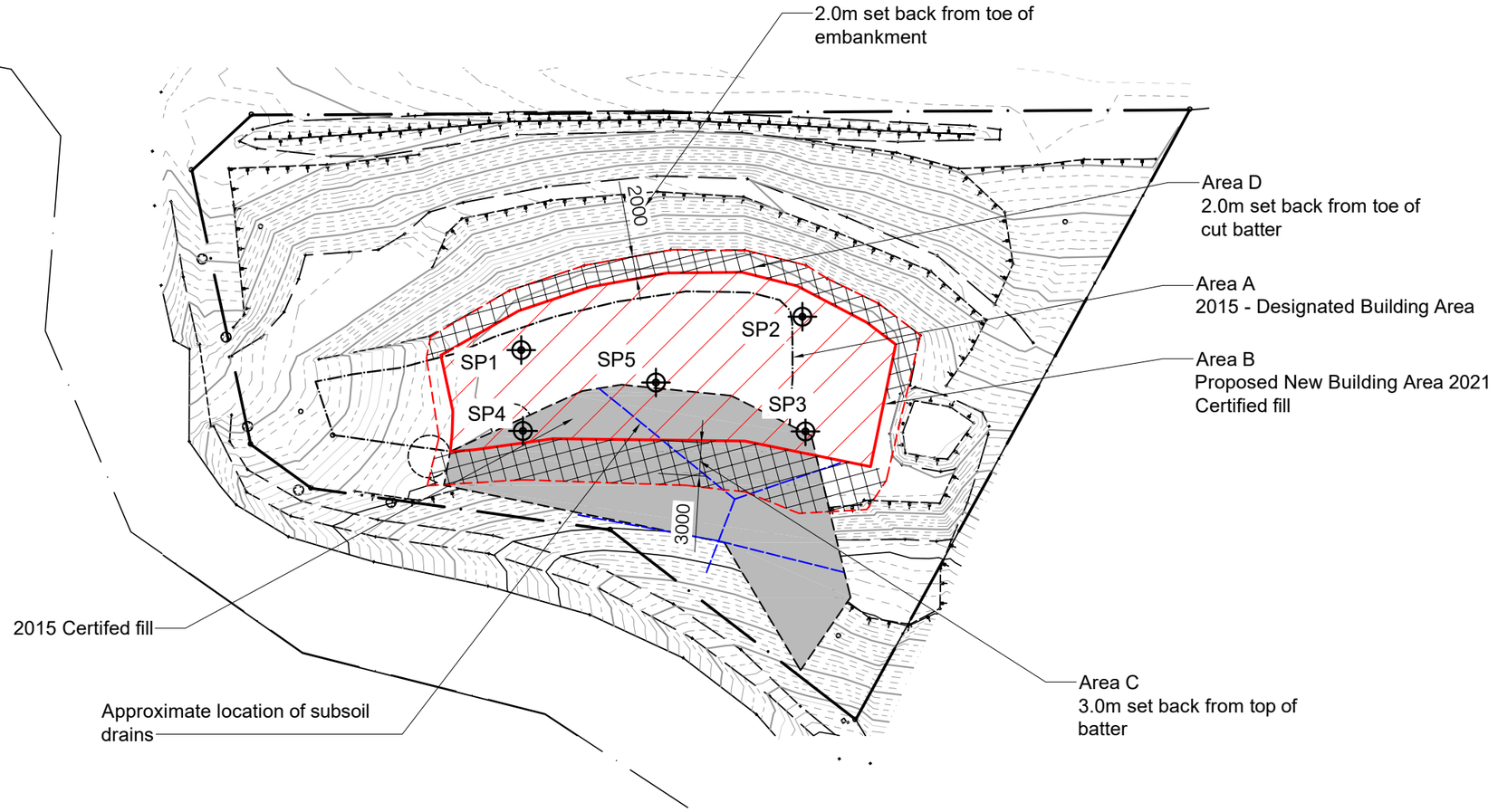
Certified fill 2015 - Complies with the requirements of NZS 4431:1989 BUT DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

Designated Building Area 2015. All building foundations to be located within this area.
Lots 14 DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

Certified fill 2021- Complies with the requirements of NZS 4431:1989

Designated Building Area 2021.
All building foundations to be located within this area.
Lot 14 Complies with the bearing strength requirements of NZS 3604:2011

Area of Specific Engineering Design.
Specific Investigation and Design by Chartered Professional Engineer (SED)



Legend

SP1 Scala Penetrometer Locations and ID

This drawing is copyright to Tasman Consulting Engineers Ltd

TASMAN CONSULTING ENGINEERS
195A Queen St
PO Box 3631
Richmond NELSON
Ph: (03) 544-6404
Fax: (03) 544-6694

ENGINEERING - SITE INVESTIGATION
ANDREW SHEPHERD
105 REDVALE ROAD, REDWOOD VALLEY

Scale 1:200 Original size A3	Sheet S1 of 1
Date 04-11-2021	
Drawn MWS	File 20308

Lab Ref No : **21/437**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Mob 027 4457071

NDM COMPACTION CONTROL TEST RESULTS

Project : **105 Redvale Road**
Location : **Redwood Valley**
Client : **Clare Contracting**
Contractor : **Clare Contracting**
Solid density (assumed) : **2.65 *t/m³**
Max dry density (tested) : **1.57 t/m³**
Optimum water content (tested) : **21 %**
MDD/OMC Lab Ref No : **14/819**

Tested by : **Andrew Hayward**
Date tested : **18/03/21**
Time tested : **8:30 AM**
Nuclear densometer no : **Troxler 3430+**
Copies to : **M Sommers**
Lab File

Nuclear Density Meter Test Results

Test Probe Depth (mm)		Direct Transmission									
Test #		Material	Test Area	Depth of Fill	Wet Density (t/m³)	NDM Water Content (%)	Dry Density (t/m³)	Oven Corrected Water Content (%)	Air Voids (%)	% of MDD	
1		Moutere Clay	House Pad	Approx 0.5m Below Finish Level	1.95	27.4	1.56	24.7	2.4	100	
2					1.95	25.3	1.59	22.8	3.7	101	
3					1.89	27.6	1.52	24.8	5.2	97	



Insitu Density : NZS 4407:2015, Test 4.2.1 or 4.2.2
Water Content : NZS 4402:1986, Test 2.1 for soils

Moisture correction factor used : 0.9
Sites selected by A Hayward Gravel/Clay
*** Not IANZ Endorsed**

Date reported : 19/03/21

This report may only be reproduced in full

Andrew Hayward
Designation : *Senior Laboratory Technician*
IANZ Approved Signatory
Date : 19/03/21

ACCREDITED IANZ TESTING LABORATORY 1021

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

Lab Ref No : **21/498**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Mob 027 4457071

NDM COMPACTION CONTROL TEST RESULTS

Project : **105 Redvale Road**
Location : **Redwood Valley**
Client : **Clare Contracting**
Contractor : **Clare Contracting**
Solid density (assumed) : **2.65 *t/m³**
Max dry density (tested) : **1.57 t/m³**
Optimum water content (tested) : **21 %**
MDD/OMC Lab Ref No : **14/819**

Tested by : **Andrew Hayward**
Date tested : **24/03/21**
Time tested : **4:00 PM**
Nuclear densometer no : **Troxler 3430+**
Copies to : **M Sommers**
Lab File

Nuclear Density Meter Test Results

Test Probe Depth (mm)		Direct Transmission									
Test #		Material	Test Area	Depth of Fill	Wet Density (t/m³)	NDM Water Content (%)	Dry Density (t/m³)	Oven Corrected Water Content (%)	Air Voids (%)	% of MDD	
1		Moutere Clay	House Pad	Finish Level	1.81	27.1	1.46	24.4	9.6	93	
2					1.80	27.6	1.44	24.8	10.0	92	
3					1.85	25.1	1.51	22.6	8.9	96	
4					1.84	26.4	1.49	23.8	8.5	95	
5					1.88	31.3	1.47	28.2	3.2	94	
6					1.84	23.3	1.52	21.0	10.6	97	



Insitu Density : NZS 4407:2015, Test 4.2.1 or 4.2.2
Water Content : NZS 4402:1986, Test 2.1 for soils

Moisture correction factor used : 0.9
Sites selected by A Hayward Gravel/Clay
*** Not IANZ Endorsed**

Date reported : 26/03/21

This report may only be reproduced in full

Andrew Hayward
Designation : *Senior Laboratory Technician*
IANZ Approved Signatory
Date : 26/03/21

ACCREDITED IANZ TESTING LABORATORY 1021

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

Lab Ref No : **21/507**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Mob 027 4457071

NDM COMPACTION CONTROL TEST RESULTS

Project : **105 Redvale Road**
Location : **Redwood Valley**
Client : **Clare Contracting**
Contractor : **Clare Contracting**
Solid density (assumed) : **2.65 *t/m³**
Max dry density (tested) : **1.57 t/m³**
Optimum water content (tested) : **21 %**
MDD/OMC Lab Ref No : **14/819**

Tested by : **Andrew Hayward**
Date tested : **26/03/21**
Time tested : **4:00 PM**
Nuclear densometer no : **Troxler 3430+**
Copies to : **M Sommers**
Lab File

Nuclear Density Meter Test Results

Test Probe Depth (mm)	Direct Transmission										
Test #	Retest No (21/498)	Material	Test Area	Depth of Fill	Wet Density (t/m³)	NDM Water Content (%)	Dry Density (t/m³)	Oven Corrected Water Content (%)	Air Voids (%)	% of MDD	
1	Site 1	Moutere Clay	House Pad	Finish Level	1.83	25.2	1.49	22.7	10.1	95	
2	Site 2				1.84	25.2	1.50	22.7	9.6	95	
3	Site 5				1.86	27.2	1.50	24.5	6.8	95	



Insitu Density : NZS 4407:2015, Test 4.2.1 or 4.2.2
Water Content : NZS 4402:1986, Test 2.1 for soils

Moisture correction factor used : 0.9
Sites selected by A Hayward Gravel/Clay
*** Not IANZ Endorsed**

Date reported : 29/03/21

This report may only be reproduced in full

Andrew Hayward
Designation : *Senior Laboratory Technician*
IANZ Approved Signatory
Date : 29/03/21

ACCREDITED IANZ TESTING LABORATORY 1021

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

SCALAR PENETROMETER TEST

Test Date: **26-03-21**

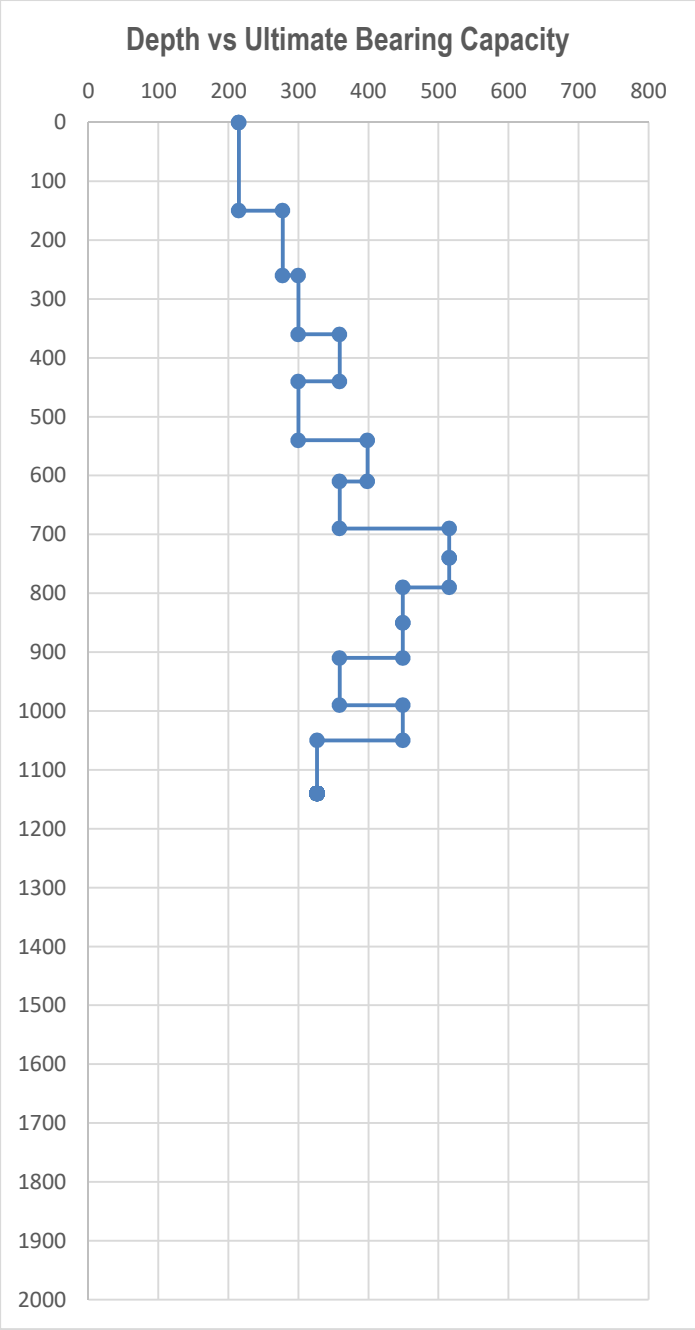
Client: **A Shepherd**

Address: **105 Redvale Road**
TCEL File: **20308**

NOTES
1. Test Method: NZS 4402.6.5.2:1988, Recorded in 5 blow increments
2. Ultimate bearing capacity derived from Stockwell (1977) and adjusted to match NZS 3604:2011

Lot Num: **Lot 14**
Test Ref: **SP1**

Depth	Blows	mm/Blow	Ultimate kPa
0	0		215
150	5	30	215
260	10	22	278
360	15	20	300
440	20	16	359
540	25	20	300
610	30	14	399
690	35	16	359
740	40	10	515
790	45	10	515
850	50	12	449
910	55	12	449
990	60	16	359
1050	65	12	449
1140	70	18	327



SCALAR PENETROMETER TEST

Test Date: **26-03-21**

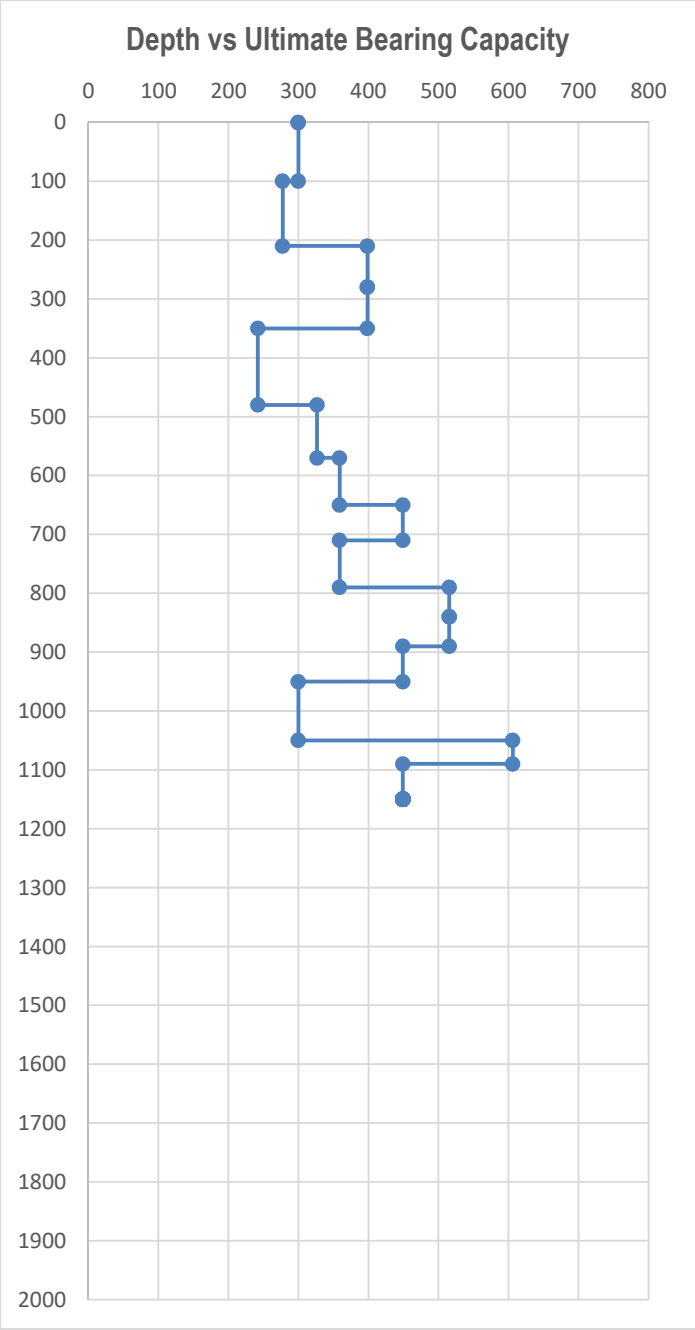
Client: **A Shepherd**

Address: **105 Redvale Road**
TCEL File: **20308**

NOTES
1. Test Method: NZS 4402.6.5.2:1988, Recorded in 5 blow increments
2. Ultimate bearing capacity derived from Stockwell (1977) and adjusted to match NZS 3604:2011

Lot Num: **Lot 14**
Test Ref: **SP2**

Depth	Blows	mm/Blow	Ultimate kPa
0	0		300
100	5	20	300
210	10	22	278
280	15	14	399
350	20	14	399
480	25	26	242
570	30	18	327
650	35	16	359
710	40	12	449
790	45	16	359
840	50	10	515
890	55	10	515
950	60	12	449
1050	65	20	300
1090	70	8	606
1150	75	12	449



SCALAR PENETROMETER TEST

Test Date: **26-03-21**

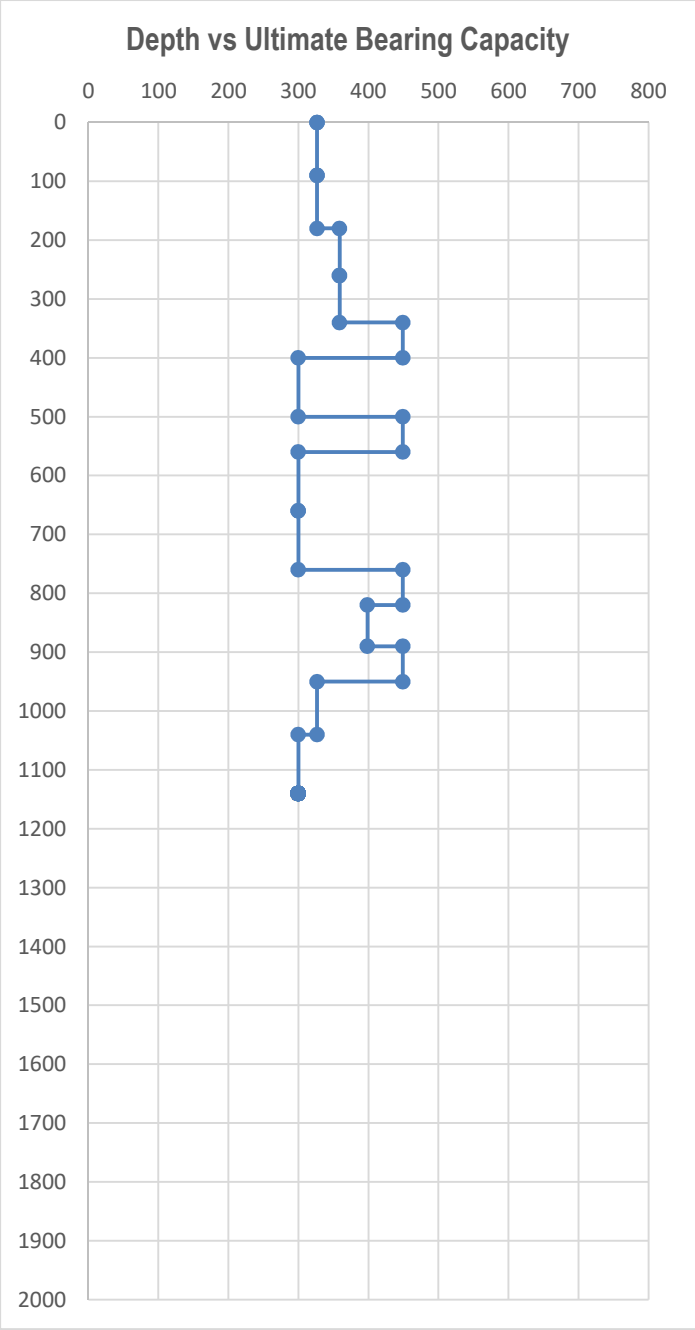
Client: **A Shepherd**

Address: **105 Redvale Road**
TCEL File: **20308**

NOTES
1. Test Method: NZS 4402.6.5.2:1988, Recorded in 5 blow increments
2. Ultimate bearing capacity derived from Stockwell (1977) and adjusted to match NZS 3604:2011

Lot Num: **Lot 14**
Test Ref: **SP3**

Depth	Blows	mm/Blow	Ultimate kPa
0	**0**		**327**
90	**5**	**18**	**327**
180	**10**	**18**	**327**
260	**15**	**16**	**359**
340	**20**	**16**	**359**
400	**25**	**12**	**449**
500	**30**	**20**	**300**
560	**35**	**12**	**449**
660	**40**	**20**	**300**
760	**45**	**20**	**300**
820	**50**	**12**	**449**
890	**55**	**14**	**399**
950	**60**	**12**	**449**
1040	**65**	**18**	**327**
1140	**70**	**20**	**300**



SCALAR PENETROMETER TEST

Test Date: **26-03-21**

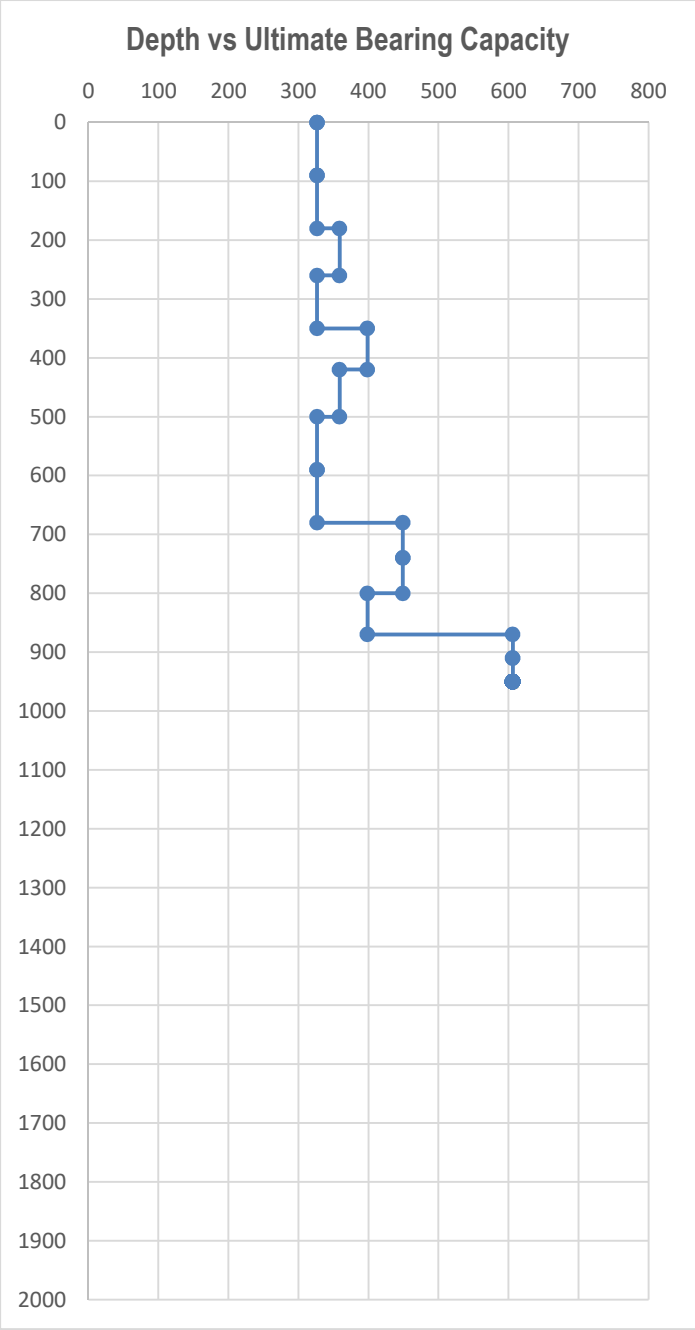
Client: **A Shepherd**

Address: **105 Redvale Road**
TCEL File: **20308**

NOTES
1. Test Method: NZS 4402.6.5.2:1988, Recorded in 5 blow increments
2. Ultimate bearing capacity derived from Stockwell (1977) and adjusted to match NZS 3604:2011

Lot Num: **Lot 14**
Test Ref: **SP4**

Depth	Blows	mm/Blow	Ultimate kPa
0	**0**		**327**
90	**5**	**18**	**327**
180	**10**	**18**	**327**
260	**15**	**16**	**359**
350	**20**	**18**	**327**
420	**25**	**14**	**399**
500	**30**	**16**	**359**
590	**35**	**18**	**327**
680	**40**	**18**	**327**
740	**45**	**12**	**449**
800	**50**	**12**	**449**
870	**55**	**14**	**399**
910	**60**	**8**	**606**
950	**65**	**8**	**606**



SCALAR PENETROMETER TEST

Test Date: **26-03-21**

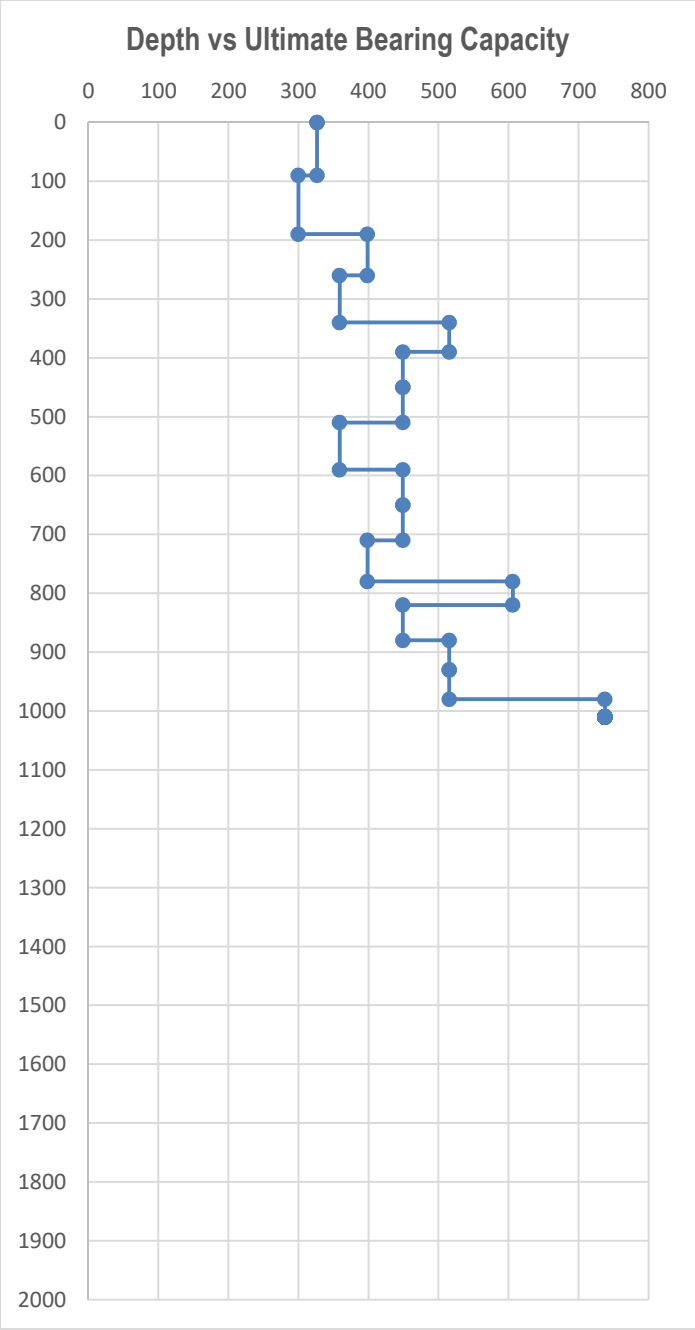
Client: **A Shepherd**

Address: **105 Redvale Road**
TCEL File: **20308**

NOTES
1. Test Method: NZS 4402.6.5.2:1988, Recorded in 5 blow increments
2. Ultimate bearing capacity derived from Stockwell (1977) and adjusted to match NZS 3604:2011

Lot Num: **Lot 14**
Test Ref: **SP5**

Depth	Blows	mm/Blow	Ultimate kPa
0	0		327
90	5	18	327
190	10	20	300
260	15	14	399
340	20	16	359
390	25	10	515
450	30	12	449
510	35	12	449
590	40	16	359
650	45	12	449
710	50	12	449
780	55	14	399
820	60	8	606
880	65	12	449
930	70	10	515
980	75	10	515
1010	80	6	738



TASMAN CONSULTING ENGINEERS
CIVIL & STRUCTURAL

File: 14118

11 March 2015

The Consents Officer
Tasman District Council
Private Bag
Richmond
NELSON 7050

Dear Sir,

GEOTECHNICAL COMPLETION REPORT – UTOPIA LIFESTYLES – GALEO ESTATE – LOTS 14, 16, 17, 18, 19 & 20 – APPLEBY HILLS, NELSON

Tasman Consulting Engineers Limited (TCEL) was engaged by Utopia Lifestyles to Ltd to supervise filling, investigate and certify the suitability for residential development of Lots 14, 16, 17, 18, 19 & 20 of the Galeo Estate subdivision located at Appleby Hills, Nelson. Investigation and monitoring for this certification report included:

- Fill Certification. Observe and carry out compliance testing during the placement and compaction of filling on Lots 14, 16, 17, 18, 19 & 20 and certify compliance with NZS 4431:1989
- Soil Bearing Strength. Six Scala penetrometer tests were taken in each proposed new Lot to a depth of 1.4 m. The scala testing was carried out to determine the suitability of underlying soils to support foundations of building designed in compliance with NZS 3604:2011.

Site Description

This stage of the subdivision is opposite 98 Redvale Road. It is accessed off a new Right-of-Way (ROW 'C') which descends down the eastern face of the ridge along which Redvale Road runs. The lots covered by this report are all accessed from this right of way. An unnamed stream runs near the south-eastern boundary of the site. The site slopes steeply to the east. The geology of the area is mapped as **Moutere Gravels**, described on the Nelson Geological Map as p*oorly to moderately well sorted clay bound gravel containing up to boulder sized clasts of quartzofeldspathic sandstone*.

Fill Certification – Lots 14, 16, 17, 18, 19 & 20

Lots 14, 16, 17, 18, 19 & 20 were shaped by cutting to fill sections of each site. The fill was sourced from in-situ soils and typically consisted of weathered Moutere Gravels.

Ron O'Hara BE (Civil)
David King ME (Civil) MIPENZ CPEng IntPE

PO Box 3631, Richmond
Nelson 7050, New Zealand

Phone +64 3 544 6404
Fax +64 3 544 6694
Email admin@tcel.co.nz

Prior to cutting and filling, the full area involved was stripped of all topsoil. Topsoil was stockpiled adjacent to the cut/fill area, and re-spread over each site following completion of the fill placement. TCEL observed and approved the completed stripping. A typical stripping operation is pictured below.

During stripping some uncertified fills and unsuitable clays were encountered. Every effort was made to locate and remove these materials prior to placing new filling. Where groundwater seepages were present or where fills extended across natural drainage courses, subsoil drains were placed to assist with ongoing drainage of the fills.

A layer of topsoil was re-spread over the front faces of completed fill batter slopes to aid stability and protect the fill from weather. Placement of topsoil on the building platforms had not been completed at the time of writing, except for Lots 14 and 16 where a thin layer of topsoil had been spread.



Stripping to Lot 14 – 5th November 2014

Placement and compaction of filling was reviewed using Nuclear Densometer testing to ensure that:

- The compacted fill had an average dry density of at least 95% of the Maximum Dry Density as measured in laboratory OWC testing. The testing was by Nuclear Densometer. Civil Engineering Laboratory Services carried out the tests. Results including OWC curves are attached.
- The compacted fill had an average air voids content of less than 10%.

Refer to Appendix C for copies of test results. The soil strength and consistency of fill compaction was checked during construction using Scala Penetrometer testing. The Scala testing indicated that the fill compaction was of a consistent standard with minor variation in soil strength throughout the depth of fill.

During the work, I and/or my staff made periodic visits of inspection to the site as detailed above. On the basis of these inspections, it is my opinion (not to be construed as a guarantee) that the earth fills forming building platforms has been placed in accordance with NZS4431:1989. In my opinion the following limitations should be observed:

- Setback from the top of fill banks as proposed in the Schedule 2A certifications attached (generally 5m, 3m in some cases based on slope and location of bank).
- Protection of subsoil drains for Lots 14, 17 & 20

This certificate, that the earth fills have been placed in compliance with the terms of NZS4431, does not remove the necessity for the normal inspection and design of foundations as would be made in natural ground.

Scala Penetrometer Testing

Six Scala Penetrometer tests were carried out on each lot to determine the range of Ultimate Bearing Strengths of the underlying soil. The location of scala testing is shown on the attached plan. The graphs of bearing strength vs depth for all tests are attached.

Compliance with the requirements of NZS 3604:2011 was determined from the test data. NZS 3604:2011 defines Good Ground as soil for which the Scala Penetrometer resistance is at least 5 blows per 100mm (equivalent to 300 kPa Ultimate Bearing Strength) at the underside of foundations and at least 3 blows per 100mm (equivalent to approximately 195 kPa Ultimate Bearing Strength) at depths greater than 2x the width of foundations below the underside of foundations.

The minimum foundation depth has been taken as being 300mm.

As the most common foundation width used on residential housing in this region is 300mm, the depth below the underside of foundations at which the 3 blows per 100mm was considered to apply was 600mm.

Any test for which the ultimate bearing strength was less than **300** kPa between depths of 100mm (to allow for the unconfined or thin topsoil top layer of soil) and 600mm (below existing ground level) OR less than **195** kPa at any depths greater than 600mm was considered non-complying.

Summary of NZS 3604:2011 Bearing Strength Compliance

Lot Number	14	16	17	18	19	20
SP1	**FAIL** 250kPa (250mm)	**FAIL** 140kPa (250mm)	**OK**	**OK**	**FAIL** 197kPa (550mm)	**OK**
SP2	**FAIL** 250kPa (250mm)	**OK**	**OK**	**OK**	**FAIL** 250kPa (300mm)	**FAIL** 197kPa (150mm)
SP3	**FAIL** 77kPa (150mm)	**OK**	**OK**	**FAIL** 250kPa (550mm)	**FAIL** 250kPa (150mm)	**FAIL** 197kPa (350mm)
SP4	**OK**	**FAIL** 250kPa (550mm)	**OK**	**OK**	**FAIL** 197kPa (450mm)	**FAIL** 197kPa (550mm)
SP5	**FAIL** 250kPa (550mm)	**OK**	**OK**	**OK**	**OK**	**FAIL** 197kPa (550mm)
SP6	**FAIL** 250kPa (150mm)	**OK**	**OK**	**FAIL** 250kPa (400mm)	**FAIL** 197kPa (350mm)	**FAIL** 250kPa (150mm)
3604 or SID	**SID**	**SID**	**3604**	**SID**	**SID**	**SID**

**3604:* Residential construction using the standard designs in NZS3604 is acceptable
SID: Foundations will need to be specifically investigated and designed.

Certification of Building Sites

It is my opinion, not to be construed as a guarantee, that the building platform on each of the lots (14, 16, 17, 18, 19 & 20) is suitable for the construction of a residential building designed in accordance with NZS3604:2011, subject to local authority planning regulations and any limitations noted on the attached Schedule 2A Certificates.

Scala penetrometer testing indicates that some of the soils forming building platforms on all lots do not fully comply with the requirements of NZS 3604:2011 for '*good ground'*.

A geotechnical assessment has been made of the cut slopes on each of the sites. The recommendations from that report are incorporated into this certification. The attached Schedule 2A certificate for each lot contains limitations related to building offsets from the base of cut and top of fill batters, and requirements for the design of future buildings and foundations.

The attached drawings "Designated Building Area and Filling Plan" show a designated building area. These areas have been drawn to clarify, for each lot, the effect of the limitations. They have been drawn to show the innermost constraint of the following items:

- The established building platform
- The Land Title covenant restrictions covering building offsets from boundaries
- Offsets from banks or cut slopes as assessed by this report

General Notes

Full compliance with the Scala penetrometer test requirements for foundation soils to fully comply with NZS 3604:2011 has been found difficult to achieve for many of the clay soils in the Nelson/Tasman region, and the testing carried out on the building platforms in the Galeo subdivision has indicated that areas of both the natural in-situ soil and certified fill does not fully meet the NZ 3604:2011 standard. The foundations for residential houses on some of these sites will require Specific Investigation and Design (SID) by a suitably qualified Chartered Professional Engineer.

Options for residential house foundations suitable for use on these lots include:-

- Low ground pressure **Rib Raft** floor slabs. Such slabs typically require 150 to 200 kPa ultimate soil bearing strength (cf. 300 kPa required for full NZS 3604:2011 compliance). Use of Rib Raft floors in conjunction with additional layers of compacted hardfill is considered suitable for use on all lots.
- Conventional 'slab on ground' construction will likely require an increase in the width and/or depth of the perimeter foundations to match the bearing strength of the foundation soil. For example a 400mm wide foundation will often reduce the ultimate bearing strength requirement for a brick veneer clad house to under 150 kPa.
- Drilled reinforced concrete or driven timber piles could also be used to support the foundations of conventional 'slab on ground' construction in areas identified as having low soil bearing strength. If the piles are located at approx. 1.5m centres it is not usually necessary to alter the perimeter foundation reinforcing from that required to comply with NZS 3604:2011.

Limitations

This certificate is furnished to the Tasman District Council alone. It is acknowledged that the council is entitled to provide information contained in this certificate pursuant to section 31 of the Building Act 1992 and section 44A of the Local Government Official Information and Meetings Act 1987.

This report is based on periodic monitoring and testing undertaken at a limited number of points within the site. Ground conditions may differ away from the investigation sites, both within and across lots. In particular it should be noted that this report is limited in scope to the areas of the site modified in order to establish building platforms.

Yours faithfully

Tasman Consulting Engineers Limited

Per:



David King
ME (Civil), CPEng, MIPENZ
Senior Engineer

Reviewed:



Ron O'Hara
BE (Civil), MIPENZ
Senior Engineer

Appendices

APPENDIX A. SCHEDULE 2A CERTIFICATION STATEMENT

APPENDIX B. SITE PLAN AND TEST LOCATIONS

APPENDIX C. CERTIFIED FILL TEST RESULTS

APPENDIX D. SCALA PENTROMETER LOGS

Appendix A. Schedule 2A certification statements

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 14**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **Filling complying with the requirements of NZS 4431:1989 has been placed on these lots. The location of fill is shown on the attached TCEL plan "Designated Building Area and Filling Plan" numbered 14118, Sheets 2 & 3.**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **Buildings shall only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **Buildings shally only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**
      (ii) **Subsoil drains are protected from damage, outlets kept clear and any damage repaired.**

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of

the Resource Management Act 1991 provided that:

(i) N/A – No restrictions

(f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

(i) **The foundations for residential houses and accessory buildings shall be Specifically Investigated and designed by a suitably qualified Chartered Professional Engineer experienced in foundation design.**

(ii) **Buildings shall be set back a minimum of 2m from the base of the cut batter or specific investigation and design of the works be undertaken by a Chartered Professional Engineer to retain or protect against slope failures.**

(ii) **The foundations for residential houses and accessory buildings shall be located at least 3m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 16**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **N/A – No filling**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **N/A – No filling**

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
      (i) N/A – No restrictions

   (f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

(i) **The foundations for residential houses and accessory buildings shall be Specifically Investigated and designed by a suitably qualified Chartered Professional Engineer experienced in foundation design.**

(ii) **The foundations for residential houses and accessory buildings shall be located at least 5m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 17**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and Report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **Filling complying with the requirements of NZS 4431:1989 has been placed on these lots. The location of fill is shown on the attached TCEL plan "Designated Building Area and Filling Plan" numbered 14118, Sheets 2 & 3.**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (ii) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**
      (ii) **Subsoil drains are protected from damage, outlets kept clear and any damage repaired.**

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
      (i) N/A – No restrictions

(f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

(i) **The foundations for residential houses and accessory buildings shall be located at least 5m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 18**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **Filling complying with the requirements of NZS 4431:1989 has been placed on these lots. The location of fill is shown on the attached TCEL plan "Designated Building Area and Filling Plan" numbered 14118, Sheets 2 & 3.**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
   (ii) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
   (i) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
   (i) N/A – No restrictions

(f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

(i) **The foundations for residential houses and accessory buildings shall be Specifically Investigated and designed by a suitably qualified Chartered Professional Engineer experienced in foundation design.**

(ii) **Buildings be set back a minimum of 2m from the base of the cut batter or specific investigation and design of the works be undertaken by a Chartered Professional Engineer to retain or protect against slope failures.**

(iii) **The foundations for residential houses and accessory buildings shall be located at least 5m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 19**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **Filling complying with the requirements of NZS 4431:1989 has been placed on these lots. The location of fill is shown on the attached TCEL plan "Designated Building Area and Filling Plan" numbered 14118, Sheets 2 & 3.**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:

      (iii) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

(d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:

(i) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

(e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:

(i) N/A – No restrictions

(f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

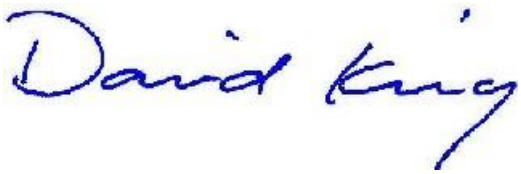
(i) **The foundations for residential houses and accessory buildings shall be Specifically Investigated and designed by a suitably qualified Chartered Professional Engineer experienced in foundation design.**

(ii) **The foundations for residential houses and accessory buildings shall be located at least 5m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development **LOT 20**

Developer **Galeo Estate**

Location **Appleby Hills, Nelson**

I **David King** of **Tasman Consulting Engineers Limited**

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. A preliminary investigation and report was not carried out for this subdivision. The extent of my inspections during construction and the results of all tests and/or re-evaluations carried out, are as described in my geotechnical completion report dated **11 March 2015.**

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   (a) **Filling complying with the requirements of NZS 4431:1989 has been placed on these lots. The location of fill is shown on the attached TCEL plan "Designated Building Area and Filling Plan" numbered 14118, Sheets 2 & 3.**

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (iv) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
      (i) **Buildings only be erected within the Designated Building Area and in accordance with the provisions of (f) below.**
      (ii) **Subsoil drains are protected from damage, outlets kept clear and any damage repaired.**

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
      (i) N/A – No restrictions

(f) **The area within the building platform is suitable for buildings complying with the requirements of NZS 3604:2011 (subject to TA planning requirements) providing that:**

(i) **The foundations for residential houses and accessory buildings shall be Specifically Investigated and designed by a suitably qualified Chartered Professional Engineer experienced in foundation design.**

(ii) **Buildings be set back a minimum of 2m from the base of the cut batter or specific investigation and design of the works be undertaken by a Chartered Professional Engineer to retain or protect against slope failures.**

(iii) **The foundations for residential houses and accessory buildings shall be located at least 5m back from the top of the fill slope.**

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed Date **11 March 2015**



ME(Civil)
MIPENZ (Civil, Structural)
CPEng IntPE - no. 145511

Appendix B. Site Plan and Test Locations

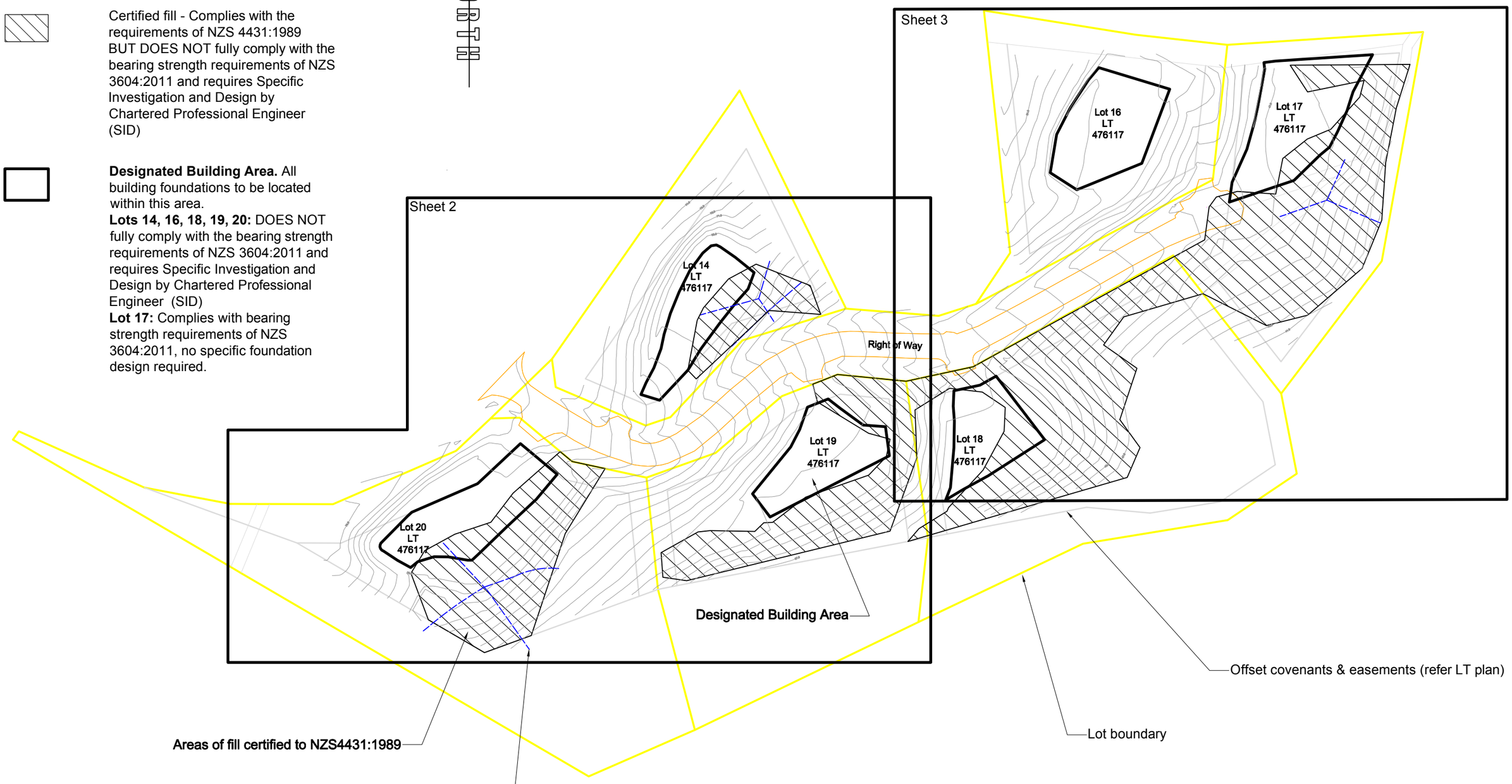
LEGEND

Approximate location of subsoil drains (to show presence, not surveyed locations)

Certified fill - Complies with the requirements of NZS 4431:1989 BUT DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

Designated Building Area. All building foundations to be located within this area.
Lots 14, 16, 18, 19, 20: DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)
Lot 17: Complies with bearing strength requirements of NZS 3604:2011, no specific foundation design required.

NORTH



Overall Site Layout

Sheet 4: Scala Penetrometer Test Locations

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TASMAN CONSULTING ENGINEERS
195A Queen St
PO Box 3631
Richmond NELSON
t: (03) 544-6404
w: www.tcel.co.nz

Utopia Lifestyles
Galeo Estate Subdivision, Redvale Road
Lots 14 to 20

Scale	1:1000 @ A3
Date	11-03-2015
Drawn	RGX
Sheet	1 of 4
File	14118

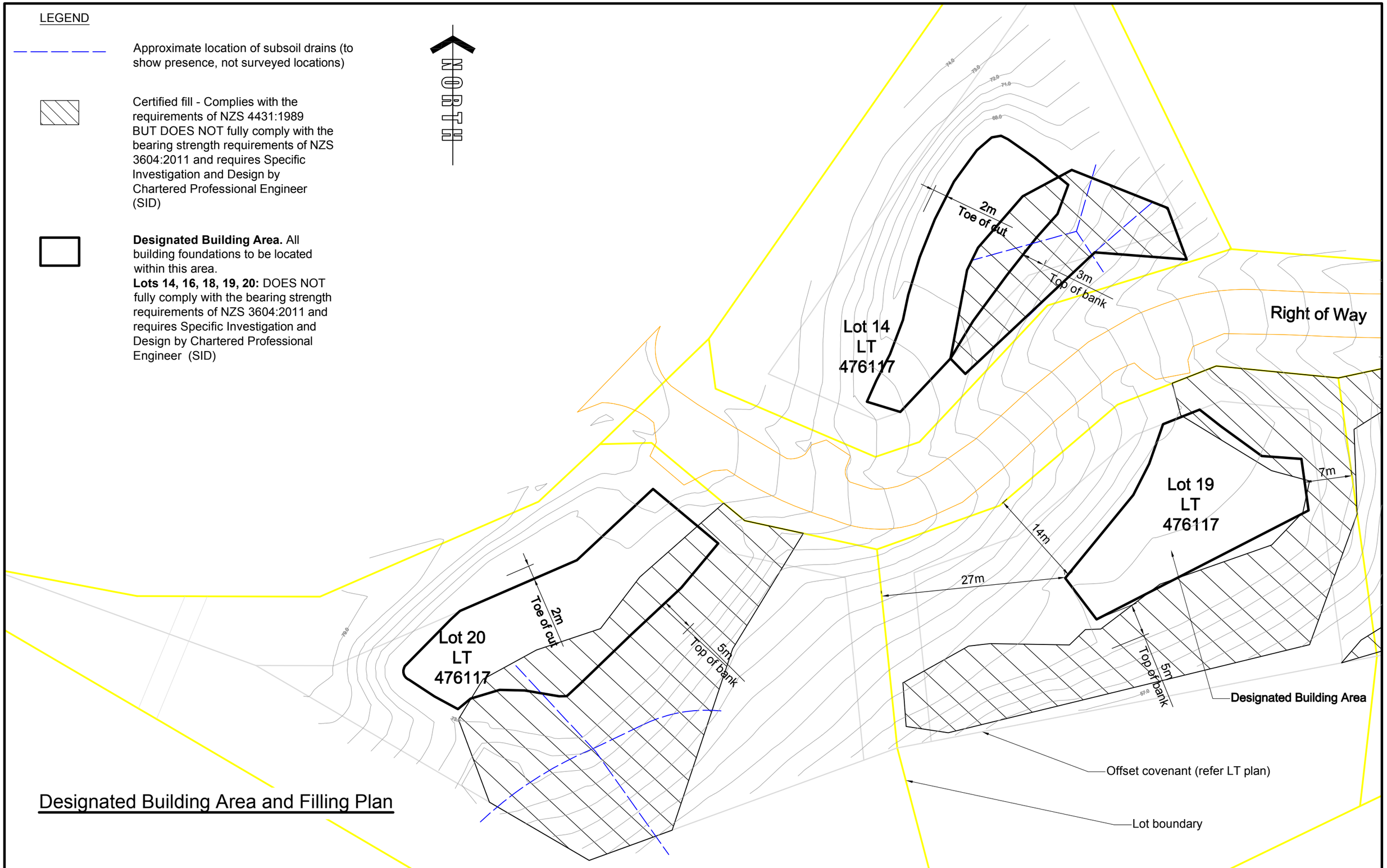
LEGEND

Approximate location of subsoil drains (to show presence, not surveyed locations)

Certified fill - Complies with the requirements of NZS 4431:1989 BUT DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

Designated Building Area. All building foundations to be located within this area.
Lots 14, 16, 18, 19, 20: DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

NORTH



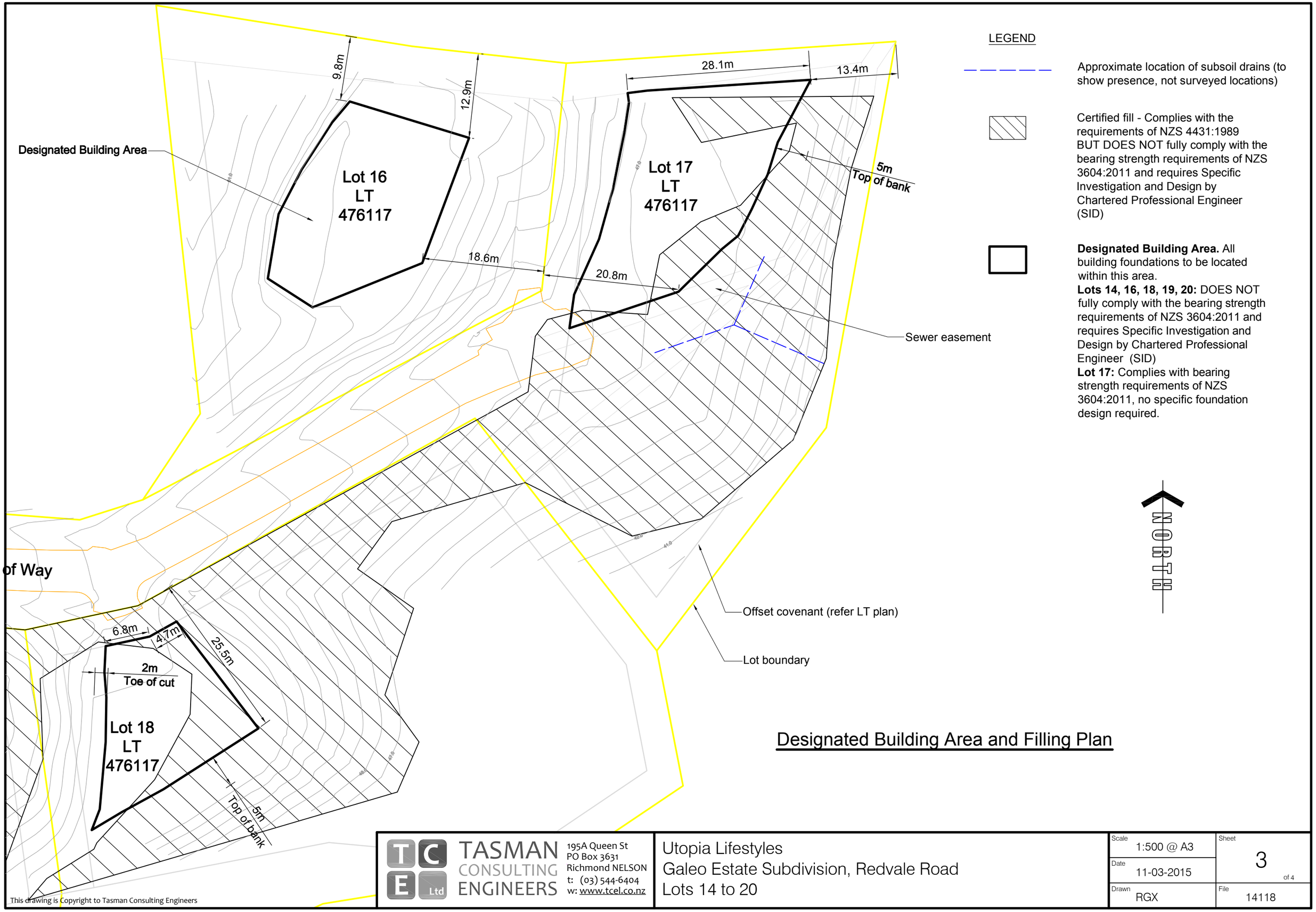
Designated Building Area and Filling Plan

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TASMAN CONSULTING ENGINEERS
195A Queen St
PO Box 3631
Richmond NELSON
t: (03) 544-6404
w: www.tcel.co.nz

Utopia Lifestyles
Galeo Estate Subdivision, Redvale Road
Lots 14 to 20

Scale 1:500 @ A3	Sheet 2 of 4
Date 11-03-2015	
Drawn RGX	File 14118



LEGEND

Approximate location of subsoil drains (to show presence, not surveyed locations)

Certified fill - Complies with the requirements of NZS 4431:1989 BUT DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)

Designated Building Area. All building foundations to be located within this area.
Lots 14, 16, 18, 19, 20: DOES NOT fully comply with the bearing strength requirements of NZS 3604:2011 and requires Specific Investigation and Design by Chartered Professional Engineer (SID)
Lot 17: Complies with bearing strength requirements of NZS 3604:2011, no specific foundation design required.

Designated Building Area and Filling Plan

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TASMAN CONSULTING ENGINEERS
195A Queen St
PO Box 3631
Richmond NELSON
t: (03) 544-6404
w: www.tcel.co.nz

Utopia Lifestyles
Galeo Estate Subdivision, Redvale Road
Lots 14 to 20

Scale 1:500 @ A3	Sheet 3 of 4
Date 11-03-2015	
Drawn RGX	File 14118

LEGEND

SP1 — Approximate location of Scala Penetrometer test

Filling

NORTH

Lot 14 LT 476117

Lot 16 LT 476117

Lot 17 LT 476117

Lot 18 LT 476117

Lot 19 LT 476117

Lot 20 LT 476117

Right of Way

Scala Penetrometer Test Locations

TASMAN CONSULTING ENGINEERS
195A Queen St
PO Box 3631
Richmond NELSON
t: (03) 544-6404
w: www.tcel.co.nz

Utopia Lifestyles
Galeo Estate Subdivision, Redvale Road
Lots 14 to 20

Scale	Sheet
1:750 @ A3	4 of 4
Date: 11-03-2015	
Drawn: RGX	File: 14118

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Appendix C. Certified fill test results

Lab Ref No : **14/819**
Client Ref No : **-**
Project No : **-**

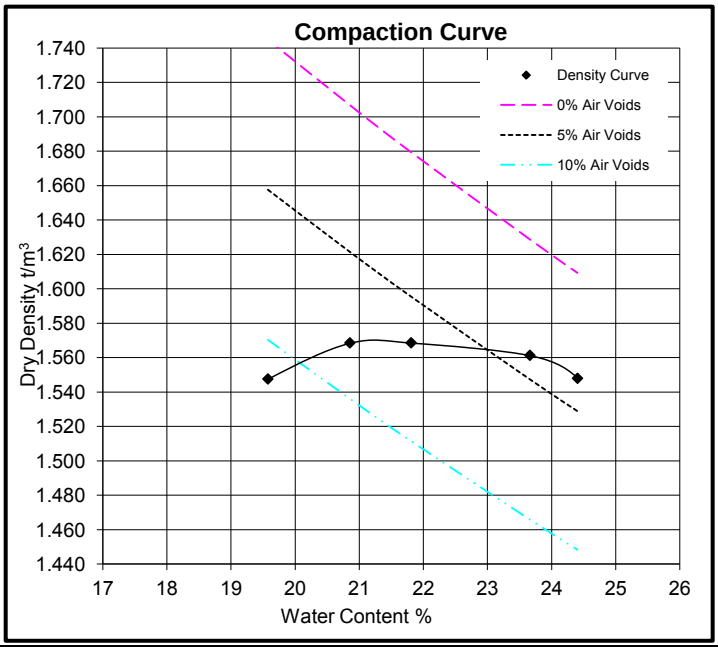
Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson Unit 3/30 Echodale Place Stoke
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

OPTIMUM MOISTURE CONTENT/ MAXIMUM DRY DENSITY RELATIONSHIP
NZ STANDARD COMPACTION TEST REPORT

Project :	**Galeo, Stage 1B**	Date sampled :	**07/10/14**
Location :	**Maisey Road**	Date received :	**07/10/14**
Source :	**Test Pit - Lot 18**	Date tested :	**08/10/14**
Client :	**Utopia Lifestyle**	Sample description :	**Moutere Gravel**
Contractor :	**Tasman Consulting Engineers Ltd**	Sample condition :	**Damp**
Sampled by :	**R O'Hara**	Sampling method :	**Unknown**

Test Results

Sample ID		1	2	3	4	5		
Bulk density	t/m³	1.851	1.896	1.911	1.931	1.926		
Water content	%	19.6	20.9	21.8	23.7	24.4		
Dry density	t/m³	1.548	1.569	1.569	1.561	1.548		



Maximum dry density	**1.57**	**t/m³**
Optimum water content	**21**	**%**
Natural water content	**27.1**	**%**
Fraction tested	**< 19 mm**	
% Retained on 19mm sieve	**0**	**%**
Solid density t/m³	**2.65**	**(Assumed)**

Test Methods	**Notes**
Compaction	NZS : 4402 : 1986 : Test 4.1.1 (Standard)
Water Content	NZS : 4402 : 1986 : Test 2.1

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Sampling is not covered by IANZ endorsement

Date reported : 9-Oct-14

Approved Signatory
Reported by : *Robbie Burns*
Designation: Assistant Laboratory Manager
IANZ Approved Signatory

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/968**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 14**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **12/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number			1	2		
Chainage (m)			See Photo Below			
Lift			First Lift of 0.5m			
Test Probe Depth (mm)			Direct Transmission			
Wet Density (t/m³)			1.93	1.91		
Oven Corrected Test Results						
Dry Density (t/m³)			1.51	1.54		
Water Content (%)			28.3	23.9		
Air Voids (%)			0.6	5.0		
% of MDD			96	98		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 12/11/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 12/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/980**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 14**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **14/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number			1	2		
Chainage (m)			See Photo Below			
Lift			2nd Lift of 0.8m	2nd Lift of 0.4m		
Test Probe Depth (mm)			Direct Transmission			
Wet Density (t/m³)			1.97	1.95		
Oven Corrected Test Results						
Dry Density (t/m³)			1.63	1.60		
Water Content (%)			21.0	22.1		
Air Voids (%)			4.6	4.4		
% of MDD			104	102		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 14/11/14

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Robbie Burns
Designation : *Assistant Laboratory Manager*
IANZ Approved Signatory
Date : 14/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/1011**
Client Ref No : **-**
Order No : **-**

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INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 20 First Lift Retest, Lot 14 Finish Level**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **25/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number	1	2	3	4	5	6
Chainage (m)	See Photo Below					
Lift	First Lift of approx 1.0m			Finish Level		
Test Probe Depth (mm)	Direct Transmission					
Lot Number	Lot 20			Lot 14		
Wet Density (t/m³)	1.96	1.92	1.92	1.96	1.90	2.01
Oven Corrected Test Results						
Dry Density (t/m³)	1.59	1.60	1.58	1.59	1.52	1.69
Water Content (%)	23.5	19.7	21.3	23.2	25.2	18.9
Air Voids (%)	2.8	8.0	6.4	3.2	4.4	4.4
% of MDD	101	102	101	101	97	107





Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 25/11/14

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Andrew Hayward
Designation : *Laboratory Technician*
IANZ Approved Signatory
Date : 25/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/938**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 17, Lot 16 Retest**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **4/11/2014 @ 4:30pm**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number	1	2	3	4	5	6
Chainage (m)	See Photo Below					
Lift	Approx Finish Level					
Test Probe Depth (mm)	Direct Transmission					
Lot Number	Lot 17			Lot 16		
Wet Density (t/m³)	1.98	2.02	1.95	1.83	1.80	1.87
Oven Corrected Test Results						
Dry Density (t/m³)	1.70	1.75	1.66	1.42	1.43	1.46
Water Content (%)	15.9	15.1	17.3	29.2	25.7	27.9
Air Voids (%)	8.5	7.3	8.4	5.1	8.9	4.0
% of MDD	109	112	106	90	91	93





Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 05/11/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 05/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/933**
Client Ref No : **-**
Order No : **-**

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Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 16**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **04/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		Approx Finish Level				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.79	1.85	1.85		
Oven Corrected Test Results						
Dry Density (t/m³)		1.40	1.45	1.46		
Water Content (%)		28.1	27.5	26.4		
Air Voids (%)		8.0	5.6	6.3		
% of MDD		89	92	93		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 04/11/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 04/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/931 Reissue #1**
Client Ref No : -
Order No : -

Civil Engineering Laboratory Services Ltd
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Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 17**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **03/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		1st Lift of 1.0m				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.97	2.02	1.97		
Oven Corrected Test Results						
Dry Density (t/m³)		1.64	1.71	1.62		
Water Content (%)		19.9	18.1	21.8		
Air Voids (%)		5.5	4.6	3.7		
% of MDD		104	109	103		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 04/11/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 04/11/14

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Lab Ref No : **14/931**
Client Ref No : **-**
Order No : **-**

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Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 17**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **03/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		Approx Finish Level				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.97	2.02	1.97		
Oven Corrected Test Results						
Dry Density (t/m³)		1.64	1.71	1.62		
Water Content (%)		19.9	18.1	21.8		
Air Voids (%)		5.5	4.6	3.7		
% of MDD		104	109	103		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 04/11/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 04/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/828**
Client Ref No : **-**
Order No : **-**

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INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **09/10/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)	See Photo Below					
Lift	2nd Lift of Approx 1.5m					
Test Probe Depth (mm)	Direct Transmission					
Wet Density (t/m³)		1.90	1.90	1.98		
Oven Corrected Test Results						
Dry Density (t/m³)		1.54	1.49	1.64		
Water Content (%)		23.1	27.4	21.1		
Air Voids (%)		6.0	2.7	3.8		
% of MDD		98	95	104		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4407:1991, Test 3.1 for aggregates	**Sites selected by contractor**
Water Content : NZS 4402:1986, Test 2.1 for soils	
	*** Not IANZ Endorsed**

Date reported : 09/10/14

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Robbie Burns
Designation : *Assistant Laboratory Manager*
IANZ Approved Signatory
Date : 09/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/862**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **16/10/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		Retest of 3rd Lift of Approx 1.5m				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.82	1.93	1.95		
Oven Corrected Test Results						
Dry Density (t/m³)		1.48	1.57	1.53		
Water Content (%)		23.4	22.9	26.9		
Air Voids (%)		9.8	4.6	0.9		
% of MDD		94	100	98		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4407:1991, Test 3.1 for aggregates	**Sites selected by contractor**
Water Content : NZS 4402:1986, Test 2.1 for soils	
	*** Not IANZ Endorsed**

Date reported : 16/10/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 16/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/871**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **17/10/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		2nd Retest of 3rd Lift of Approx 1.5m	4th Lift of 500mm			
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.91	1.96	1.92		
Oven Corrected Test Results						
Dry Density (t/m³)		1.53	1.62	1.57		
Water Content (%)		24.4	21.5	22.4		
Air Voids (%)		4.8	4.3	5.8		
% of MDD		98	103	100		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 17/10/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 17/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/893**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **22/10/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3	4	
Chainage (m)		See Photo Below				
Lift		5th Lift of Approx 1.5m				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.99	2.04	2.00	2.01	
Oven Corrected Test Results						
Dry Density (t/m³)		1.65	1.71	1.68	1.65	
Water Content (%)		20.7	18.9	19.4	22.1	
Air Voids (%)		3.7	3.0	4.2	1.5	
% of MDD		105	109	107	105	



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 22/10/14

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Mick Zeewoldt
Designation : *Laboratory Manager*
IANZ Approved Signatory
Date : 22/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/900**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **23/10/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3	4	
Chainage (m)		See Photo Below				
Lift		Approx Finish Level				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		2.00	2.02	2.03	2.01	
Oven Corrected Test Results						
Dry Density (t/m³)		1.60	1.70	1.62	1.65	
Water Content (%)		25.1	18.9	25.1	21.6	
Air Voids (%)		0.0	3.9	0.0	2.1	
% of MDD		102	108	103	105	



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 23/10/14

This report may only be reproduced in full

Robbie Burns
Designation : *Assistant Laboratory Manager*
IANZ Approved Signatory
Date : 23/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/824**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1B**
Location : **Lot 18**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **08/10/14**
Nuclear densometer no : **Troxler 3430**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number			1	2		
Chainage (m)	See Photo Below					
Lift	First Lift of Approx 1.5m					
Test Probe Depth (mm)	Direct Transmission					
Wet Density (t/m³)			1.93	1.91		
Oven Corrected Test Results						
Dry Density (t/m³)			1.59	1.57		
Water Content (%)			21.4	21.7		
Air Voids (%)			6.2	6.6		
% of MDD			101	100		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4407:1991, Test 3.1 for aggregates	**Sites selected by contractor**
Water Content : NZS 4402:1986, Test 2.1 for soils	
	*** Not IANZ Endorsed**

Date reported : 09/10/14

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Robbie Burns
Designation : *Assistant Laboratory Manager*
IANZ Approved Signatory
Date : 09/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/909**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 19**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **24/10/14**
Nuclear densometer no : **Troxler 3430**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number		1	2	3		
Chainage (m)		See Photo Below				
Lift		Approx Finish Level				
Test Probe Depth (mm)		Direct Transmission				
Wet Density (t/m³)		1.92	1.94	1.98		
Oven Corrected Test Results						
Dry Density (t/m³)		1.55	1.57	1.67		
Water Content (%)		24.1	23.8	19.0		
Air Voids (%)		4.1	3.6	5.5		
% of MDD		99	100	106		



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 24/10/14

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Robbie Burns
Designation : *Assistant Laboratory Manager*
IANZ Approved Signatory
Date : 24/10/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/1031**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 20**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **27/11/2014 @ 4:45pm**
Nuclear densometer no : **Troxler 3430**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results					
Test Number	1	2	3	4	
Chainage (m)	See Photo Below				
Lift	3rd lift of approx 1.5m				
Test Probe Depth (mm)	Direct Transmission				
Wet Density (t/m³)	1.93	1.98	2.02	2.05	
Oven Corrected Test Results					
Dry Density (t/m³)	1.55	1.67	1.73	1.78	
Water Content (%)	24.8	18.6	17.2	15.5	
Air Voids (%)	3.1	5.8	5.2	5.4	
% of MDD	99	106	110	113	



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 28/11/14

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Andrew Hayward
Designation : *Laboratory Technician*
IANZ Approved Signatory
Date : 28/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/1036**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 20**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **01/12/14**
Nuclear densometer no : **Troxler 3430**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results					
Test Number	1	2	3	4	
Chainage (m)	See Photo Below				
Lift	Finish Level				
Test Probe Depth (mm)	Direct Transmission				
Wet Density (t/m³)	1.94	2.05	1.98	1.98	
Oven Corrected Test Results					
Dry Density (t/m³)	1.62	1.71	1.65	1.61	
Water Content (%)	20.0	20.0	20.3	22.8	
Air Voids (%)	6.5	1.5	4.3	2.7	
% of MDD	103	109	105	102	



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 01/12/14

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Andrew Hayward
Designation : *Laboratory Technician*
IANZ Approved Signatory
Date : 01/12/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/1011**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 20 First Lift Retest, Lot 14 Finish Level**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **25/11/14**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results						
Test Number	1	2	3	4	5	6
Chainage (m)	See Photo Below					
Lift	First Lift of approx 1.0m			Finish Level		
Test Probe Depth (mm)	Direct Transmission					
Lot Number	Lot 20			Lot 14		
Wet Density (t/m³)	1.96	1.92	1.92	1.96	1.90	2.01
Oven Corrected Test Results						
Dry Density (t/m³)	1.59	1.60	1.58	1.59	1.52	1.69
Water Content (%)	23.5	19.7	21.3	23.2	25.2	18.9
Air Voids (%)	2.8	8.0	6.4	3.2	4.4	4.4
% of MDD	101	102	101	101	97	107





Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 25/11/14

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Andrew Hayward
Designation : *Laboratory Technician*
IANZ Approved Signatory
Date : 25/11/14

IANZ ACCREDITED LABORATORY 1021

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

Lab Ref No : **14/1027**
Client Ref No : **-**
Order No : **-**

Civil Engineering Laboratory Services Ltd
PO Box 1424, Nelson
Ph 03 547 0110 Fax 03 547 0120 Mob 027 4457071

INSITU DENSITY COMPACTION CONTROL TEST RESULTS

Project : **Galeo, Stage 1b**
Location : **Lot 20**
Client : **Utopia Lifestyle**
Contractor : **Tasman Consulting Engineers Ltd**
Solid density (assumed) : **2.65** ***t/m³**
Max dry density (tested) : **1.57** **t/m³**
Optimum water content (tested) : **21** **%**
MDD/OMC Lab Ref No: **14/819**

Tested by : **A Hayward**
Date tested : **27/11/2014 @ 730am**
Nuclear densometer no : **Troxler 3440**

Copies to: **R O'Hara**
Lab File

Nuclear Densometer Test Results					
Test Number	1	2	3	4	
Chainage (m)	See Photo Below				
Lift	2nd lift of approx 1.5m				
Test Probe Depth (mm)	Direct Transmission				
Wet Density (t/m³)	1.89	2.00	1.96	1.98	
Oven Corrected Test Results					
Dry Density (t/m³)	1.56	1.65	1.57	1.67	
Water Content (%)	21.4	21.1	24.4	18.4	
Air Voids (%)	7.7	2.7	2.2	6.2	
% of MDD	99	105	100	107	



Test Method	Notes
Insitu Density : NZS 4407:1991, Test 4.2.1 or 4.2.2	**Moisture correction factor used :** 0.9
Water Content : NZS 4402:1986, Test 2.1 for soils	**Sites selected by contractor**
	*** Not IANZ Endorsed**

Date reported : 27/11/14

This report may only be reproduced in full

Andrew Hayward
Designation : *Laboratory Technician*
IANZ Approved Signatory
Date : 27/11/14

IANZ ACCREDITED LABORATORY 1021

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

Appendix D. Scala Pentrometer Logs

SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	4	25	250
100-200	5	20	300
200-300	4	25	250
300-400	6	17	347
400-500	5	20	300
500-600	3	33	197
600-700	3	33	197
700-800	4	25	250
800-900	6	17	347
900-1000	6	17	347
1000-1100	7	14	392
1100-1200	6	17	347
1200-1300	5	20	300
1300-1400	5	20	300
1400-1500			

Test Date: **05-12-14**

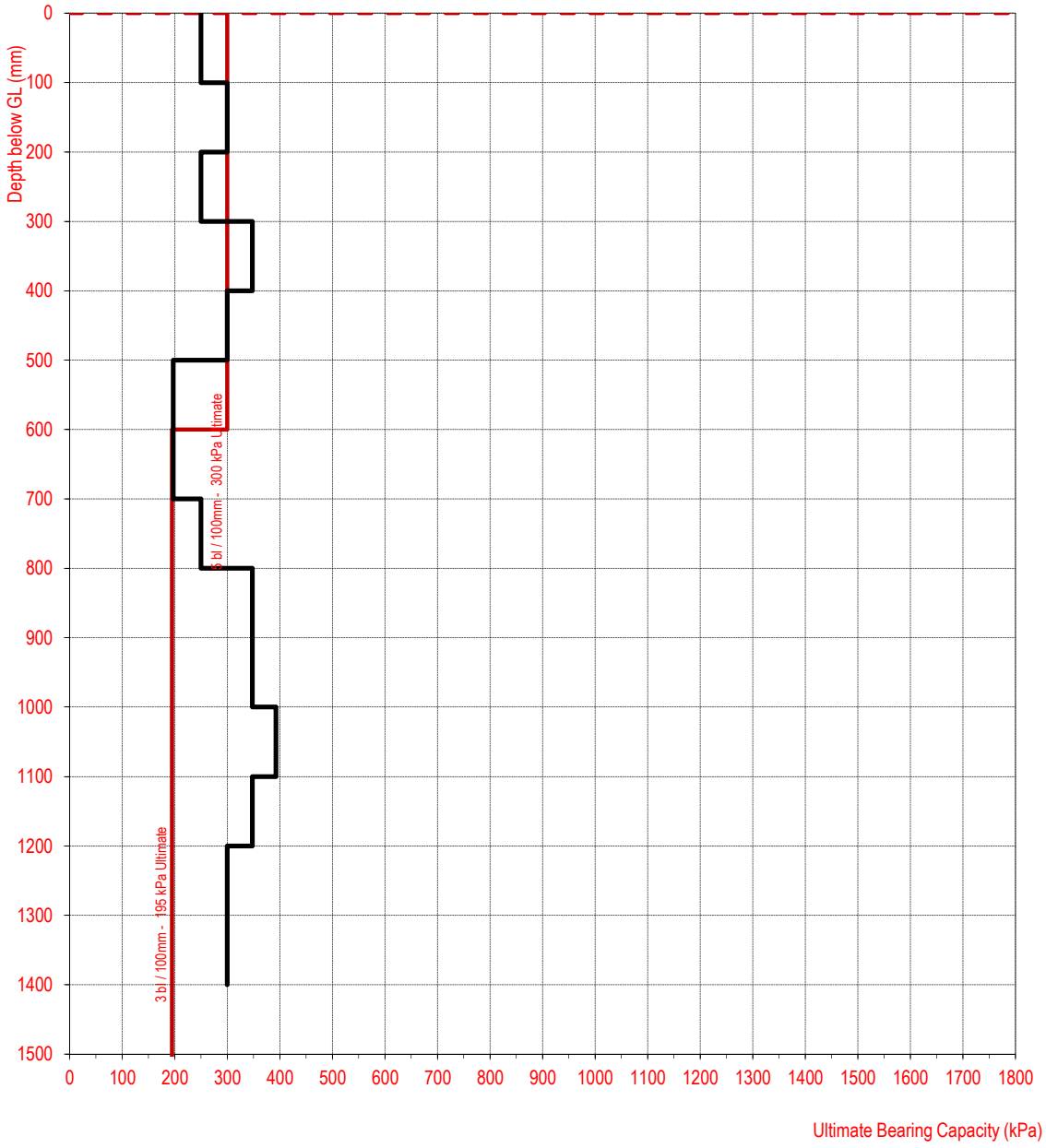
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	5	20	300
200-300	4	25	250
300-400	9	11	476
400-500	9	11	476
500-600	4	25	250
600-700	4	25	250
700-800	5	20	300
800-900	4	25	250
900-1000	3	33	197
1000-1100	5	20	300
1100-1200	8	13	435
1200-1300	6	17	347
1300-1400	16	6	718
1400-1500			

Test Date: **05-12-14**

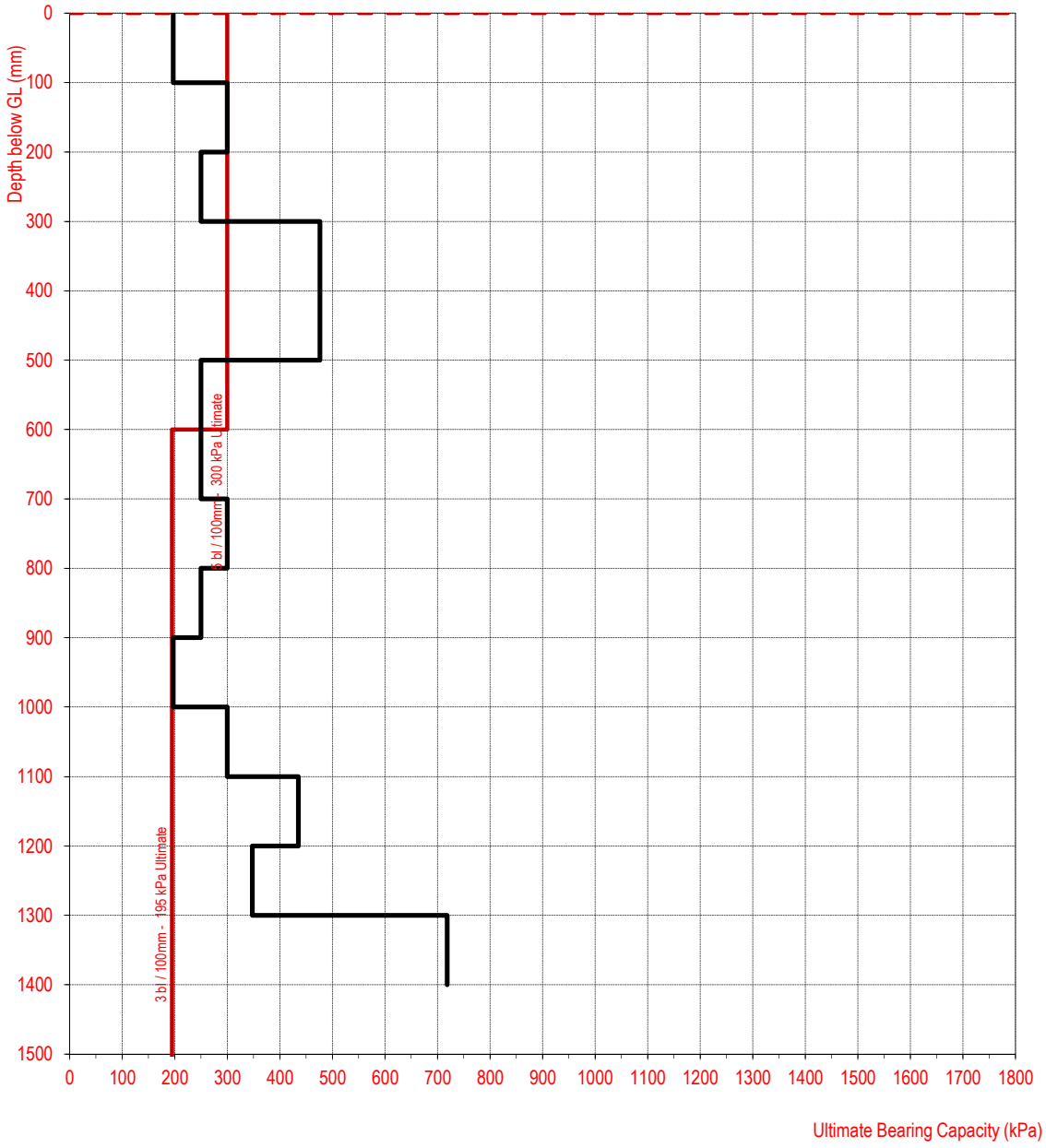
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	1	100	77
100-200	1	100	77
200-300	5	20	300
300-400	6	17	347
400-500	4	25	250
500-600	3	33	197
600-700	5	20	300
700-800	6	17	347
800-900	8	13	435
900-1000	8	13	435
1000-1100	7	14	392
1100-1200	9	11	476
1200-1300	14	7	656
1300-1400	10	10	516
1400-1500			

Test Date: **05-12-14**

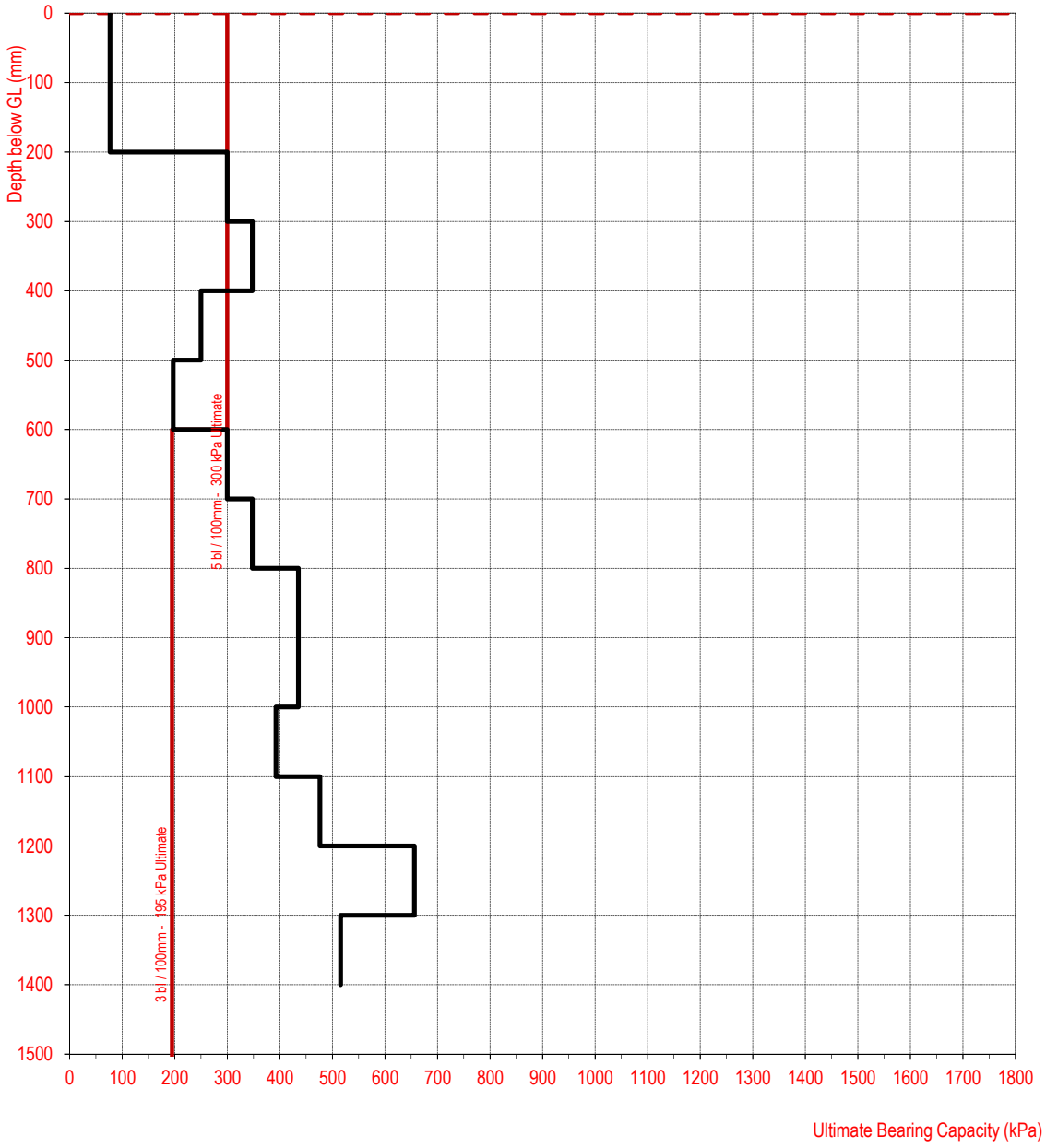
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**2**	**50**	**140**
100-200	**6**	**17**	**347**
200-300	**5**	**20**	**300**
300-400	**6**	**17**	**347**
400-500	**3**	**33**	**197**
500-600	**4**	**25**	**250**
600-700	**3**	**33**	**197**
700-800	**4**	**25**	**250**
800-900	**5**	**20**	**300**
900-1000	**5**	**20**	**300**
1000-1100	**5**	**20**	**300**
1100-1200	**5**	**20**	**300**
1200-1300	**3**	**33**	**197**
1300-1400	**5**	**20**	**300**
1400-1500			

Test Date: **05-12-14**

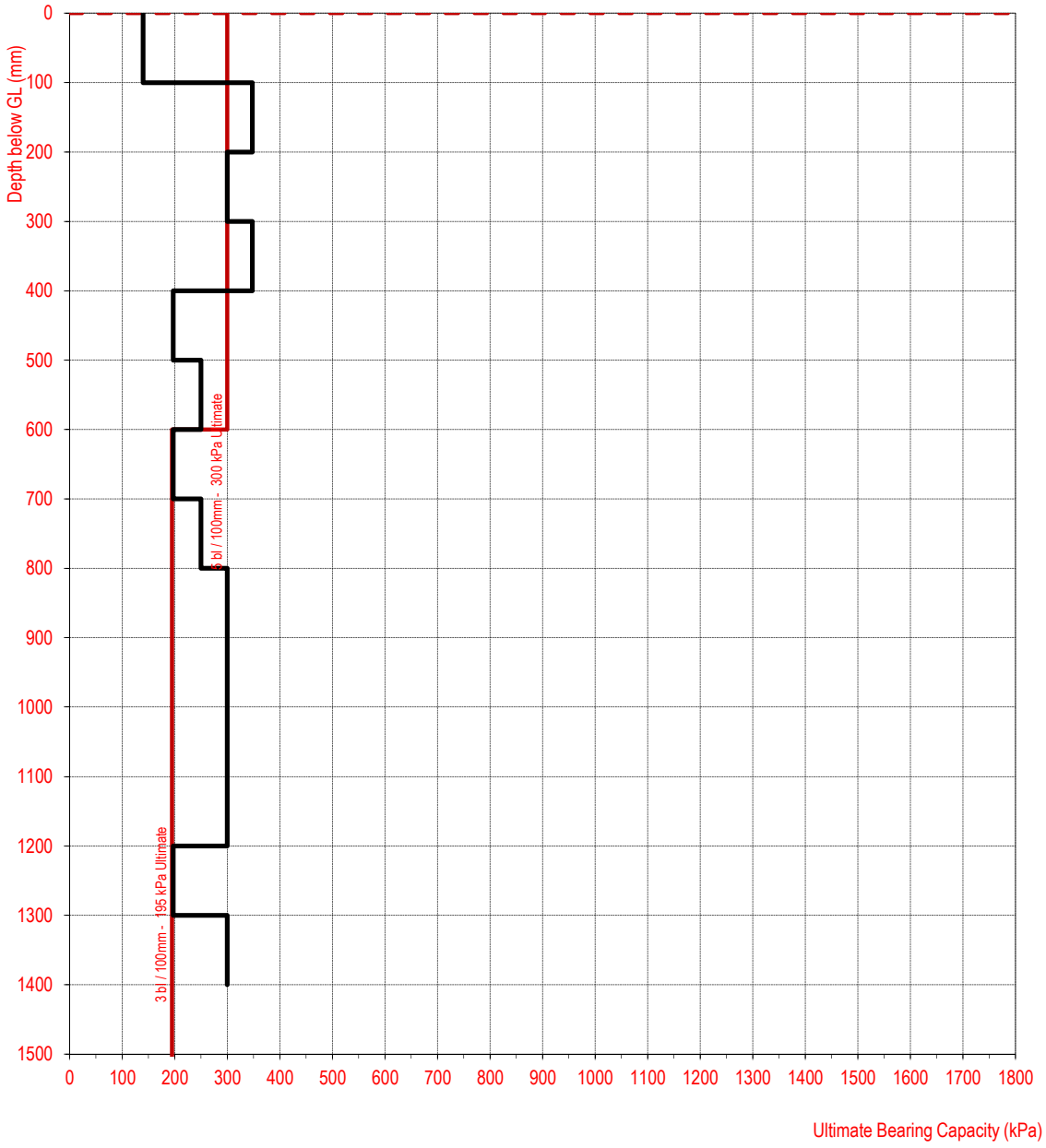
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**4**	**25**	**250**
100-200	**5**	**20**	**300**
200-300	**5**	**20**	**300**
300-400	**5**	**20**	**300**
400-500	**4**	**25**	**250**
500-600	**4**	**25**	**250**
600-700	**4**	**25**	**250**
700-800	**4**	**25**	**250**
800-900	**6**	**17**	**347**
900-1000	**6**	**17**	**347**
1000-1100	**3**	**33**	**197**
1100-1200	**3**	**33**	**197**
1200-1300	**4**	**25**	**250**
1300-1400	**5**	**20**	**300**
1400-1500			

Test Date: **05-12-14**

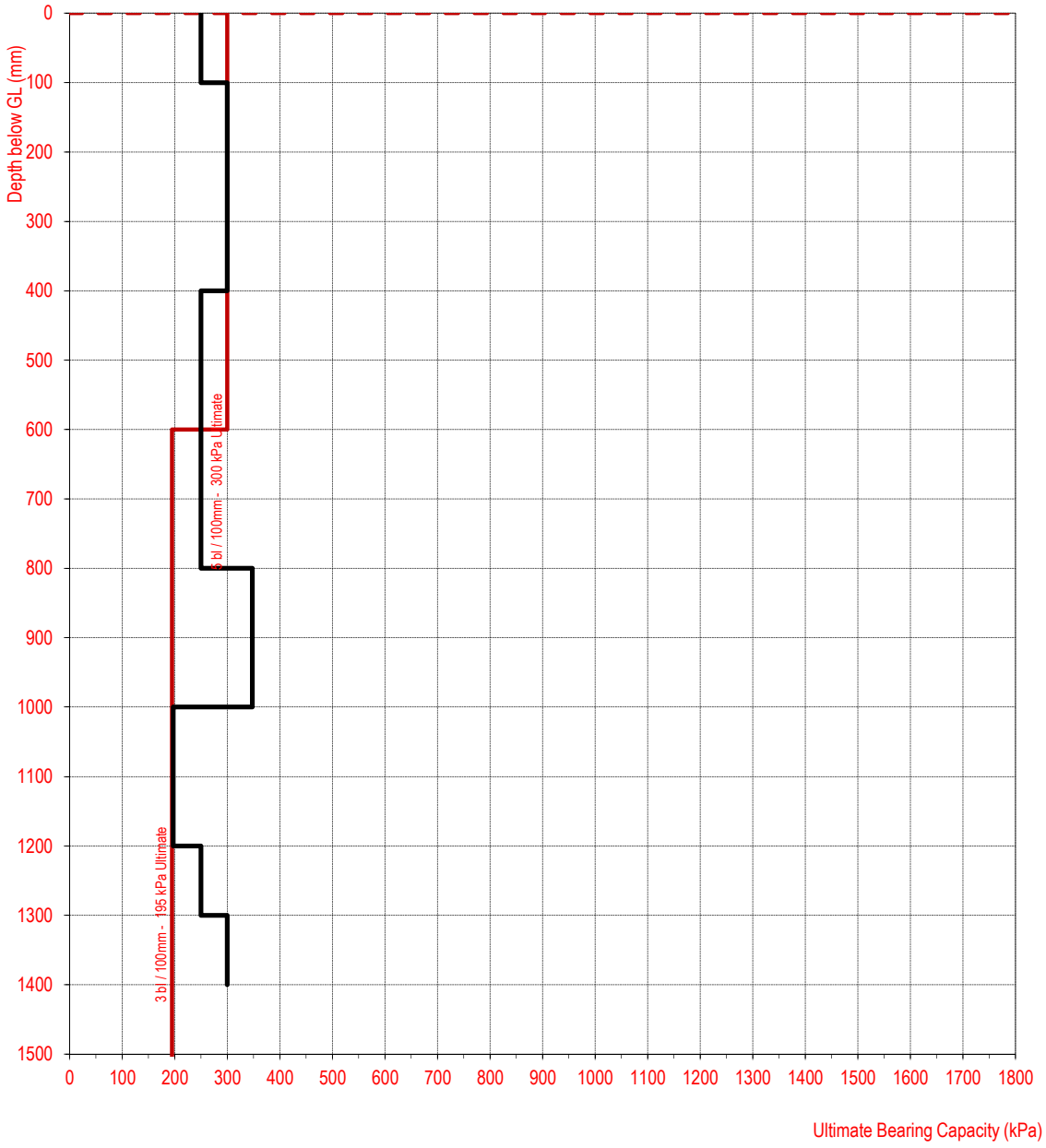
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**2**	**50**	**140**
100-200	**4**	**25**	**250**
200-300	**5**	**20**	**300**
300-400	**6**	**17**	**347**
400-500	**6**	**17**	**347**
500-600	**5**	**20**	**300**
600-700	**5**	**20**	**300**
700-800	**4**	**25**	**250**
800-900	**3**	**33**	**197**
900-1000	**3**	**33**	**197**
1000-1100	**6**	**17**	**347**
1100-1200	**4**	**25**	**250**
1200-1300	**3**	**33**	**197**
1300-1400	**4**	**25**	**250**
1400-1500			

Test Date: **05-12-14**

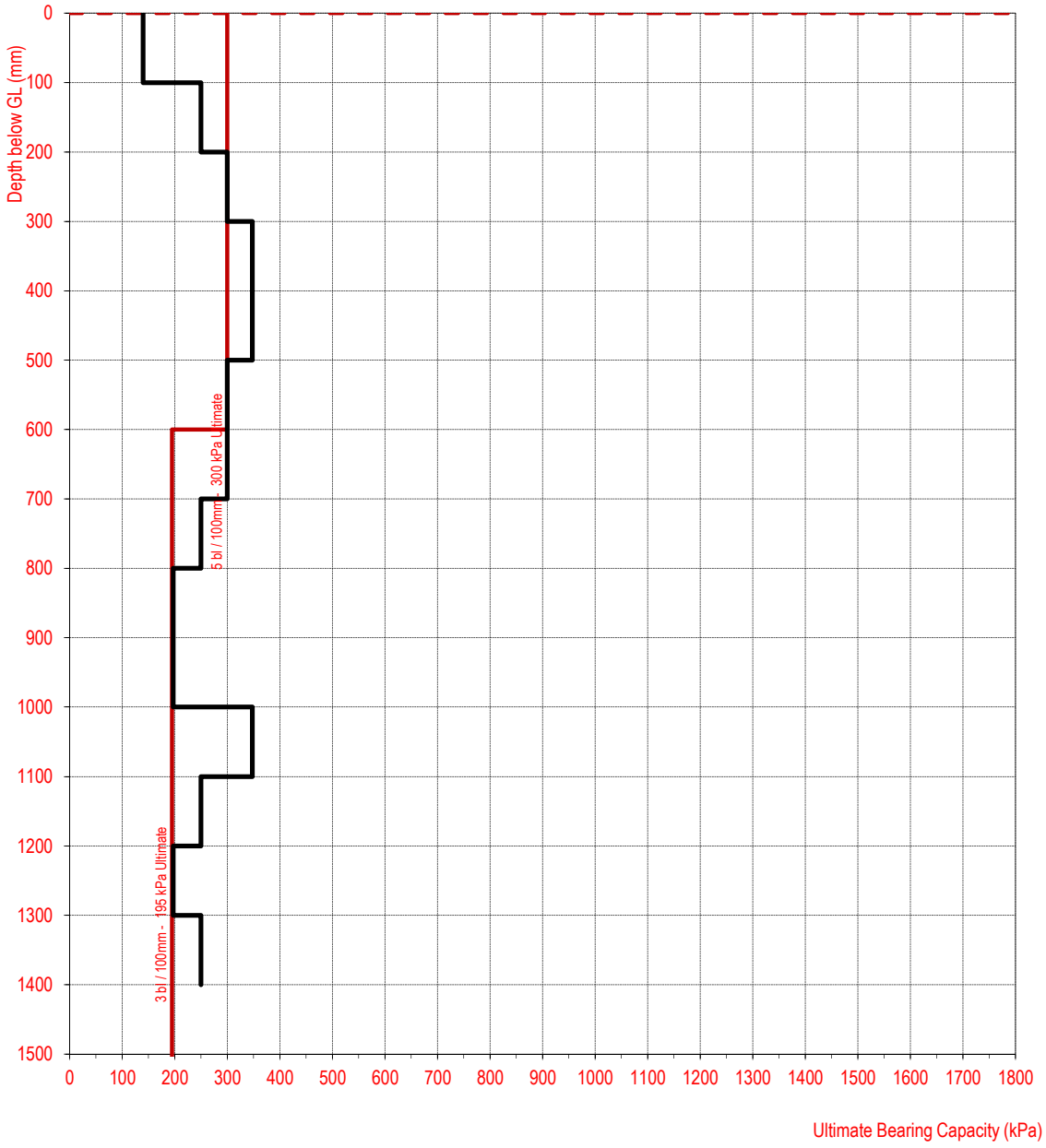
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **14**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**1**	**100**	**77**
100-200	**2**	**50**	**140**
200-300	**6**	**17**	**347**
300-400	**8**	**13**	**435**
400-500	**8**	**13**	**435**
500-600	**17**	**6**	**747**
600-700	**11**	**9**	**553**
700-800	**8**	**13**	**435**
800-900	**11**	**9**	**553**
900-1000	**7**	**14**	**392**
1000-1100	**13**	**8**	**623**
1100-1200	**14**	**7**	**656**
1200-1300	**18**	**6**	**775**
1300-1400	**22**	**5**	**876**
1400-1500			

Test Date: **05-12-14**

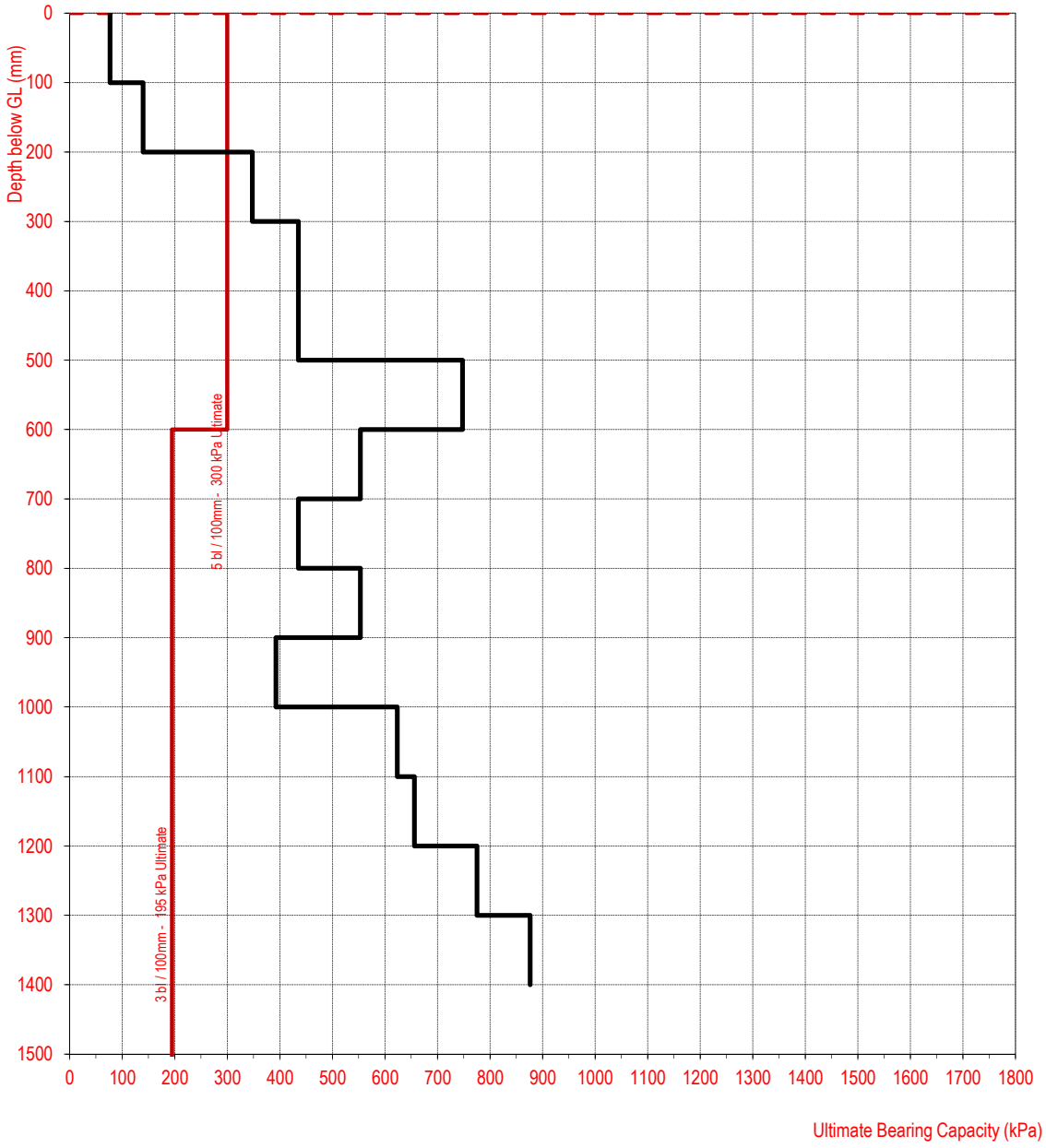
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	2	50	140
100-200	8	13	435
200-300	9	11	476
300-400	15	7	688
400-500	13	8	623
500-600	15	7	688
600-700	16	6	718
700-800	20	5	828
800-900	33	3	1078
900-1000	21	5	853
1000-1100	20	5	828
1100-1200	18	6	775
1200-1300	28	4	999
1300-1400	28	4	999
1400-1500			

Test Date: **05-12-14**

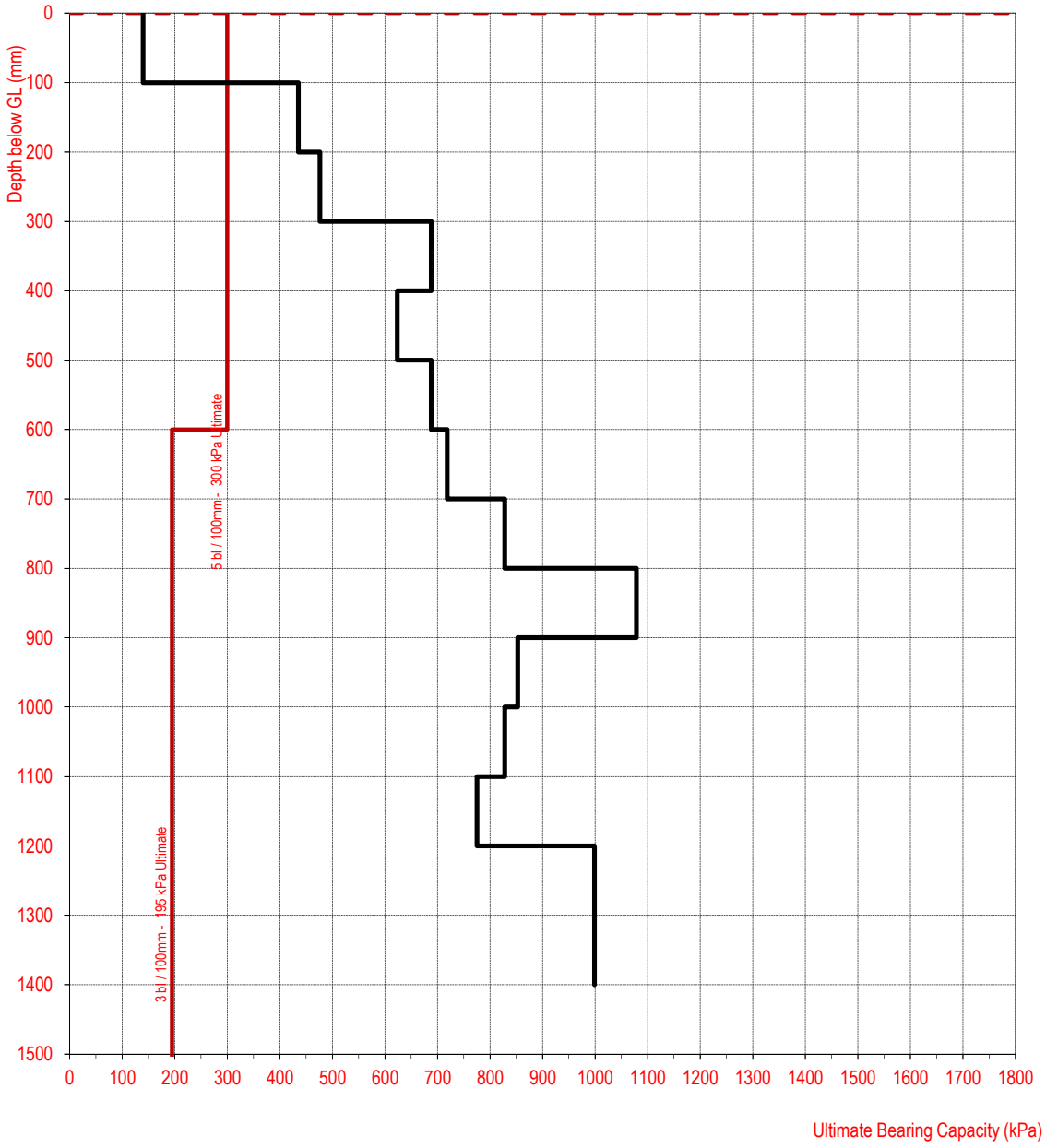
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	2	50	140
100-200	8	13	435
200-300	13	8	623
300-400	13	8	623
400-500	16	6	718
500-600	11	9	553
600-700	12	8	589
700-800	12	8	589
800-900	13	8	623
900-1000	13	8	623
1000-1100	12	8	589
1100-1200	31	3	1049
1200-1300	20	5	828
1300-1400	34	3	1092
1400-1500			

Test Date: **05-12-14**

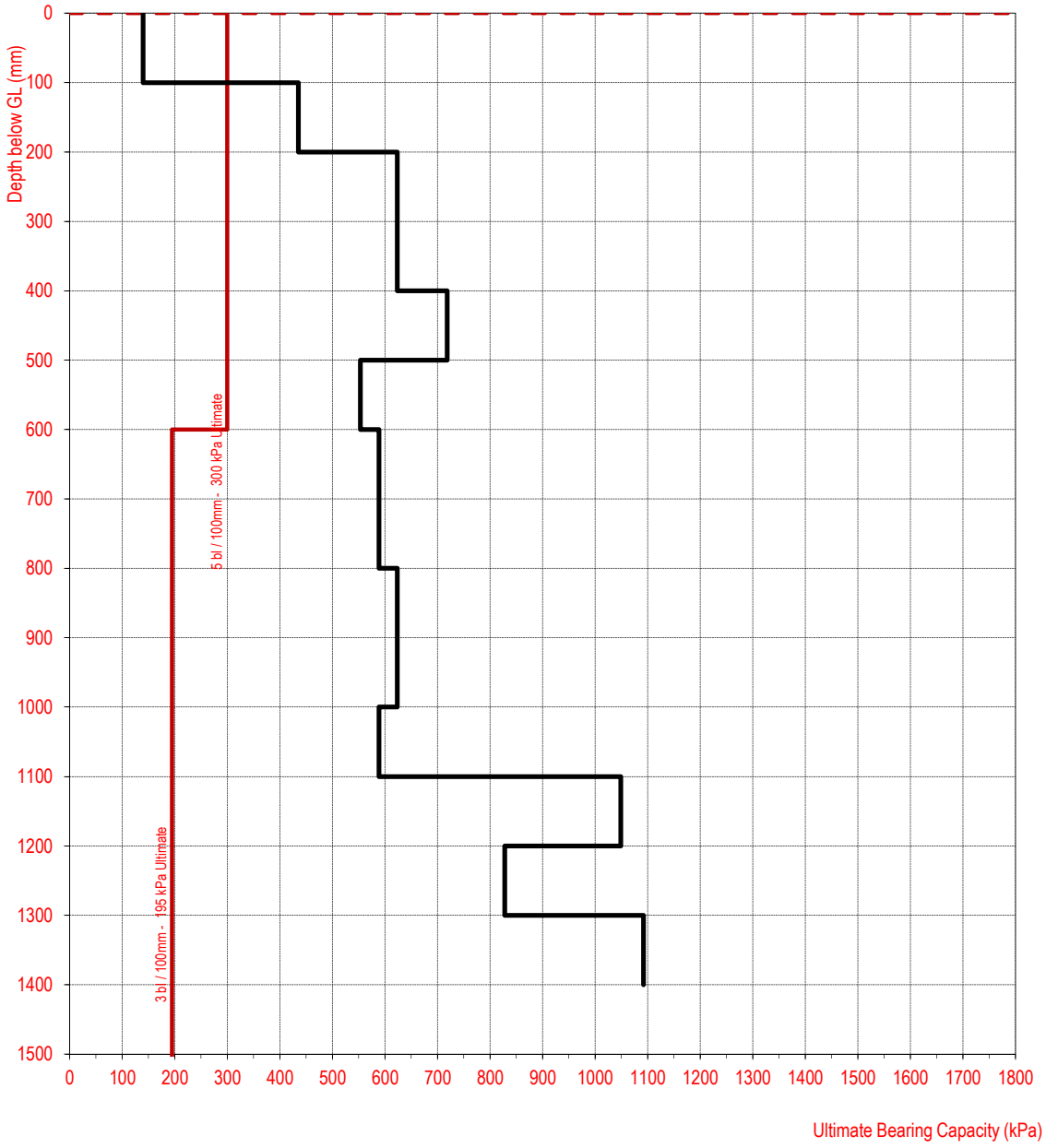
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	5	20	300
200-300	4	25	250
300-400	3	33	197
400-500	5	20	300
500-600	4	25	250
600-700	4	25	250
700-800	9	11	476
800-900	16	6	718
900-1000	19	5	802
1000-1100	21	5	853
1100-1200	21	5	853
1200-1300	12	8	589
1300-1400	17	6	747
1400-1500			

Test Date: **05-12-14**

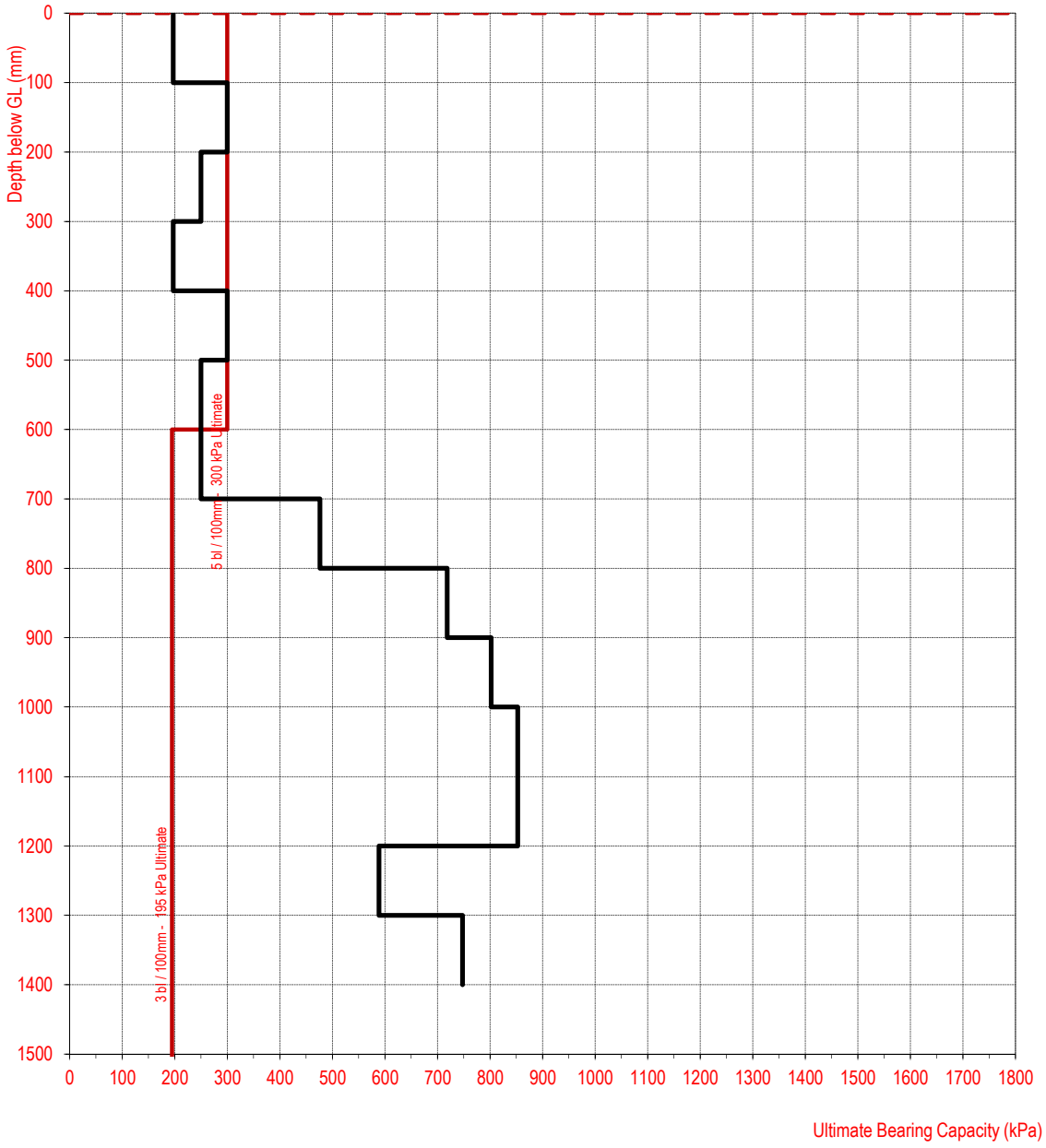
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**1**	**100**	**77**
100-200	**6**	**17**	**347**
200-300	**6**	**17**	**347**
300-400	**7**	**14**	**392**
400-500	**8**	**13**	**435**
500-600	**7**	**14**	**392**
600-700	**8**	**13**	**435**
700-800	**14**	**7**	**656**
800-900	**11**	**9**	**553**
900-1000	**11**	**9**	**553**
1000-1100	**18**	**6**	**775**
1100-1200	**19**	**5**	**802**
1200-1300	**15**	**7**	**688**
1300-1400	**11**	**9**	**553**
1400-1500			

Test Date: **05-12-14**

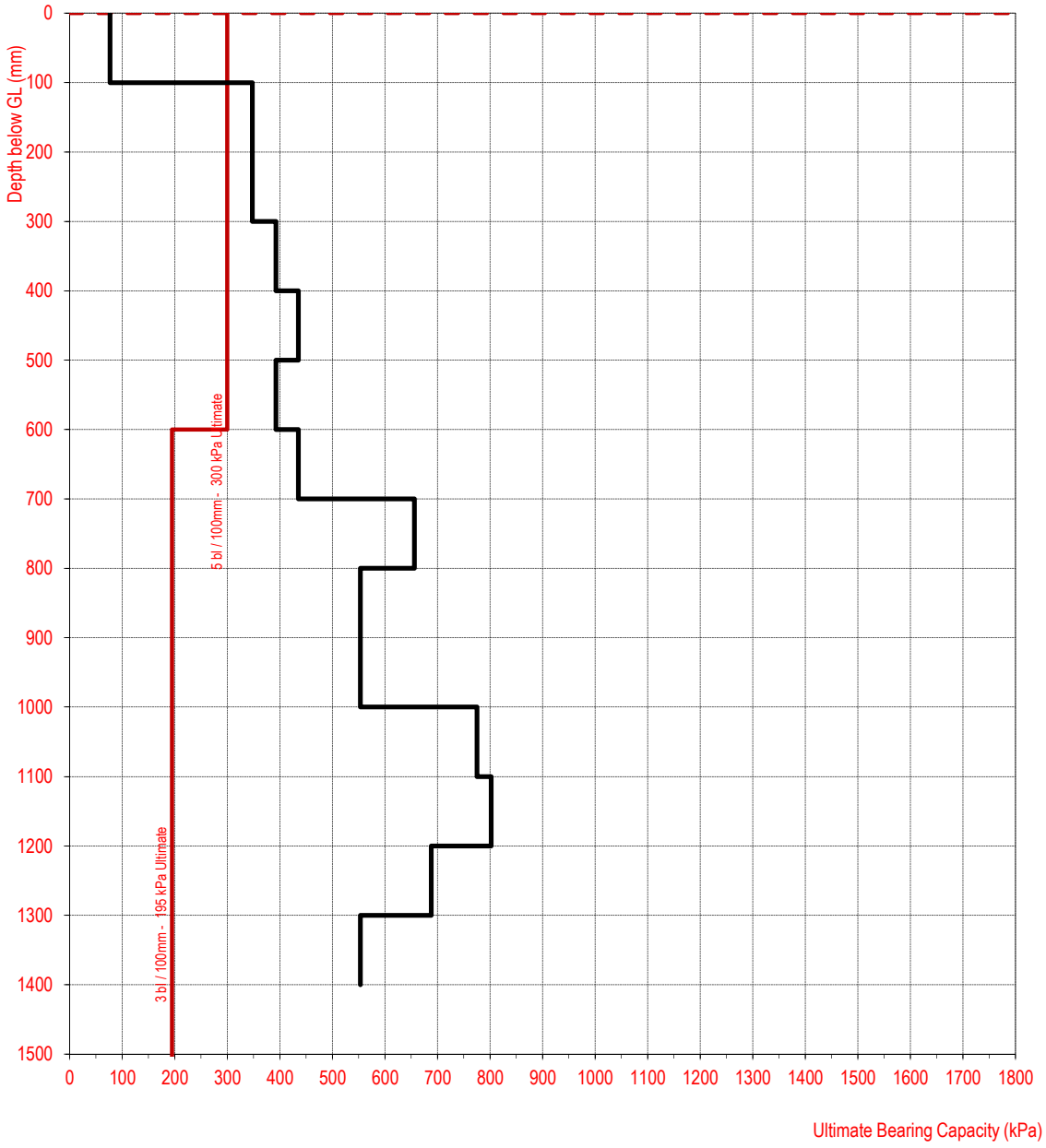
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	5	20	300
100-200	5	20	300
200-300	5	20	300
300-400	7	14	392
400-500	5	20	300
500-600	6	17	347
600-700	8	13	435
700-800	6	17	347
800-900	7	14	392
900-1000	10	10	516
1000-1100	18	6	775
1100-1200	15	7	688
1200-1300	11	9	553
1300-1400	12	8	589
1400-1500			

Test Date: **05-12-14**

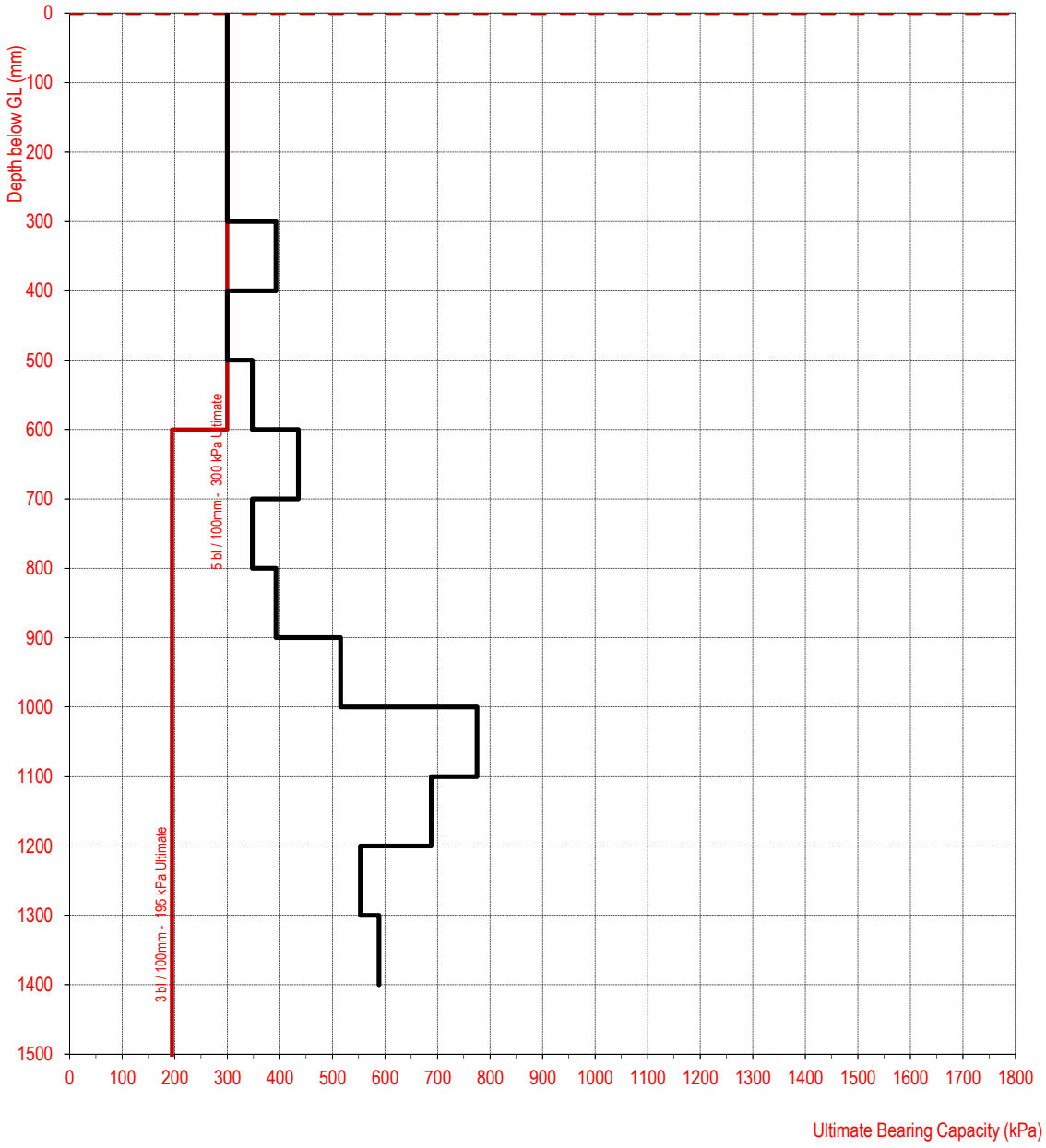
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **16**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	8	13	435
100-200	7	14	392
200-300	5	20	300
300-400	9	11	476
400-500	8	13	435
500-600	10	10	516
600-700	11	9	553
700-800	12	8	589
800-900	18	6	775
900-1000	28	4	999
1000-1100	14	7	656
1100-1200	24	4	921
1200-1300	16	6	718
1300-1400	26	4	961
1400-1500			

Test Date: **05-12-14**

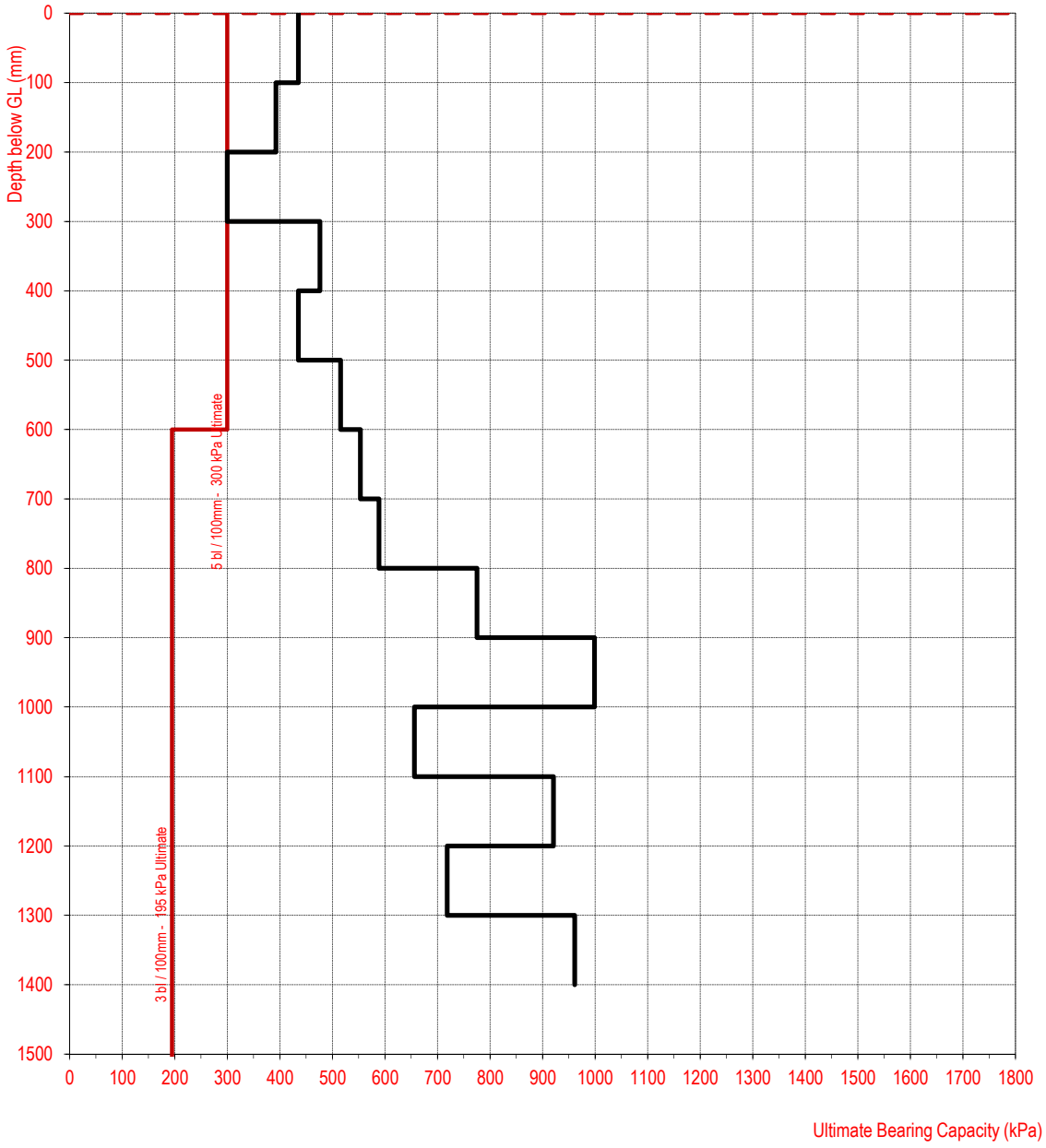
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**12**	**8**	**589**
100-200	**14**	**7**	**656**
200-300	**11**	**9**	**553**
300-400	**18**	**6**	**775**
400-500	**29**	**3**	**1016**
500-600	**26**	**4**	**961**
600-700	**47**	**2**	**1218**
700-800	**66**	**2**	**1270**
800-900	**39**	**3**	**1152**
900-1000	**31**	**3**	**1049**
1000-1100	**60**	**2**	**1266**
1100-1200			
1200-1300			
1300-1400			
1400-1500			

Test Date: **05-12-14**

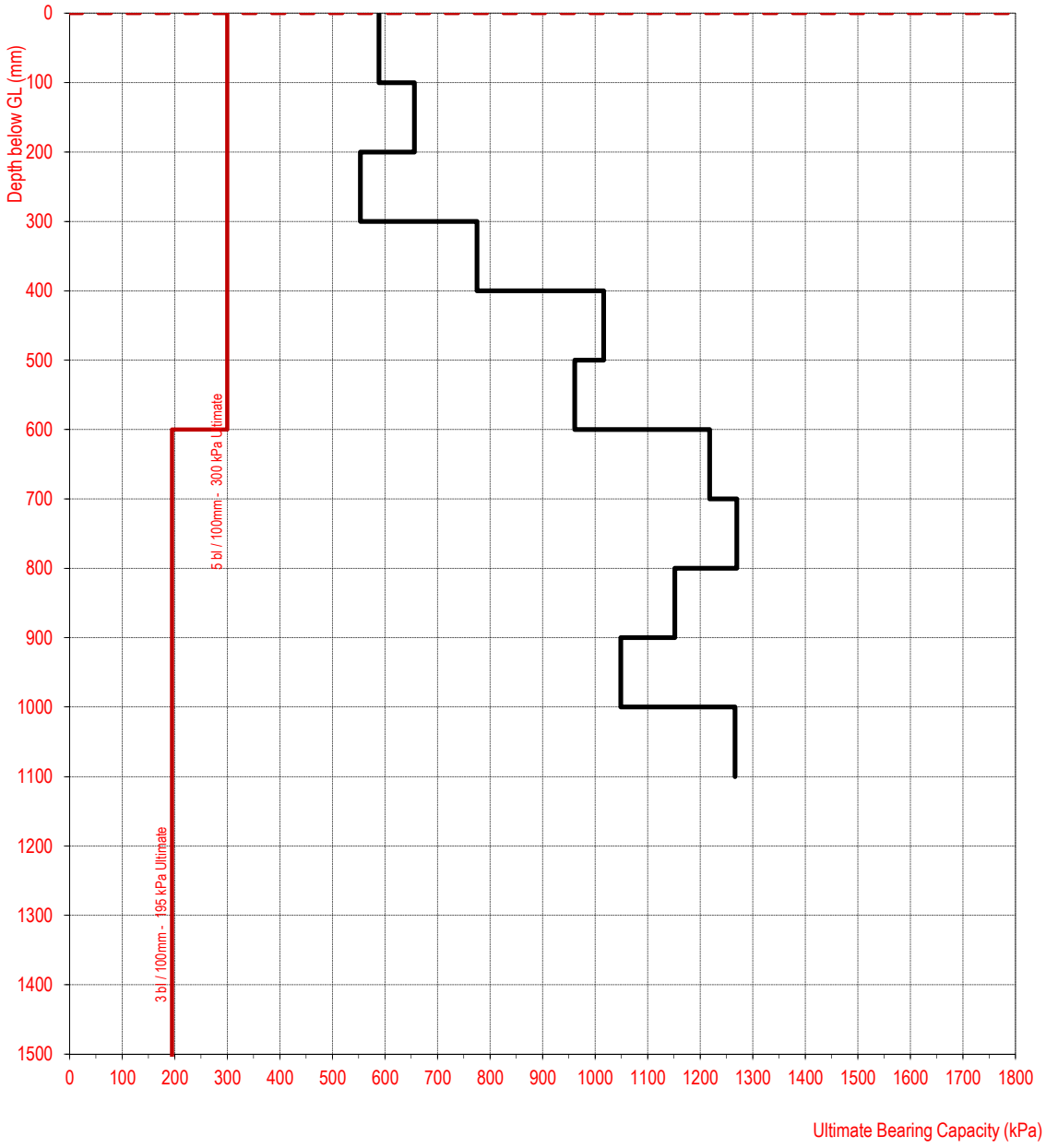
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	7	14	392
100-200	11	9	553
200-300	5	20	300
300-400	7	14	392
400-500	6	17	347
500-600	7	14	392
600-700	16	6	718
700-800	21	5	853
800-900	25	4	941
900-1000	30	3	1033
1000-1100	53	2	1248
1100-1200	44	2	1197
1200-1300	54	2	1252
1300-1400	64	2	1270
1400-1500			

Test Date: **05-12-14**

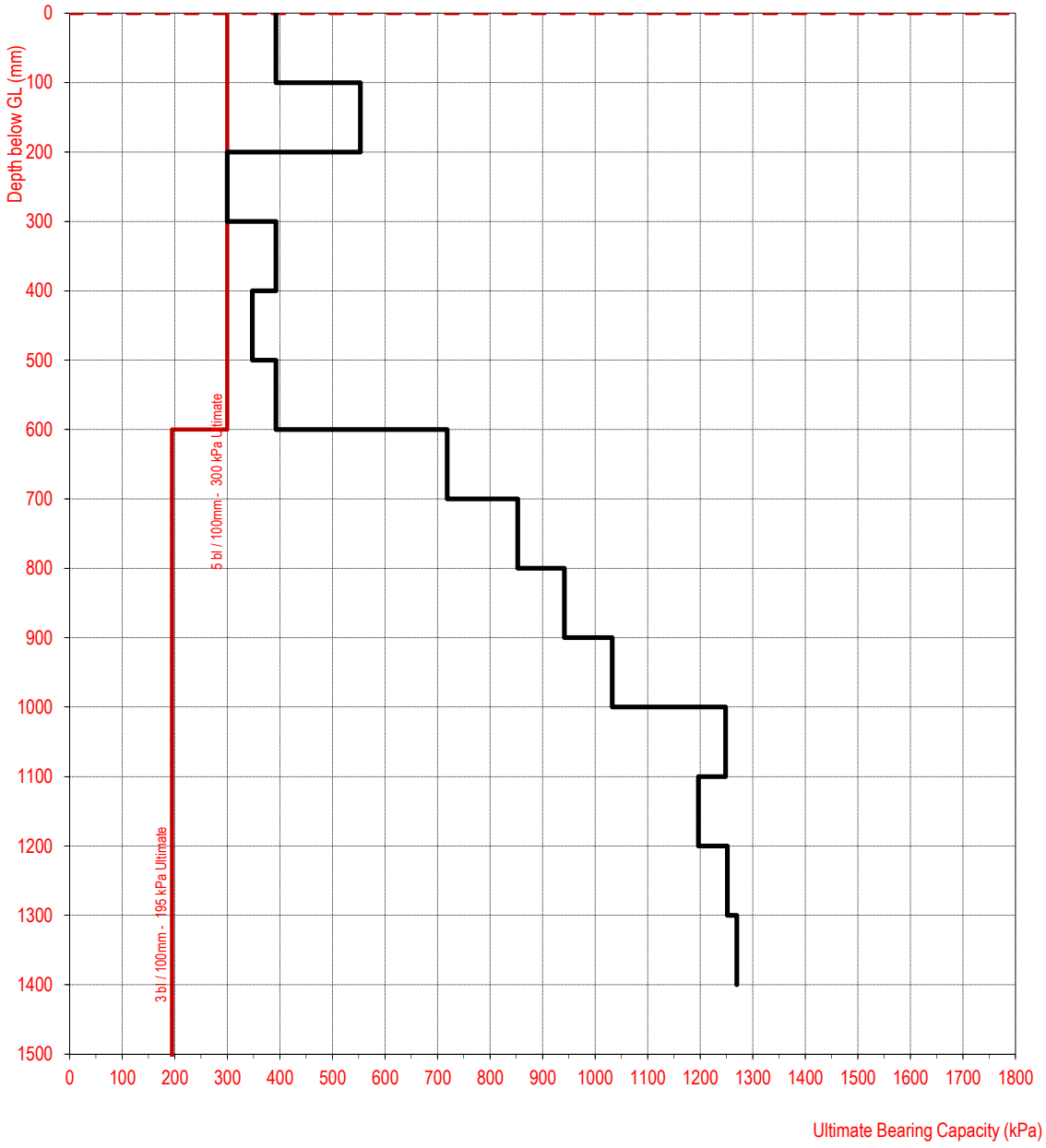
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	7	14	392
100-200	7	14	392
200-300	10	10	516
300-400	10	10	516
400-500	9	11	476
500-600	7	14	392
600-700	8	13	435
700-800	11	9	553
800-900	26	4	961
900-1000	29	3	1016
1000-1100	22	5	876
1100-1200	18	6	775
1200-1300	19	5	802
1300-1400	25	4	941
1400-1500			

Test Date: **05-12-14**

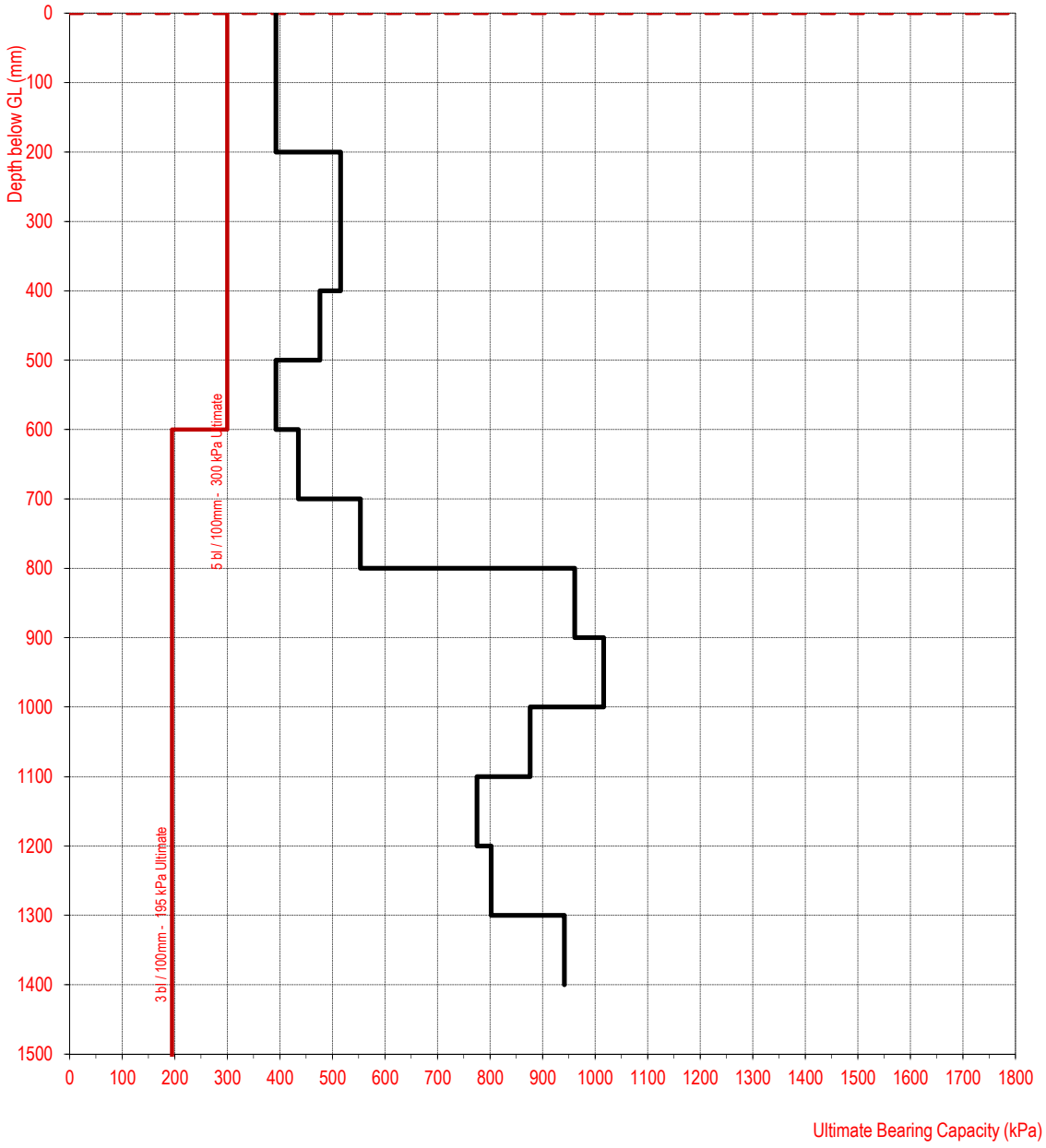
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**6**	**17**	**347**
100-200	**9**	**11**	**476**
200-300	**16**	**6**	**718**
300-400	**15**	**7**	**688**
400-500	**25**	**4**	**941**
500-600	**13**	**8**	**623**
600-700	**19**	**5**	**802**
700-800	**46**	**2**	**1211**
800-900	**23**	**4**	**899**
900-1000	**28**	**4**	**999**
1000-1100	**49**	**2**	**1230**
1100-1200	**49**	**2**	**1230**
1200-1300	**57**	**2**	**1261**
1300-1400	**45**	**2**	**1204**
1400-1500			

Test Date: **05-12-14**

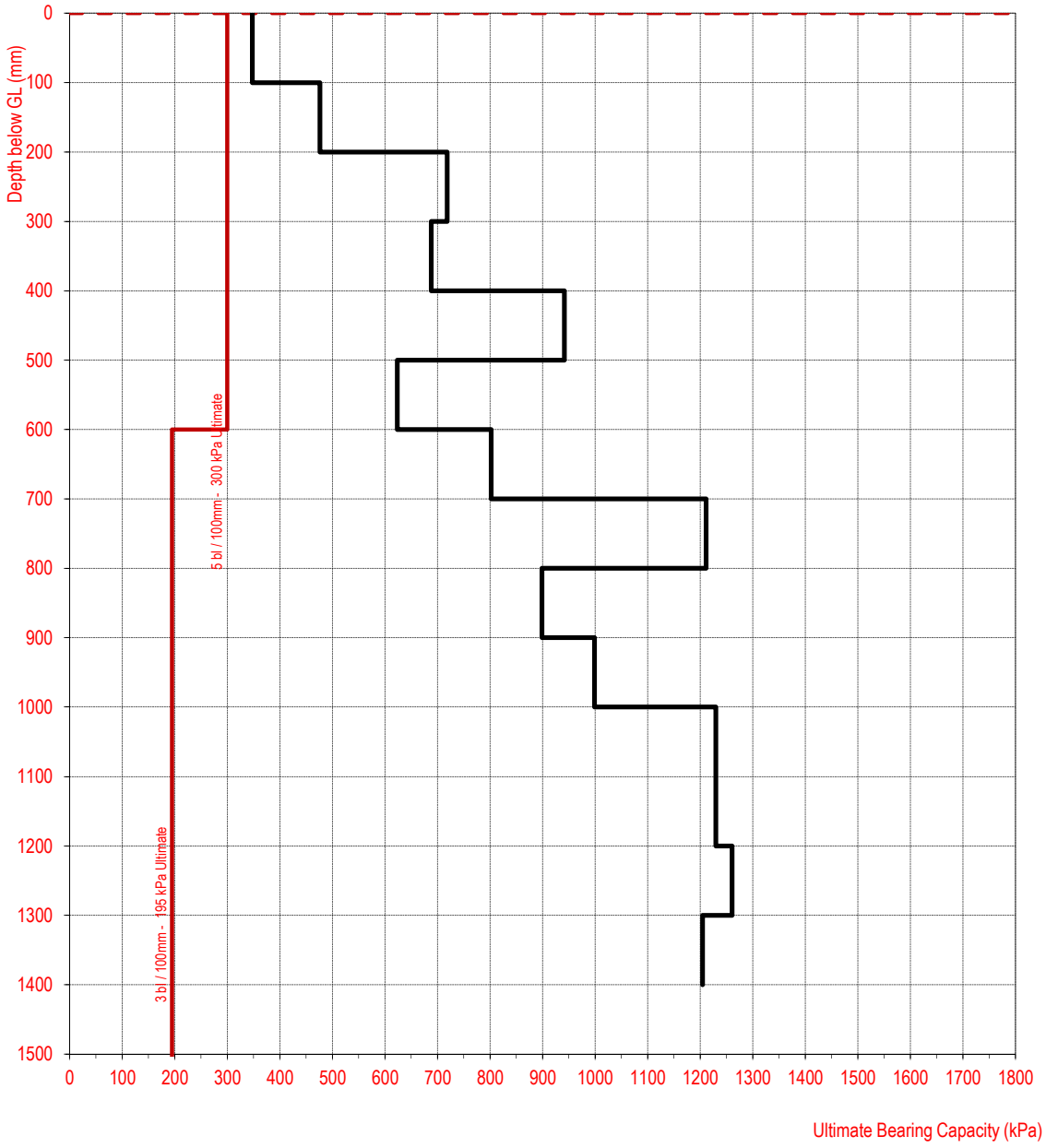
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**11**	**9**	**553**
100-200	**14**	**7**	**656**
200-300	**8**	**13**	**435**
300-400	**7**	**14**	**392**
400-500	**5**	**20**	**300**
500-600	**7**	**14**	**392**
600-700	**6**	**17**	**347**
700-800	**4**	**25**	**250**
800-900	**5**	**20**	**300**
900-1000	**4**	**25**	**250**
1000-1100	**6**	**17**	**347**
1100-1200	**9**	**11**	**476**
1200-1300	**7**	**14**	**392**
1300-1400	**14**	**7**	**656**
1400-1500			

Test Date: **05-12-14**

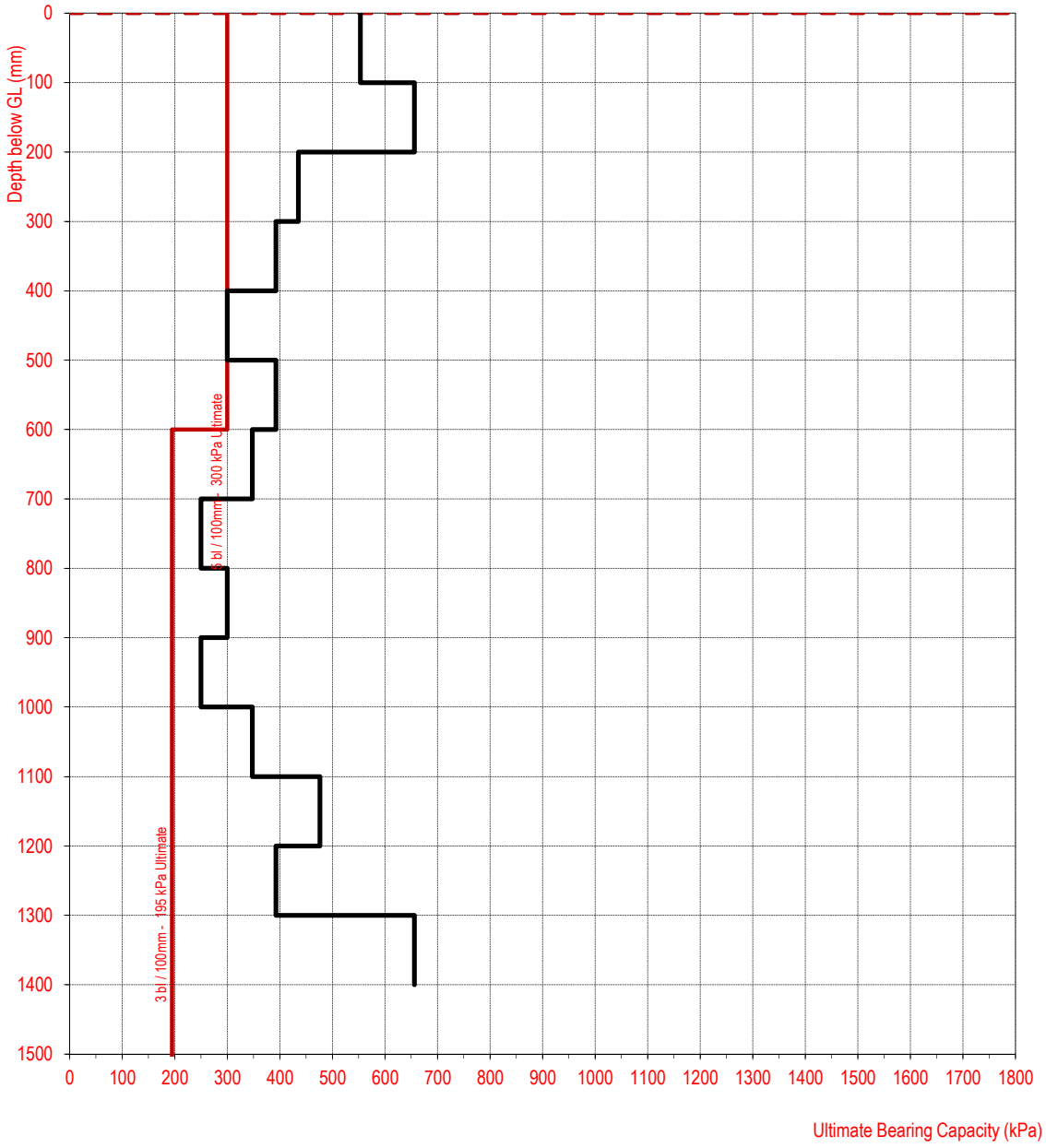
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **17**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**3**	**33**	**197**
100-200	**10**	**10**	**516**
200-300	**5**	**20**	**300**
300-400	**7**	**14**	**392**
400-500	**7**	**14**	**392**
500-600	**9**	**11**	**476**
600-700	**9**	**11**	**476**
700-800	**9**	**11**	**476**
800-900	**11**	**9**	**553**
900-1000	**12**	**8**	**589**
1000-1100	**15**	**7**	**688**
1100-1200	**14**	**7**	**656**
1200-1300	**29**	**3**	**1016**
1300-1400	**16**	**6**	**718**
1400-1500			

Test Date: **05-12-14**

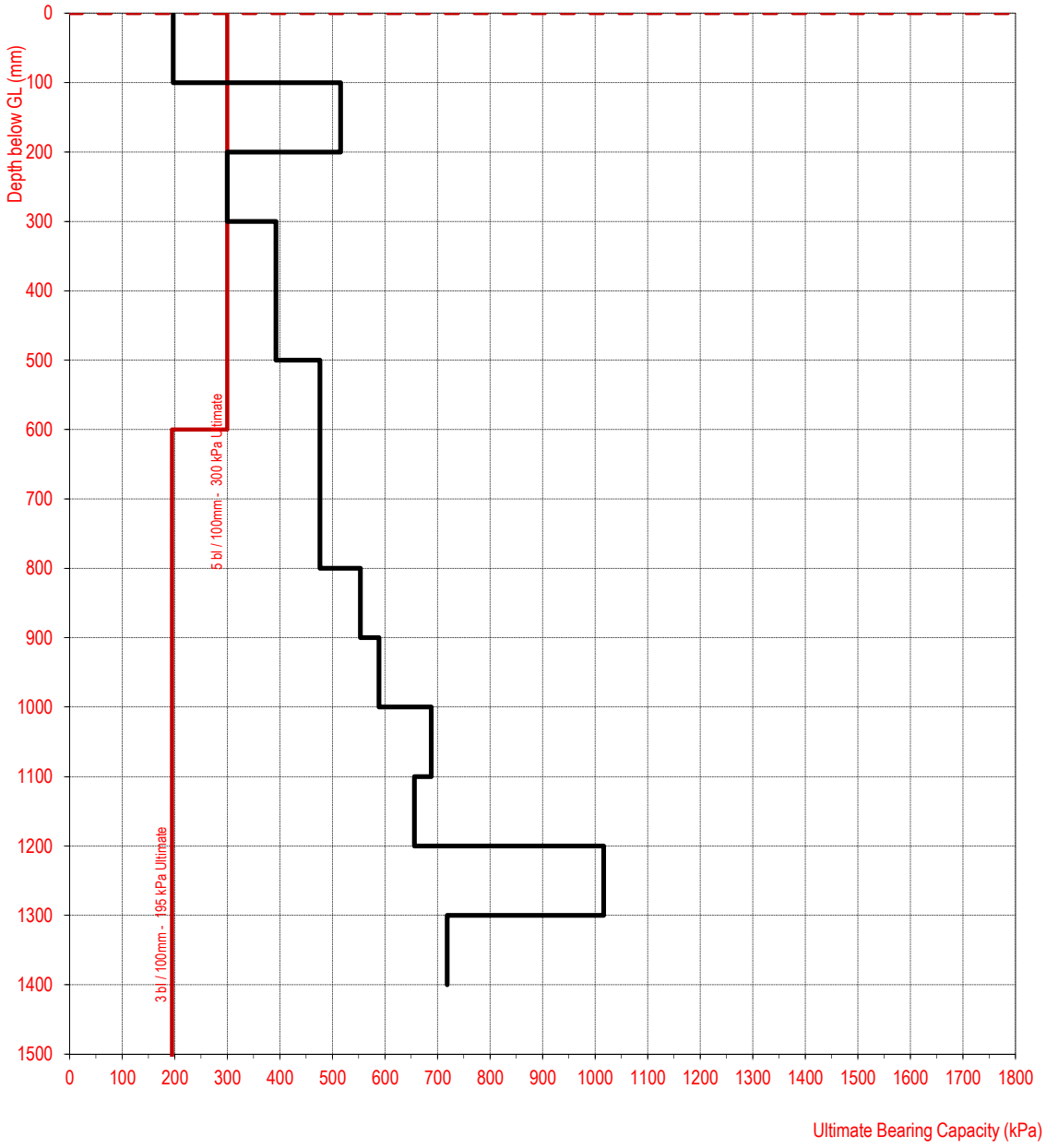
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	6	17	347
100-200	9	11	476
200-300	5	20	300
300-400	5	20	300
400-500	6	17	347
500-600	6	17	347
600-700	4	25	250
700-800	3	33	197
800-900	3	33	197
900-1000	6	17	347
1000-1100	4	25	250
1100-1200	4	25	250
1200-1300	16	6	718
1300-1400	7	14	392
1400-1500			

Test Date: **05-12-14**

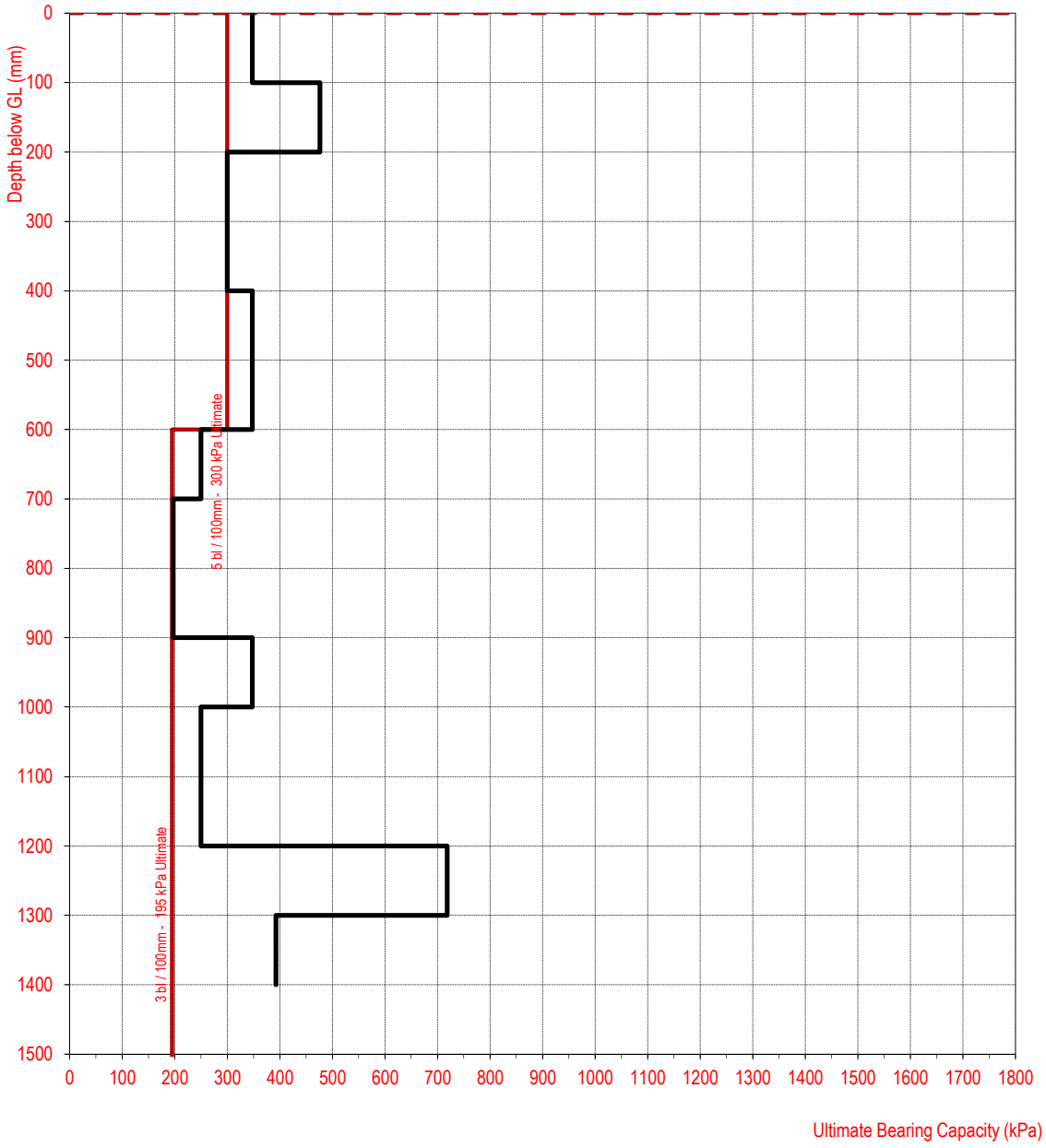
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**9**	**11**	**476**
100-200	**6**	**17**	**347**
200-300	**6**	**17**	**347**
300-400	**8**	**13**	**435**
400-500	**5**	**20**	**300**
500-600	**4**	**25**	**250**
600-700	**4**	**25**	**250**
700-800	**6**	**17**	**347**
800-900	**6**	**17**	**347**
900-1000	**5**	**20**	**300**
1000-1100	**5**	**20**	**300**
1100-1200	**5**	**20**	**300**
1200-1300	**6**	**17**	**347**
1300-1400	**6**	**17**	**347**
1400-1500			

Test Date: **05-12-14**

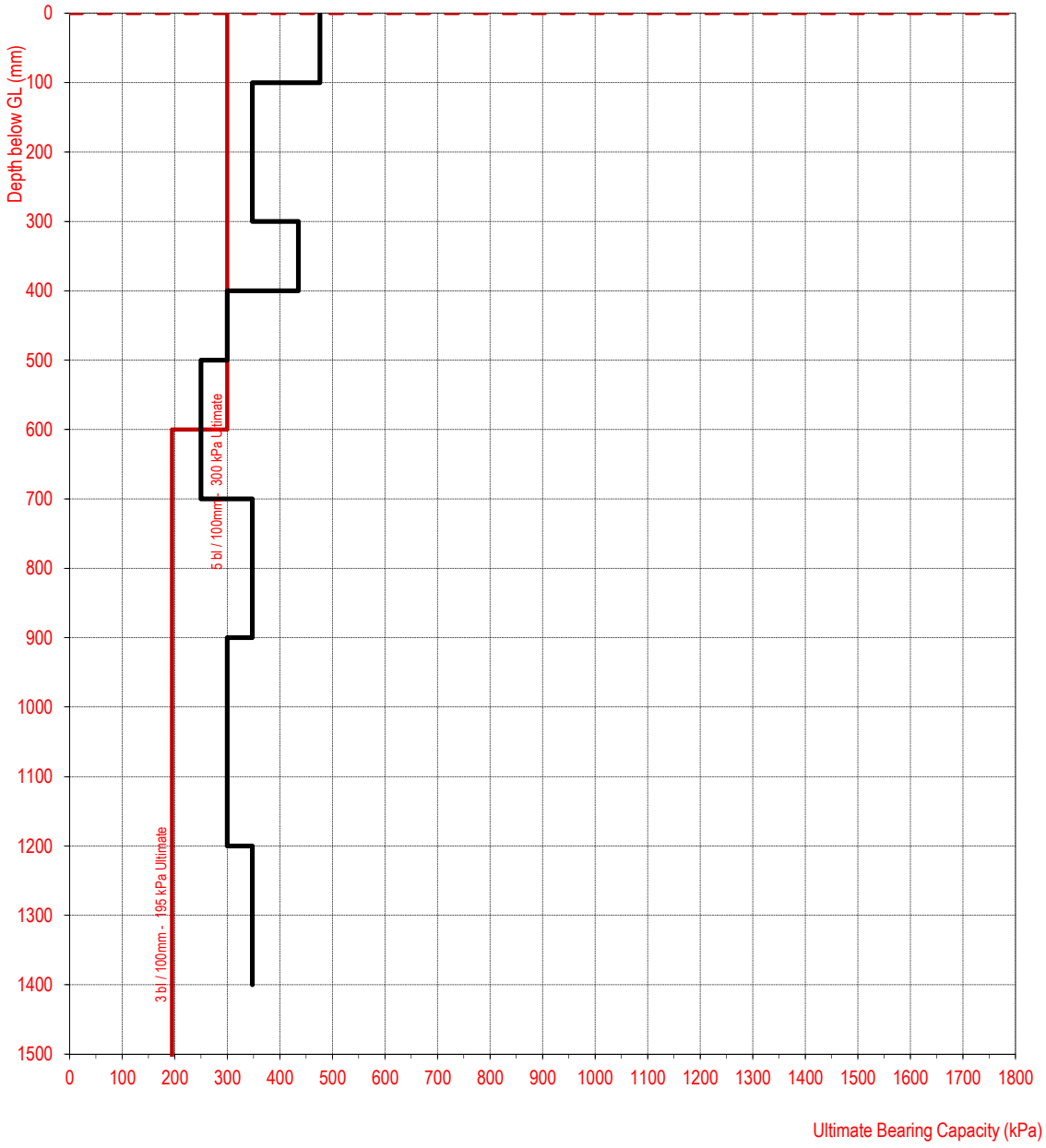
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	5	20	300
100-200	6	17	347
200-300	7	14	392
300-400	12	8	589
400-500	8	13	435
500-600	15	7	688
600-700	19	5	802
700-800	33	3	1078
800-900	21	5	853
900-1000	19	5	802
1000-1100	11	9	553
1100-1200	31	3	1049
1200-1300	29	3	1016
1300-1400	30	3	1033
1400-1500			

Test Date: **05-12-14**

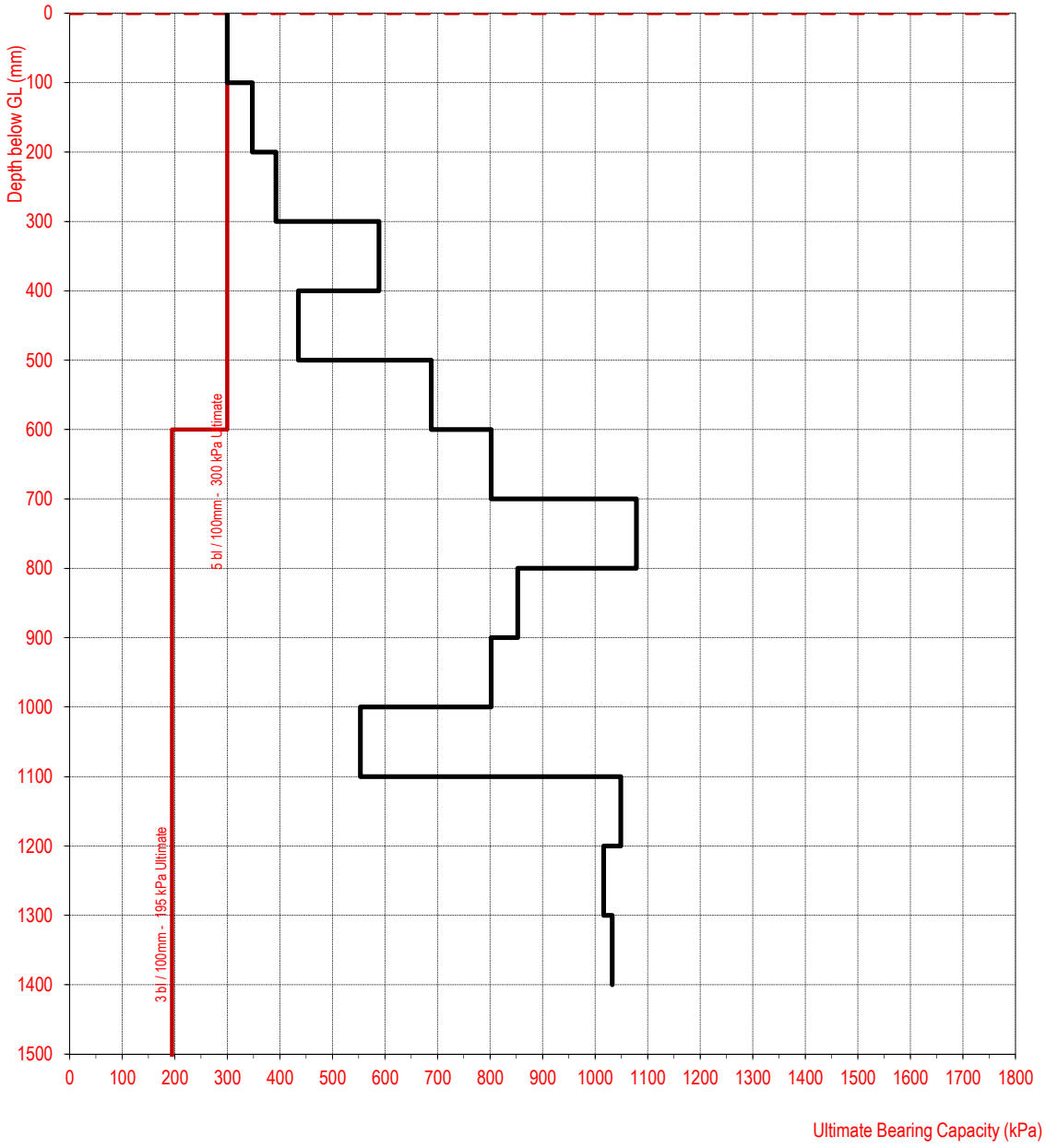
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	6	17	347
100-200	5	20	300
200-300	7	14	392
300-400	6	17	347
400-500	7	14	392
500-600	5	20	300
600-700	5	20	300
700-800	6	17	347
800-900	6	17	347
900-1000	5	20	300
1000-1100	7	14	392
1100-1200	5	20	300
1200-1300	6	17	347
1300-1400	12	8	589
1400-1500			

Test Date: **05-12-14**

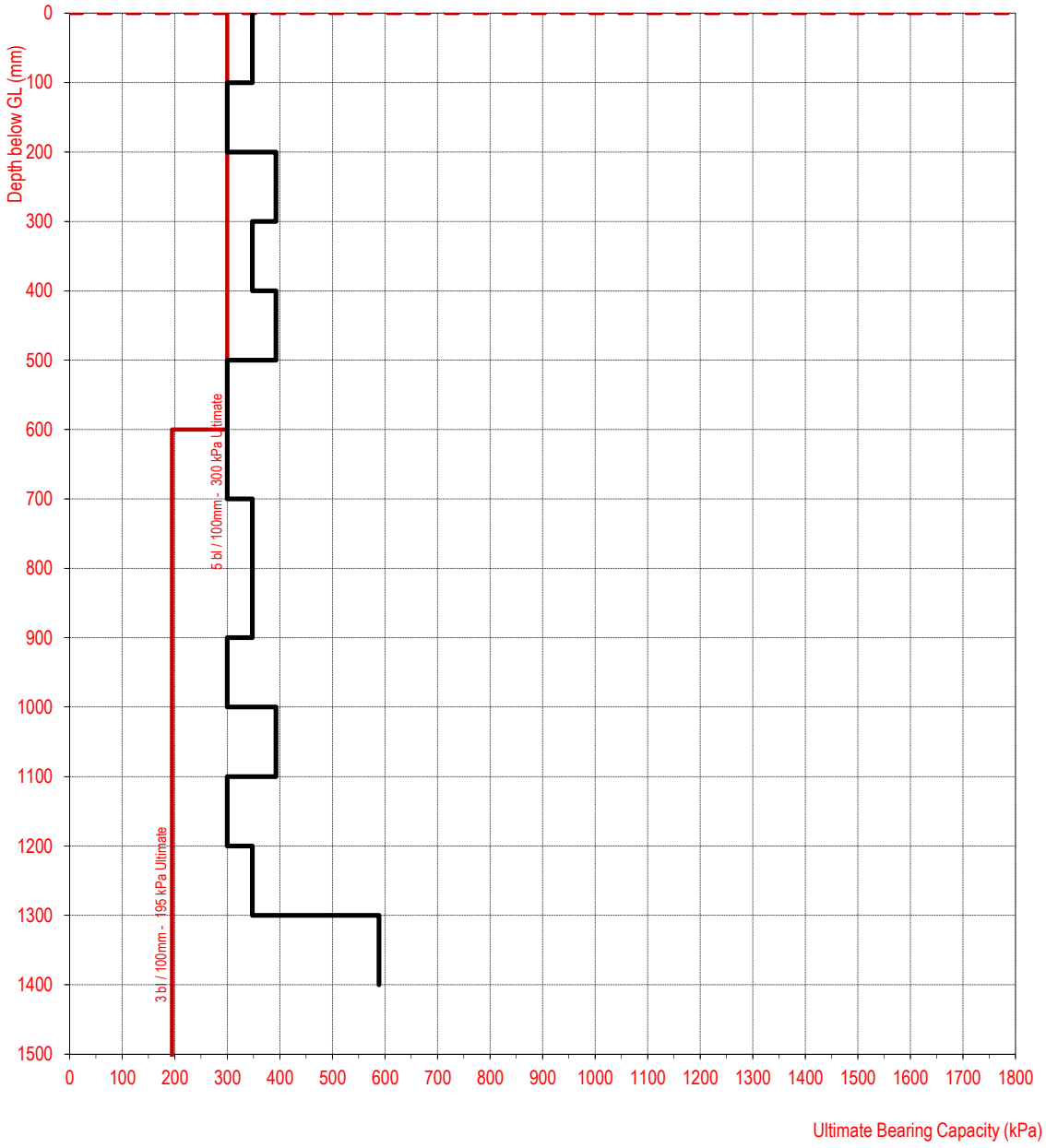
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	4	25	250
200-300	5	20	300
300-400	4	25	250
400-500	5	20	300
500-600	6	17	347
600-700	4	25	250
700-800	7	14	392
800-900	11	9	553
900-1000	11	9	553
1000-1100	7	14	392
1100-1200	23	4	899
1200-1300	28	4	999
1300-1400	21	5	853
1400-1500			

Test Date: **05-12-14**

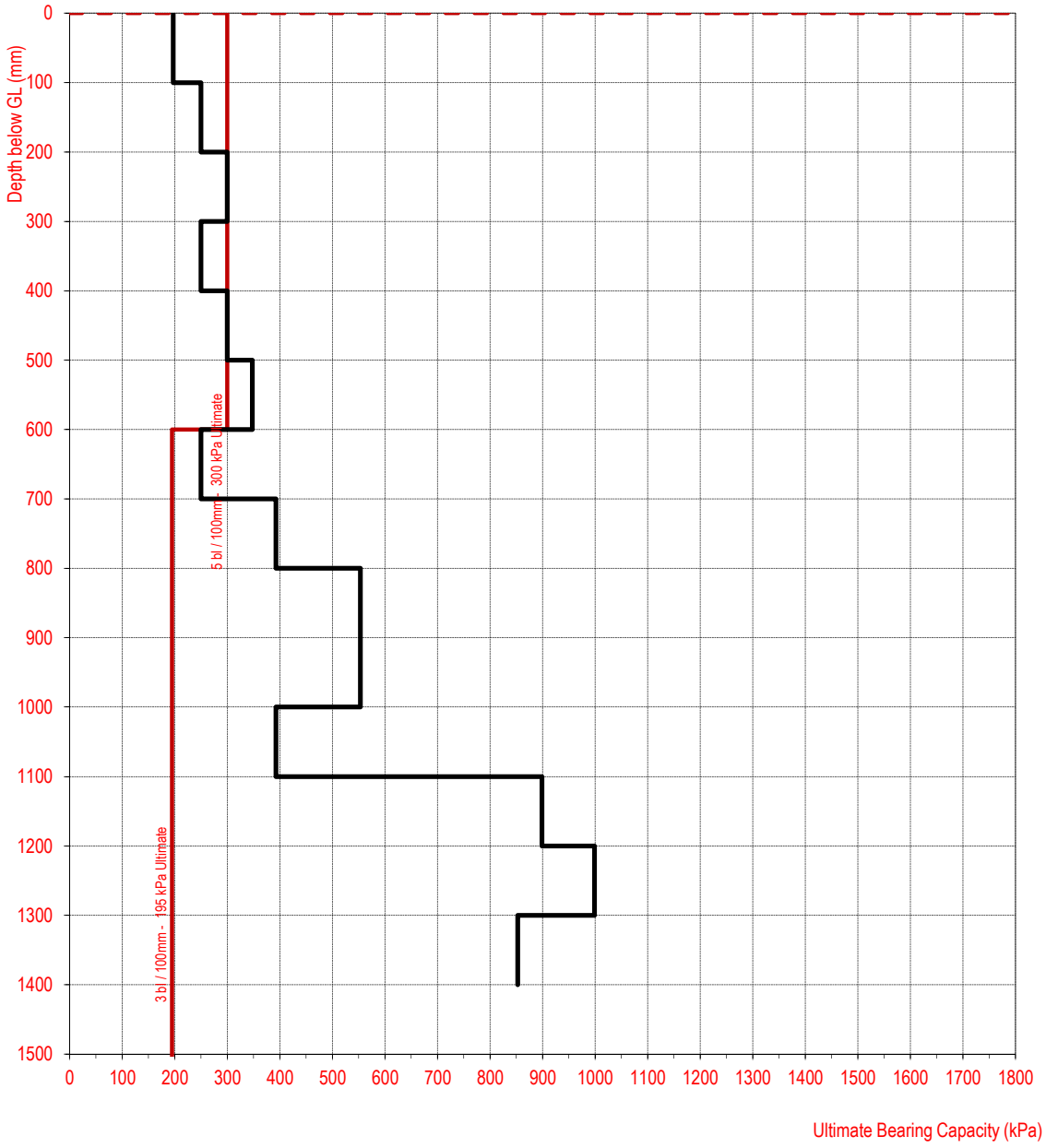
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **18**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**8**	**13**	**435**
100-200	**8**	**13**	**435**
200-300	**6**	**17**	**347**
300-400	**5**	**20**	**300**
400-500	**4**	**25**	**250**
500-600	**3**	**33**	**197**
600-700	**3**	**33**	**197**
700-800	**1**	**100**	**77**
800-900	**2**	**50**	**140**
900-1000	**6**	**17**	**347**
1000-1100	**4**	**25**	**250**
1100-1200	**3**	**33**	**197**
1200-1300	**3**	**33**	**197**
1300-1400	**11**	**9**	**553**
1400-1500			

Test Date: **05-12-14**

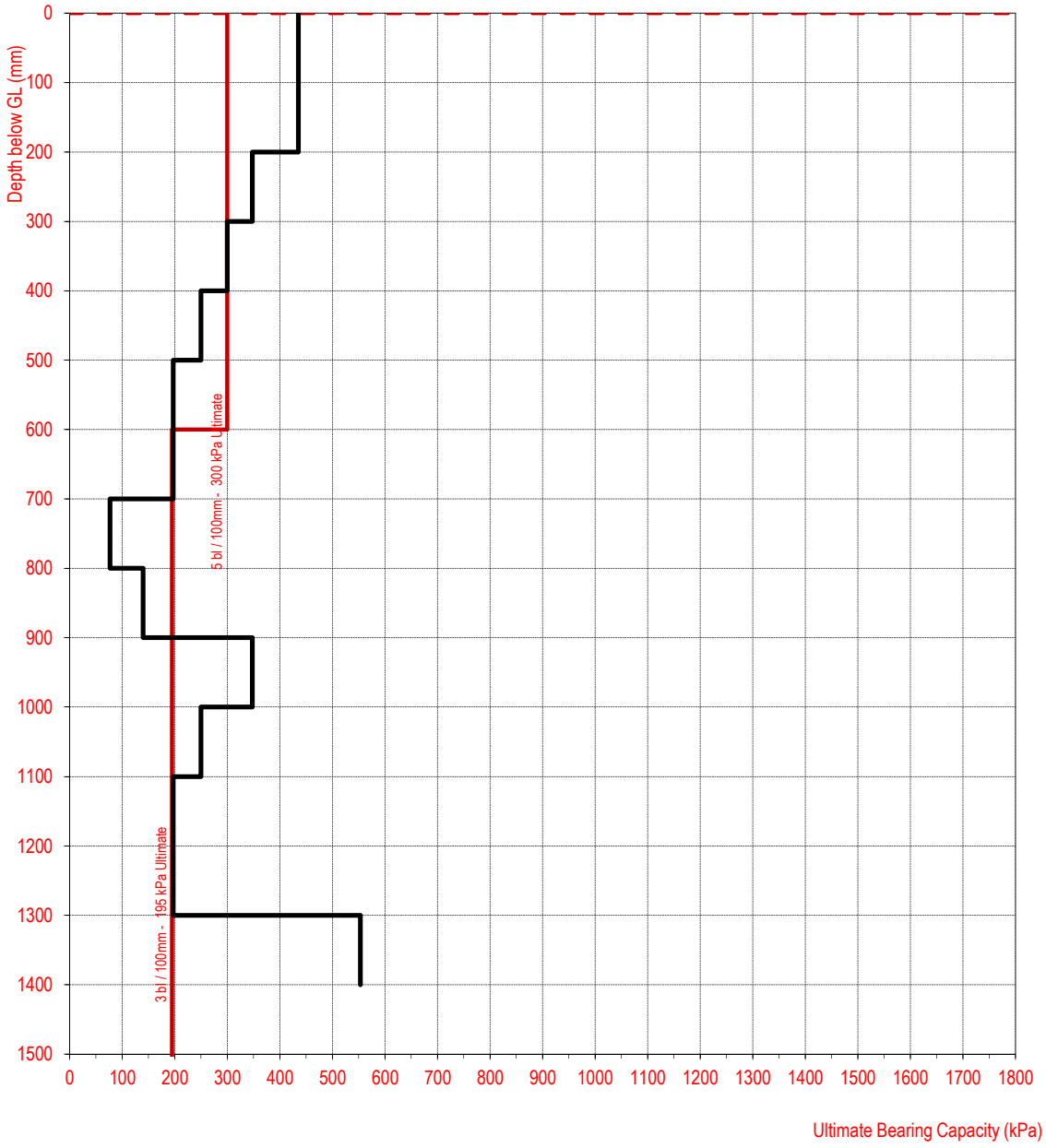
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	6	17	347
200-300	4	25	250
300-400	6	17	347
400-500	6	17	347
500-600	8	13	435
600-700	8	13	435
700-800	6	17	347
800-900	8	13	435
900-1000	8	13	435
1000-1100	11	9	553
1100-1200	9	11	476
1200-1300	11	9	553
1300-1400	12	8	589
1400-1500			

Test Date: **05-12-14**

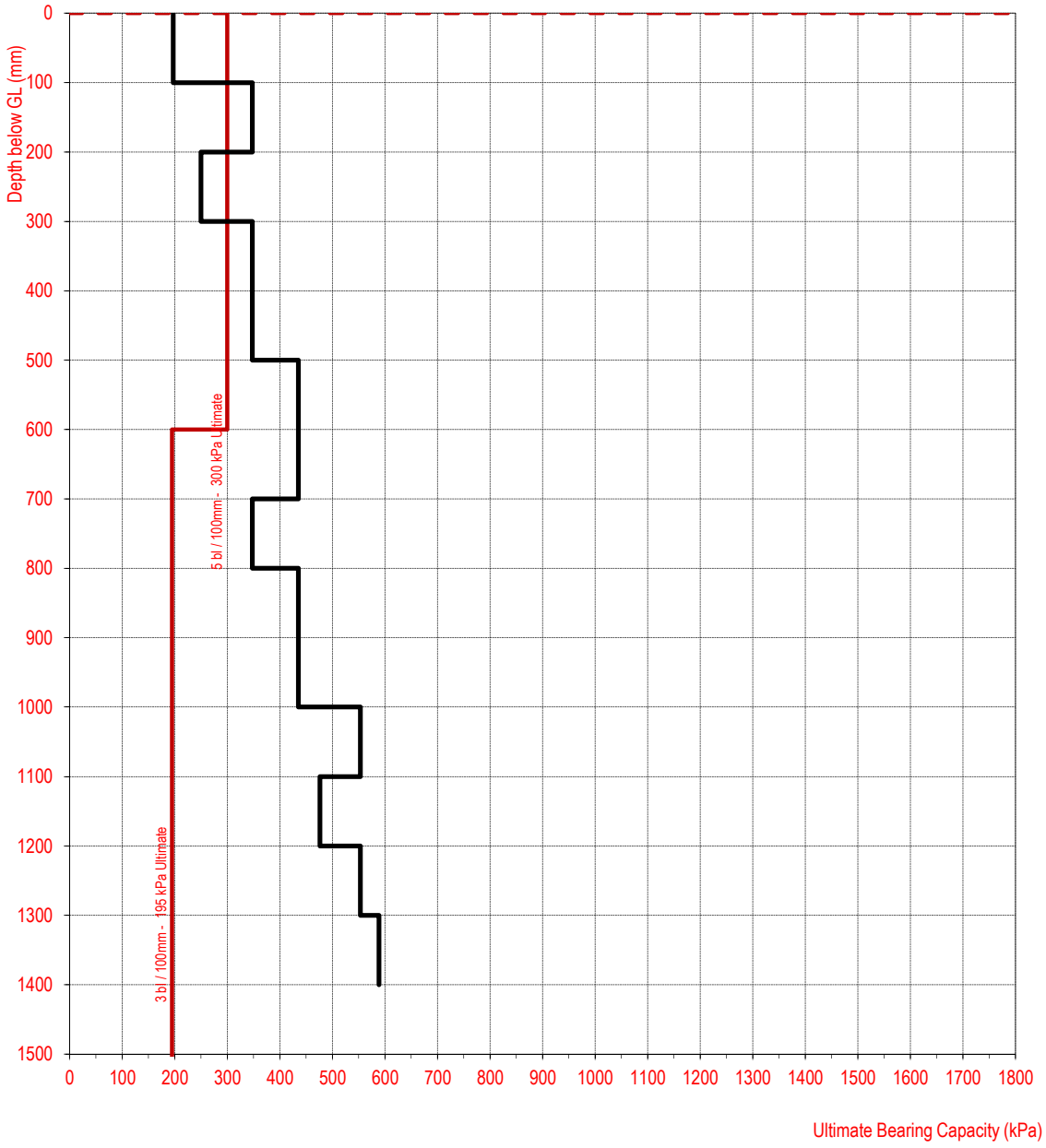
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	7	14	392
100-200	4	25	250
200-300	11	9	553
300-400	15	7	688
400-500	11	9	553
500-600	11	9	553
600-700	15	7	688
700-800	21	5	853
800-900	23	4	899
900-1000	15	7	688
1000-1100	27	4	980
1100-1200	21	5	853
1200-1300	16	6	718
1300-1400	14	7	656
1400-1500			

Test Date: **05-12-14**

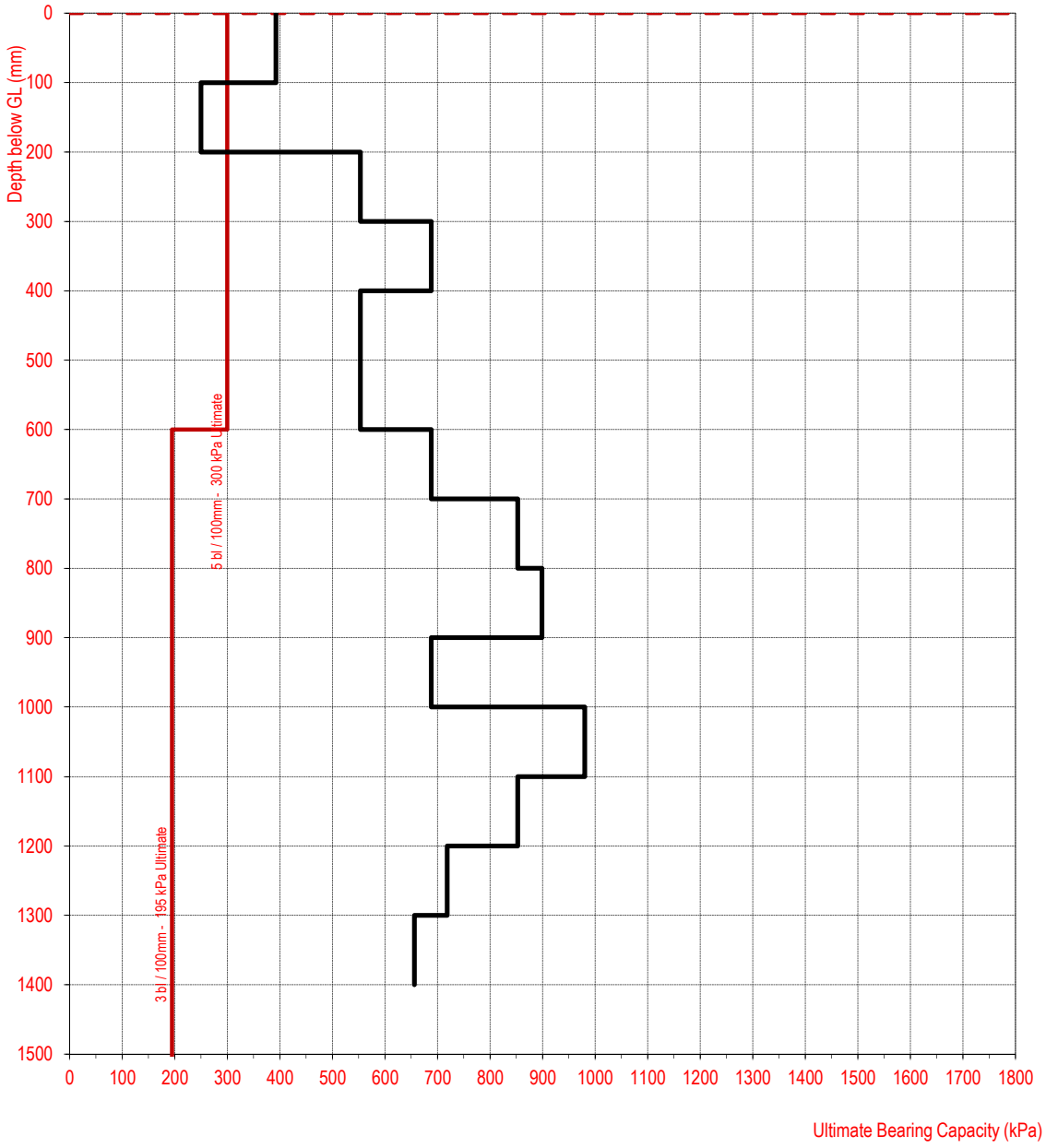
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**3**	**33**	**197**
100-200	**5**	**20**	**300**
200-300	**3**	**33**	**197**
300-400	**3**	**33**	**197**
400-500	**3**	**33**	**197**
500-600	**4**	**25**	**250**
600-700	**4**	**25**	**250**
700-800	**3**	**33**	**197**
800-900	**4**	**25**	**250**
900-1000	**4**	**25**	**250**
1000-1100	**4**	**25**	**250**
1100-1200	**4**	**25**	**250**
1200-1300	**4**	**25**	**250**
1300-1400	**6**	**17**	**347**
1400-1500			

Test Date: **05-12-14**

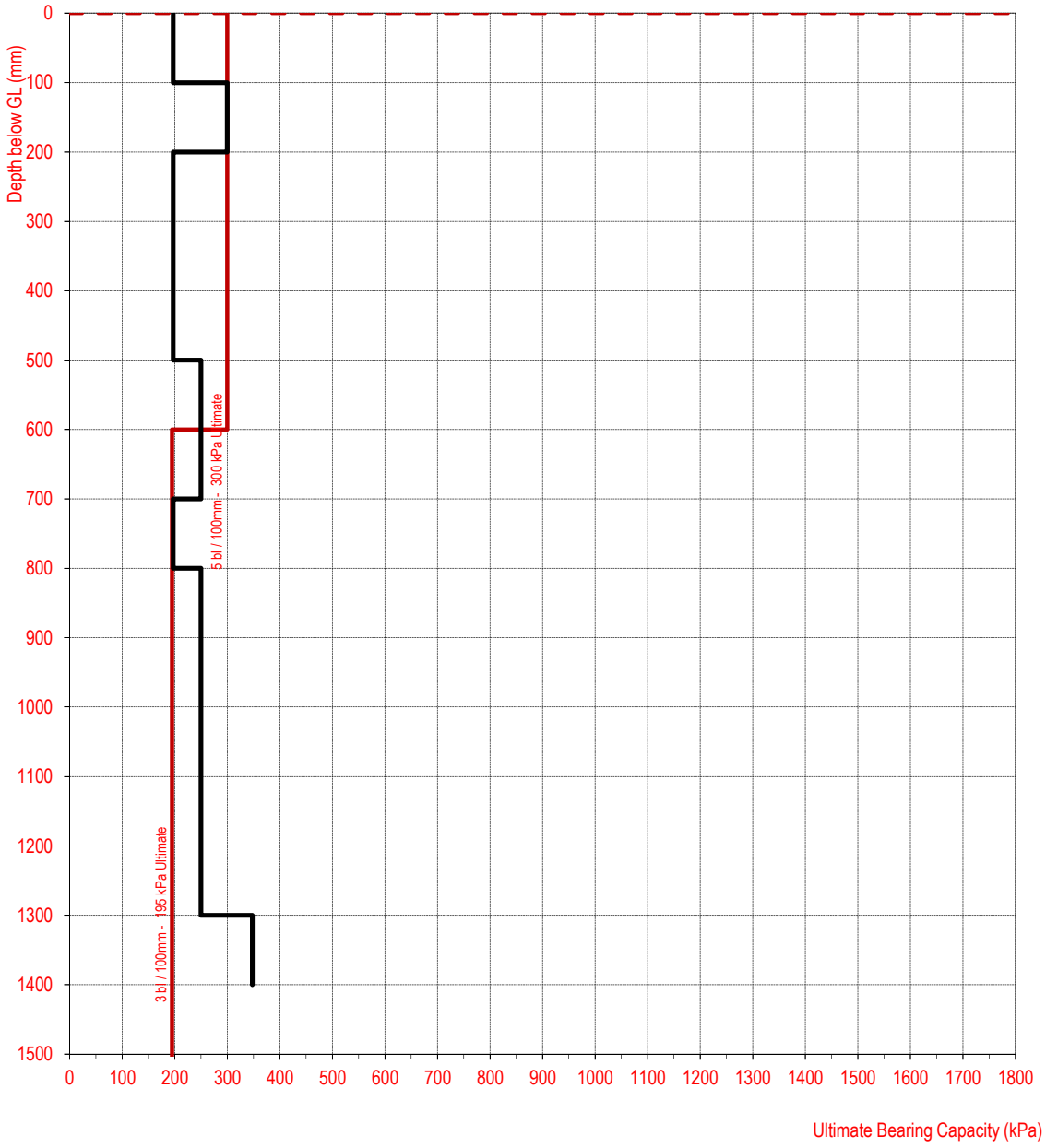
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	7	14	392
100-200	7	14	392
200-300	5	20	300
300-400	7	14	392
400-500	14	7	656
500-600	7	14	392
600-700	10	10	516
700-800	11	9	553
800-900	12	8	589
900-1000	20	5	828
1000-1100	16	6	718
1100-1200	14	7	656
1200-1300	10	10	516
1300-1400	11	9	553
1400-1500			

Test Date: **05-12-14**

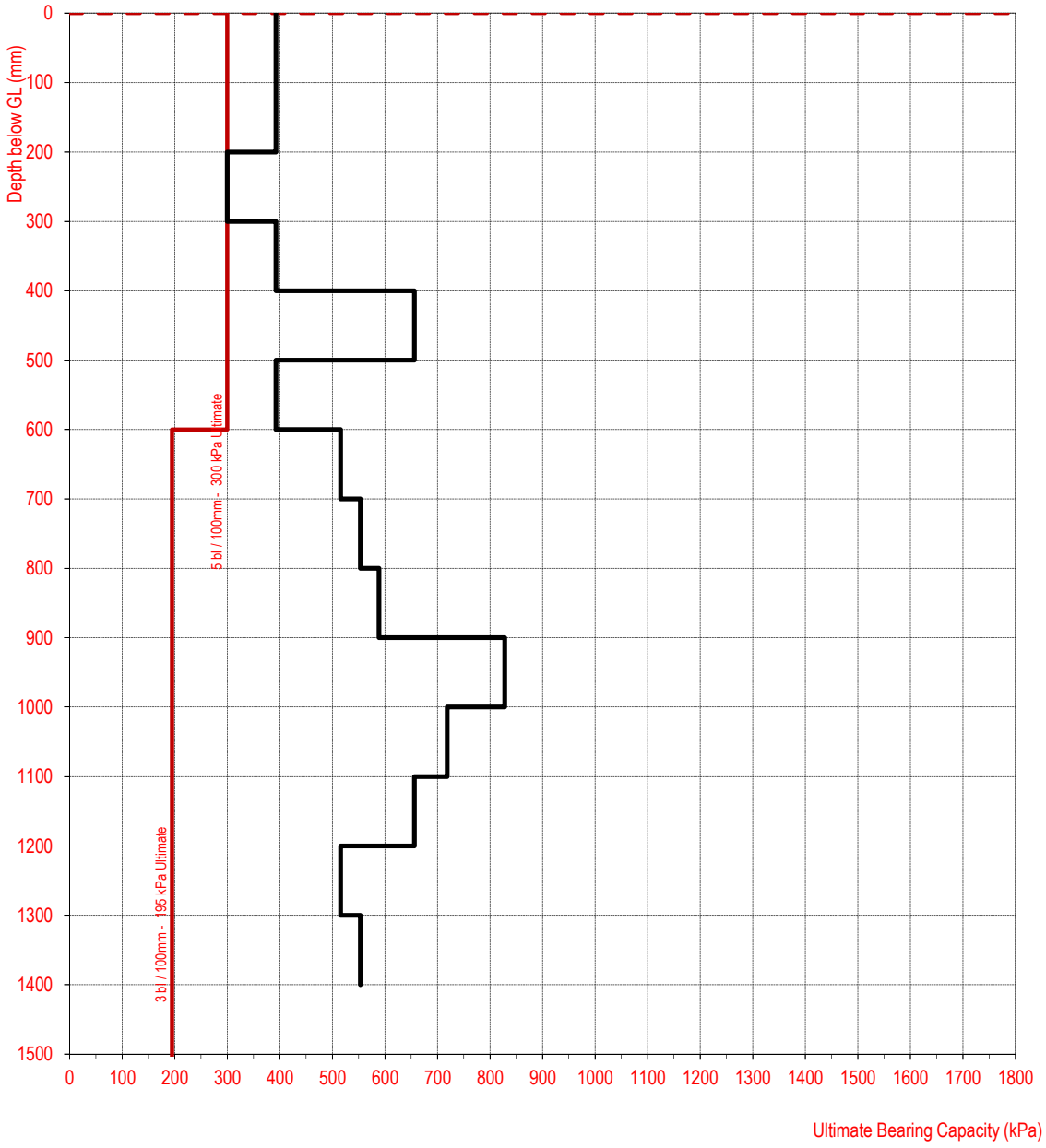
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	5	20	300
100-200	5	20	300
200-300	7	14	392
300-400	3	33	197
400-500	7	14	392
500-600	7	14	392
600-700	8	13	435
700-800	10	10	516
800-900	10	10	516
900-1000	9	11	476
1000-1100	10	10	516
1100-1200	15	7	688
1200-1300	15	7	688
1300-1400	18	6	775
1400-1500			

Test Date: **05-12-14**

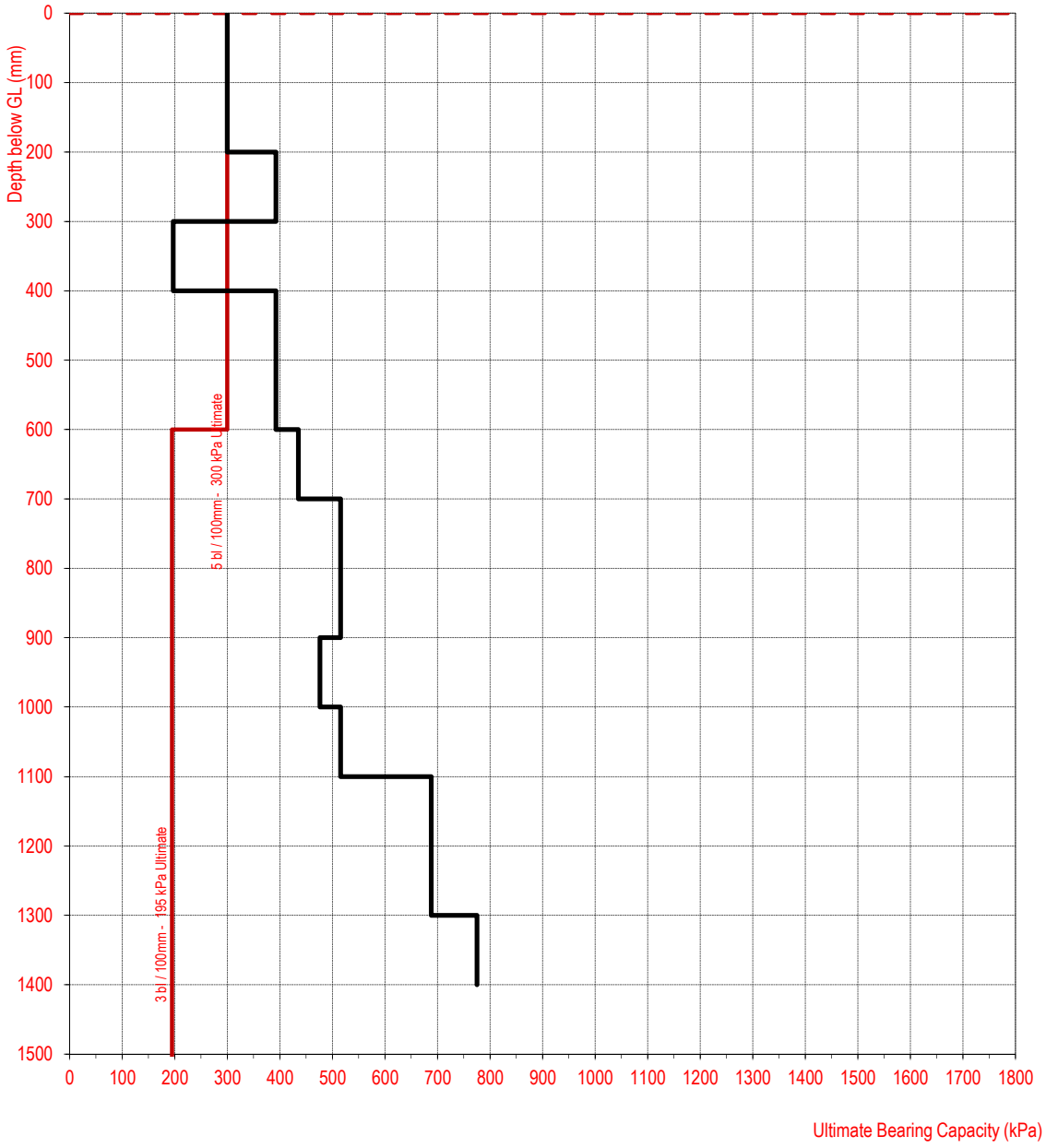
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **19**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	5	20	300
200-300	8	13	435
300-400	15	7	688
400-500	27	4	980
500-600	40	3	1162
600-700	39	3	1152
700-800	26	4	961
800-900	27	4	980
900-1000	16	6	718
1000-1100	25	4	941
1100-1200	22	5	876
1200-1300	35	3	1105
1300-1400	43	2	1189
1400-1500			

Test Date: **05-12-14**

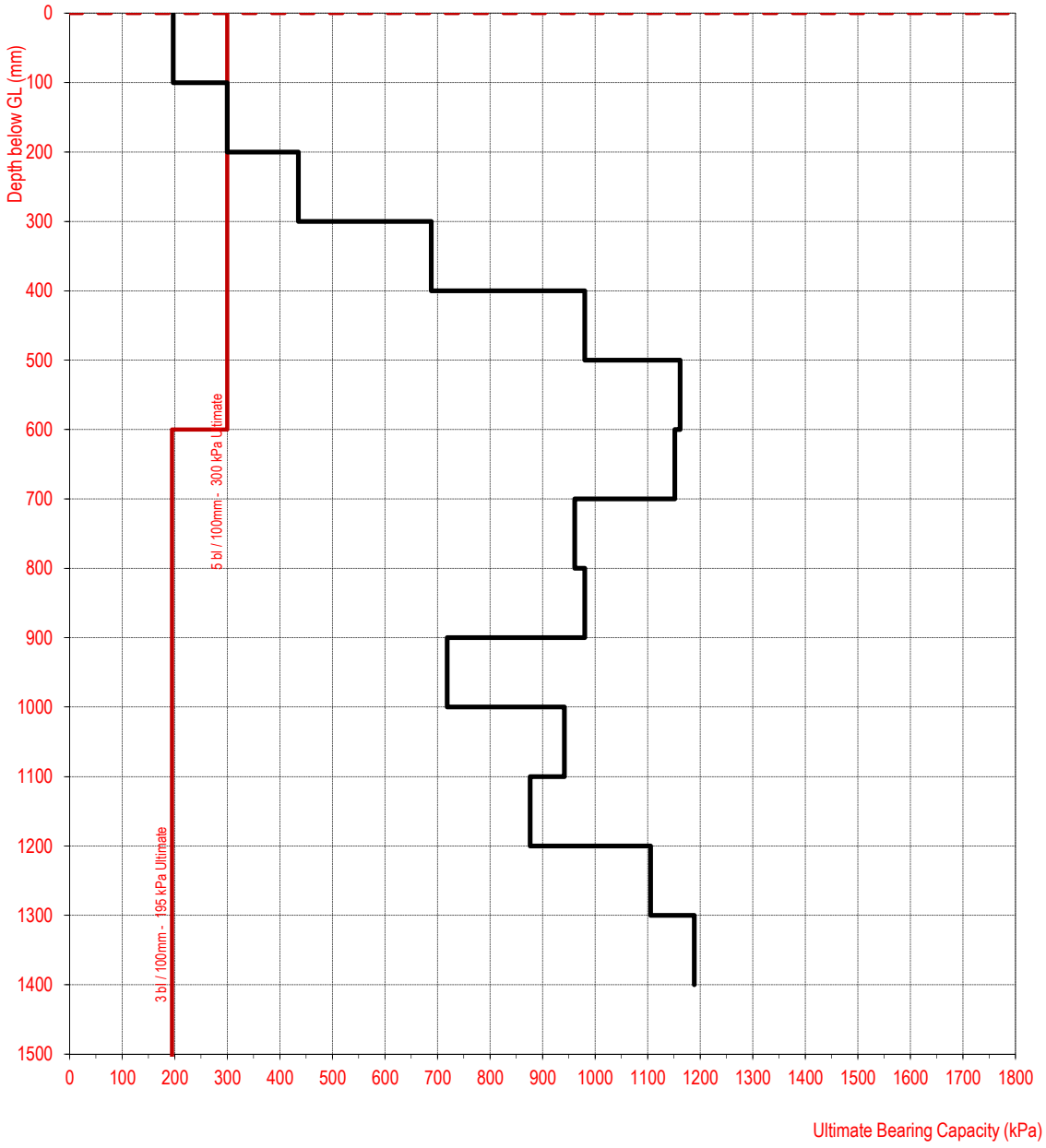
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP1**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	4	25	250
100-200	2	50	140
200-300	3	33	197
300-400	4	25	250
400-500	3	33	197
500-600	6	17	347
600-700	5	20	300
700-800	6	17	347
800-900	6	17	347
900-1000	7	14	392
1000-1100	13	8	623
1100-1200	13	8	623
1200-1300	12	8	589
1300-1400	18	6	775
1400-1500			

Test Date: **05-12-14**

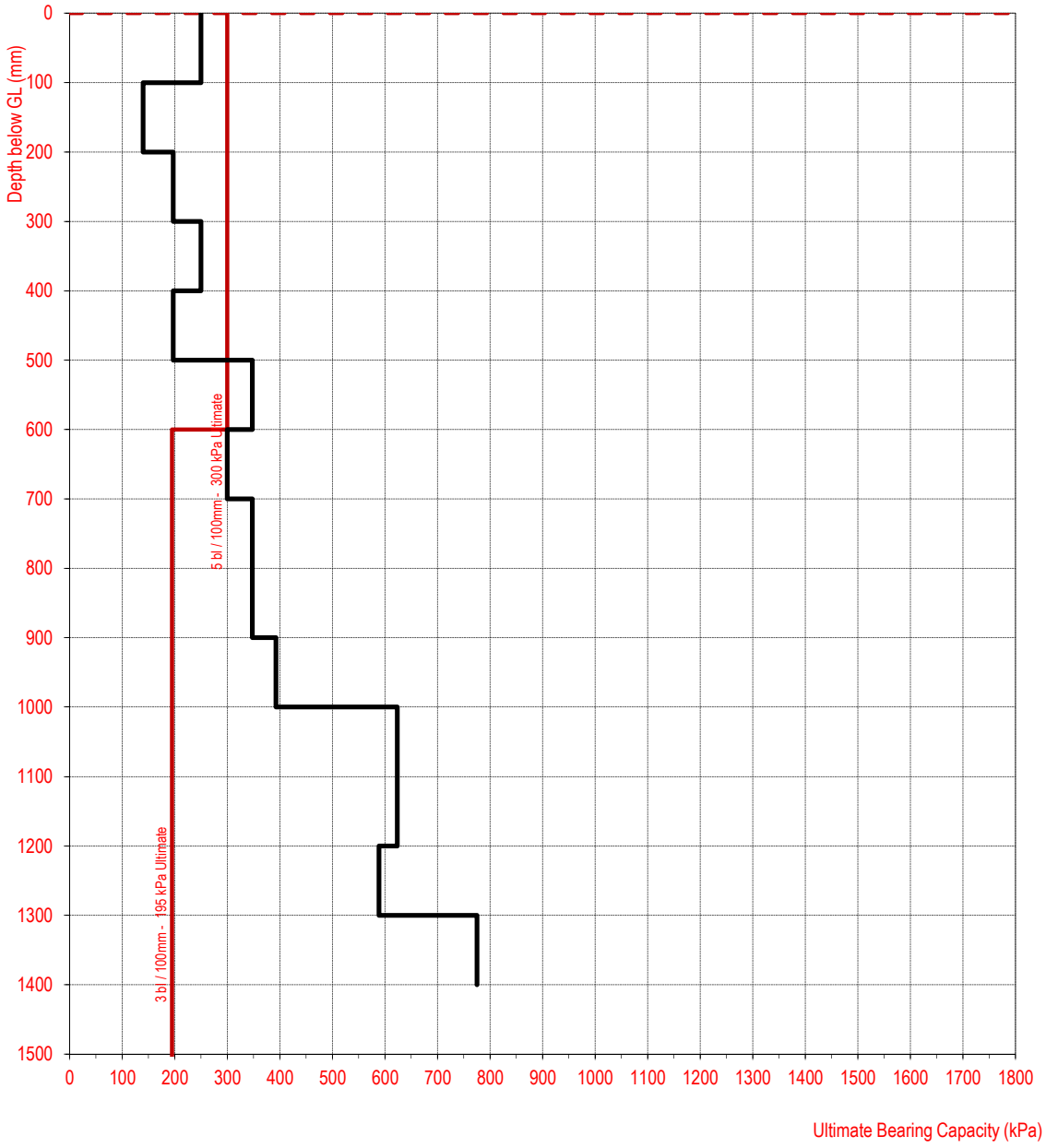
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP2**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**4**	**25**	**250**
100-200	**3**	**33**	**197**
200-300	**3**	**33**	**197**
300-400	**3**	**33**	**197**
400-500	**4**	**25**	**250**
500-600	**4**	**25**	**250**
600-700	**4**	**25**	**250**
700-800	**3**	**33**	**197**
800-900	**3**	**33**	**197**
900-1000	**3**	**33**	**197**
1000-1100	**4**	**25**	**250**
1100-1200	**3**	**33**	**197**
1200-1300	**4**	**25**	**250**
1300-1400	**4**	**25**	**250**
1400-1500			

Test Date: **05-12-14**

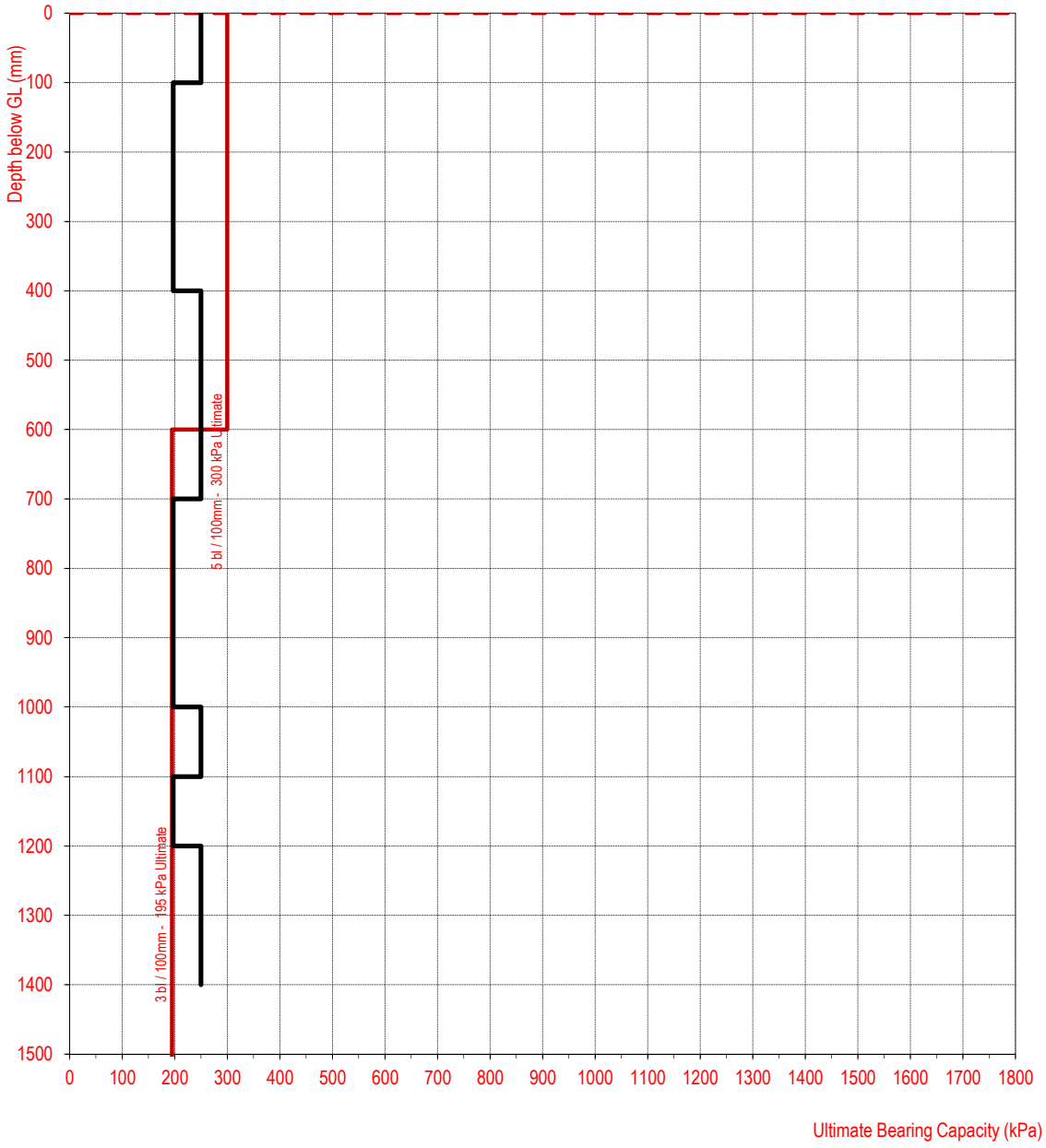
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP3**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	3	33	197
100-200	8	13	435
200-300	6	17	347
300-400	4	25	250
400-500	5	20	300
500-600	3	33	197
600-700	4	25	250
700-800	8	13	435
800-900	4	25	250
900-1000	5	20	300
1000-1100	4	25	250
1100-1200	4	25	250
1200-1300	7	14	392
1300-1400	5	20	300
1400-1500			

Test Date: **05-12-14**

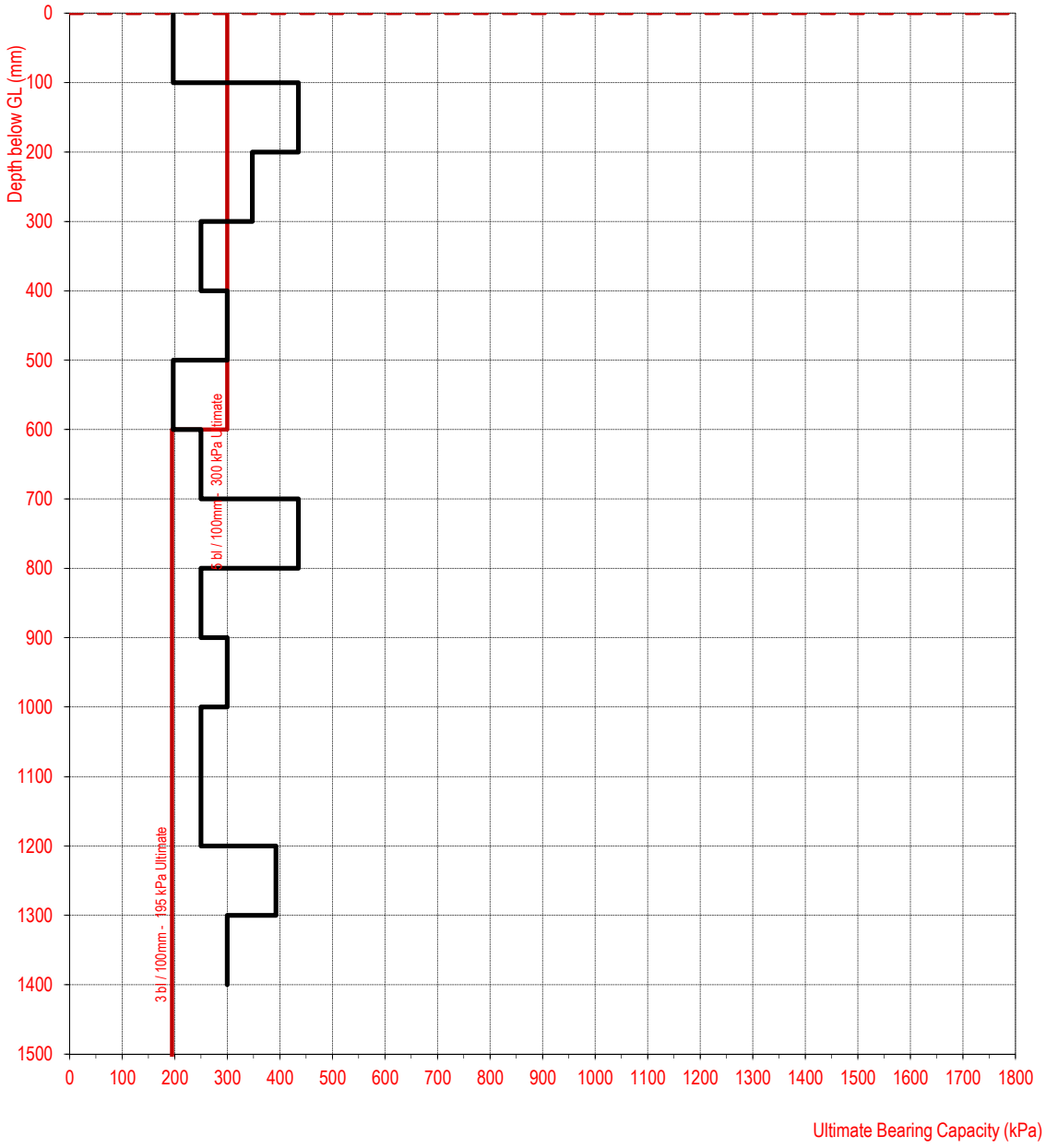
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP4**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	4	25	250
100-200	8	13	435
200-300	9	11	476
300-400	3	33	197
400-500	3	33	197
500-600	3	33	197
600-700	7	14	392
700-800	9	11	476
800-900	10	10	516
900-1000	5	20	300
1000-1100	5	20	300
1100-1200	9	11	476
1200-1300	11	9	553
1300-1400	6	17	347
1400-1500			

Test Date: **05-12-14**

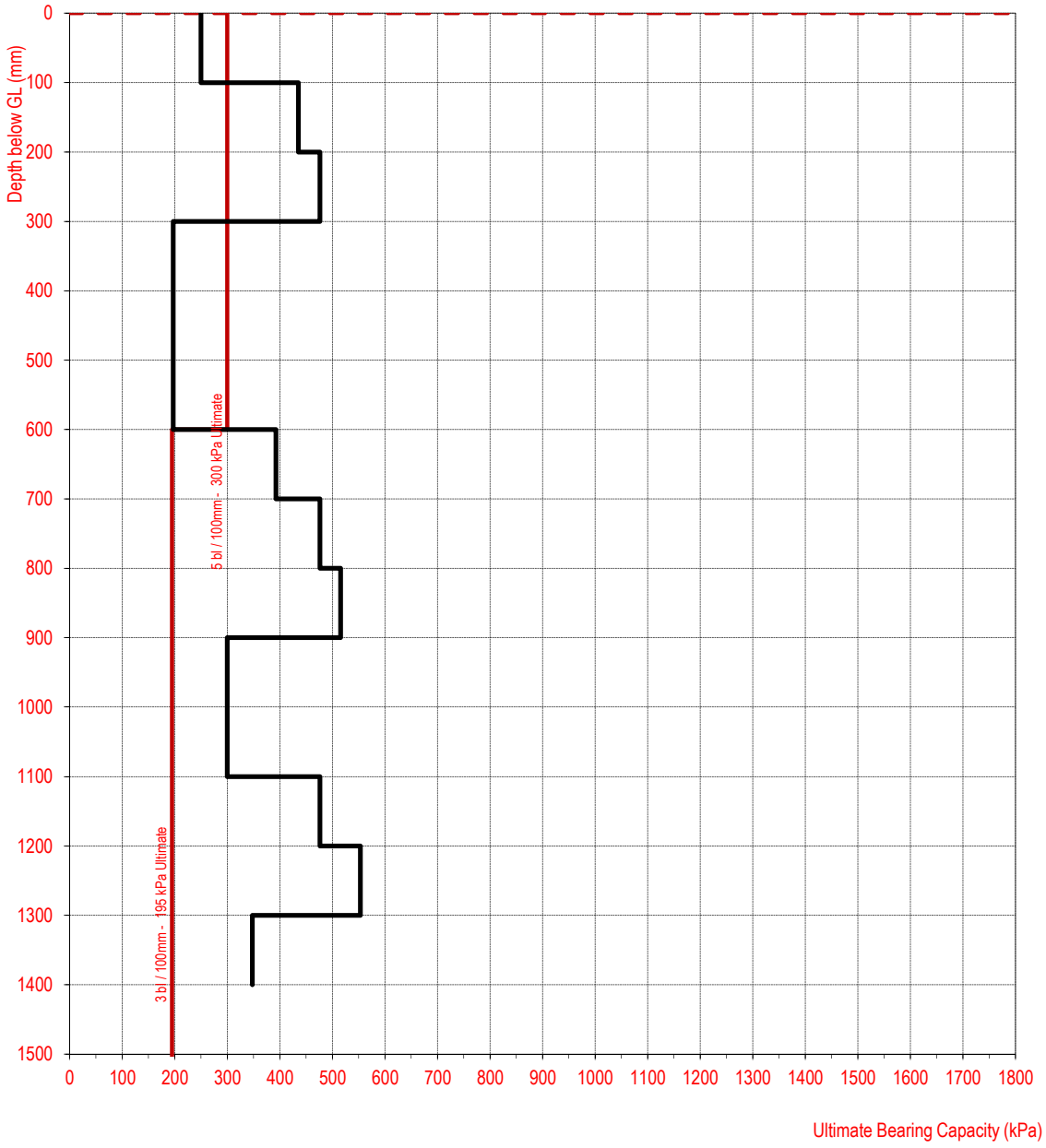
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP5**

Inferred Ultimate Bearing Capacity of ground



SCALAR PENETROMETER TEST

Depth	Blows	mm/Blow	Ultimate kPa
0-100	**6**	**17**	**347**
100-200	**4**	**25**	**250**
200-300	**7**	**14**	**392**
300-400	**6**	**17**	**347**
400-500	**5**	**20**	**300**
500-600	**13**	**8**	**623**
600-700	**8**	**13**	**435**
700-800	**8**	**13**	**435**
800-900	**16**	**6**	**718**
900-1000	**8**	**13**	**435**
1000-1100	**12**	**8**	**589**
1100-1200	**10**	**10**	**516**
1200-1300	**6**	**17**	**347**
1300-1400	**5**	**20**	**300**
1400-1500			

Test Date: **05-12-14**

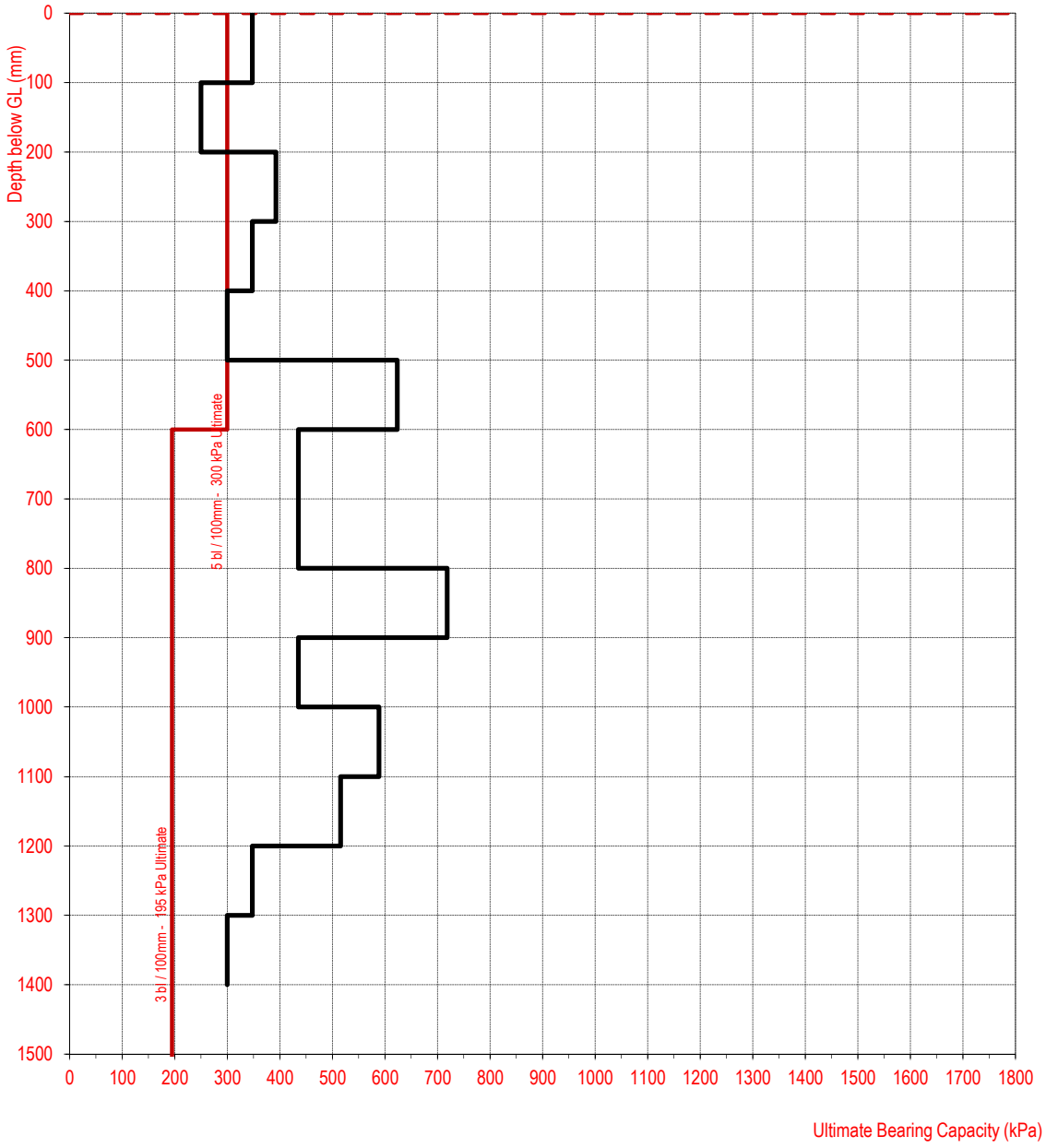
Client: **Utopia Lifestyles**

Address: **Galeo Subdivision**
Redvale Rd

Lot Num: **20**

Test Ref: **SP6**

Inferred Ultimate Bearing Capacity of ground



Appendix E. Geotechnical assessment of cut batters (Swanney Geotechnical & Civil Engineering Report 1704le01 dated 4 March 2015)

PO Box 828, NELSON

4 March 2015

Galeo Contracting Ltd
74 Wakefield Street,
Westport 7601

Stage Galeo Subdivision, Redwood Valley, Tasman

Assessment of the stability of building platform cut batters

Stage 1B, Lots 14, 16 – 20

Construction of the building platforms on Lots 14, 16 – 20 at the Galeo Subdivision has comprised forming a cut/fill platform on each lot benched into the existing rolling topography. Tasman Consulting Engineers Ltd has carried out the monitoring of the construction of the fills and will be providing the certification. Swanney Geotechnical and Civil Engineering have been requested to inspect the cut batters on each of the lots and provide any development recommendations considered warranted.

The site in entirely underlain by Moutere Gravel Formation, which comprises rounded gravels in a silt/clay matrix. The material is inherently stable, but can be prone to instability within the weathered top few metres in steeper/wetter areas. It generally stands well in appropriately battered cuts aside from minor fretting/erosion of the face.

The simplest approach to reduce the risk from potential instability of the cut batters is to introduce development conditions for each site where necessary. The potential risk to any future development has been assessed based on the height and batter angle of the cuts and the ground conditions exposed. Where it is considered that the risk to any future development from instability of the cut batter is above low, a set-back distance from the base of the cut or specific investigation and design of buildings/retaining works by a chartered engineer is recommended. The set-back distance provides a buffer, allowing space for any failed material to collect and be removed. Where it is stated below that no restrictions are necessary, this is only with regard to development in proximity to the cut batters in their current state and does not apply to other rules/regulations applying to development of the site.

Lot 14
Cut height approximately 3m from base of cut vertically to original ground line. Cut batter initially 40°-50°, reducing to ~30°. Sub-horizontal discontinuous thin grey clay seams within the in-situ mass noted at approximately half cut height. Unsure of the geological origin of this feature, although due to the shallow angle of inclination back into the slope its potential effect on the stability of the cut is considered to be minor. Recommend buildings be set back a minimum of 2.0m from the base of the cut batter or specific investigation and design of works by a chartered professional engineer.

Lot 16
Cut batter ~1.2m high and at ~50°. Minor clay seams as described on Lot 14 are present across the cut. No restrictions necessary.

Lot 17
Cut batter ~2m and at ~30°. No restrictions necessary.

Lot 18
Cut batter approximately 3m high at ~30°. Some loose fill along top edge of cut. Recommend buildings be set back a minimum of 2.0m from the base of the cut batter or specific investigation and design of works by a chartered professional engineer.

Lot 19
Cut batter approximately 1.5m at ~30°. No restrictions necessary.

Lot 20
Cut batter up to 3.5m high and at ~40°. Recommend buildings be set back a minimum of 2.0m from the base of the cut batter or specific investigation and design of works by a chartered professional engineer.

Please contact the undersigned if you have any queries regarding the extent or context of the above recommendations with regard to development of the building platforms.

Yours faithfully,

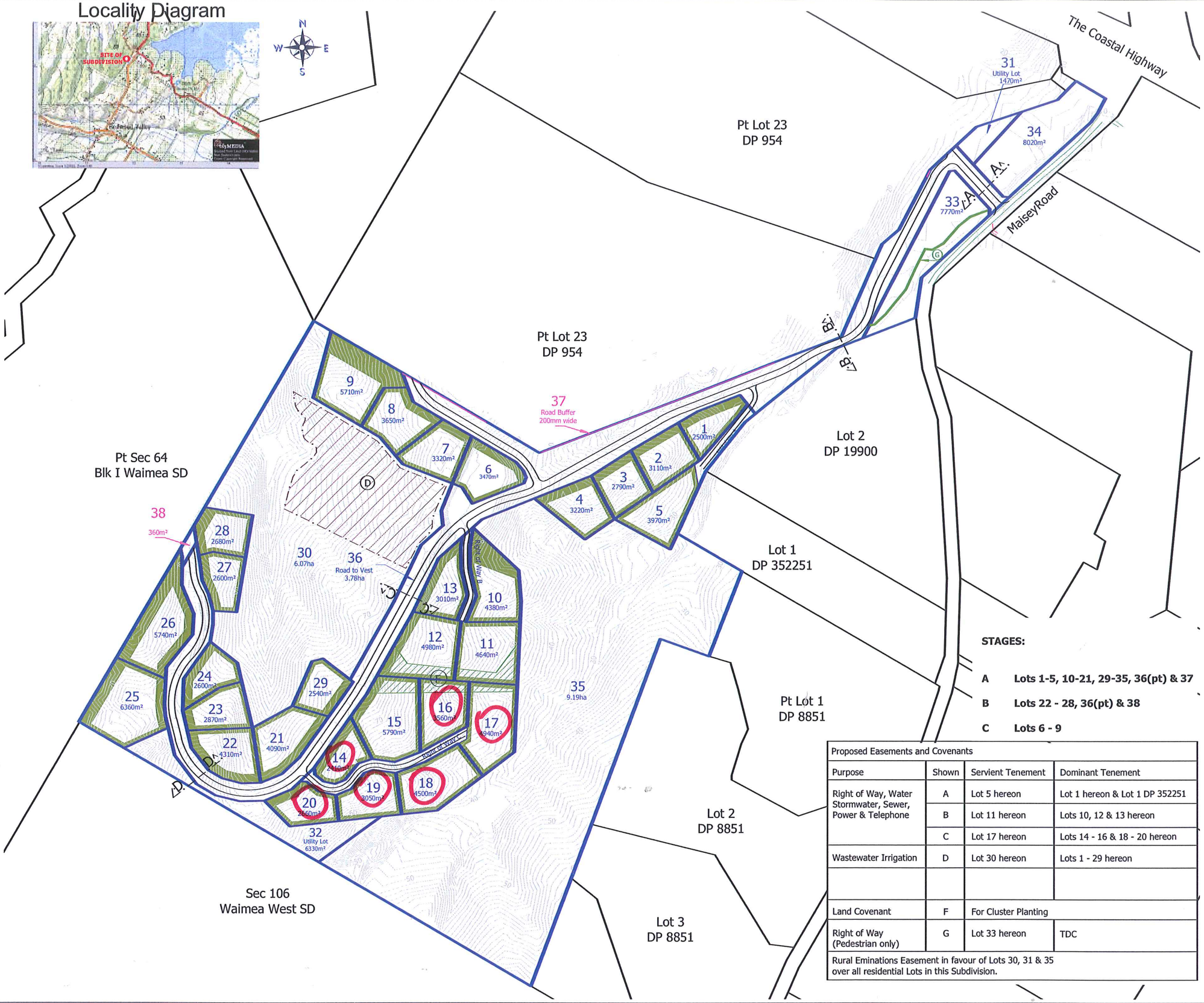
Jeff Swanney
CPEng, MIPENZ

Swanney Geotechnical and Civil Engineering
2 Bridge St,
PO Box 828,
Nelson

Appended: Subdivision site plan

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Locality Diagram



STAGES:

A	**Lots 1-5, 10-21, 29-35, 36(pt) & 37**
B	**Lots 22 - 28, 36(pt) & 38**
C	**Lots 6 - 9**

Proposed Easements and Covenants			
Purpose	Shown	Servient Tenement	Dominant Tenement
Right of Way, Water Stormwater, Sewer, Power & Telephone	A	Lot 5 hereon	Lot 1 hereon & Lot 1 DP 352251
	B	Lot 11 hereon	Lots 10, 12 & 13 hereon
	C	Lot 17 hereon	Lots 14 - 16 & 18 - 20 hereon
Wastewater Irrigation	D	Lot 30 hereon	Lots 1 - 29 hereon
Land Covenant	F	For Cluster Planting	
Right of Way (Pedestrian only)	G	Lot 33 hereon	TDC
Rural Eminations Easement in favour of Lots 30, 31 & 35 over all residential Lots in this Subdivision.			

Notes:

Warning

This Plan has been prepared for the purpose of a resource consent application only. It is not a precise survey plan. As areas and dimensions are likely to vary upon survey it should not be attached to sales & purchase agreements without an appropriate condition to cover such variations.

This Subdivision was approved as a.....
Activity on the .....day of.....
20..... subject to the conditions noted in the file.

.....
SUBDIVISION OFFICER

AMALGAMATION CONDITIONS:

That Lots 11 & 35 hereon be held together and one Certificate of Title be issued.

That Lots 29 & 30 hereon be held together and one Certificate of Title be issued.

Key:
Building Exclusion Area

Comprised in : CT NL

Applicants:
GALEO Estates

CAD and Production by:

COMPUTER AIDED DRAUGHTING
LAND GRAPHICS
ASSET MANAGEMENT SYSTEMS

CAD Solutions

Land Information House
16 Paru Paru Road
PO Box 913 Nelson
Phone: 03 - 545 6888
Fax: 03 - 548 4427
E-mail: cadsolutions@staigsmith.co.nz

Concept Developed by:

NELSON OFFICE

Land Information House
16 Paru Paru Road
PO Box 913 Nelson

Ph: 03 548 4422
Fax: 03 548 4427
e-mail: enquiries@staigsmith.co.nz

STAIG & SMITH LIMITED
RESOURCE MANAGEMENT
SURVEYING PLANNING ENGINEERING

Job Title:

GALEO Developments Ltd.
Maisey Road
Redwood Valley

Drawing Title:

OVERLAY 6
Subdivision Layout

Plan Information:

Scale: @ A3= 1: 4000 (0m 50m 100m 150m)		
Job No. 7958	*CAD File No.* 7958-05	*Sheet* 1 of 1
Issue No. 2	*Drawn* M.Graf	*Date* 12/12/2005

Note:
Adobe PDF Prints can be scale distorted tue to different printer margemn

TASMAN CONSULTING ENGINEERS
CIVIL & STRUCTURAL

www.tcel.co.nz

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 2

Allied Concrete SuperSlab

Raft Floor

Building Code Clause(s) **B1 (REFER ATTACHED LETTER FOR DURABILITY STATEMENT)**

PRODUCER STATEMENT – PS1 – DESIGN

ISSUED BY: HFC Structures Ltd
(Design Firm)

TO: Tangata Homes
(Owner/Developer)

TO BE SUPPLIED TO: Tasman District Council
(Building Consent Authority)

IN RESPECT OF: TC1 Superslab
(Description of Building Work)

AT: 105 Redvale Road, Galeo, Tasman
(Address)

Town/City: Tasman
Lot: 14 DP: 476117

We have been engaged by the owner/developer referred to above to provide: **Structural engineering services as per the attached calculations**
in respect of clause(s) : **B1** of the building code for **Part only** (as specified in the attachment to this statement), of the the proposed building work.

The design carried out by us has been prepared in accordance with: Complicance Documents issued by the MBIE **B1-VM1/AS1, VM4**

and as per soil report by: **TCE Ltd ref 14118 and 20308 dated 26/03/21**
Alternative solution as per the attached schedule:

The proposed building work covered by this producer statement is described on the drawings titled: 105 Redvale Road, Galeo, Tasman
as per HFC job number 21798 and drawings together with the specification, and other documents attached to this statement
On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions as per S99 notes 1-3 and soil report as per reference above if applicable
(ii) All proprietary products meeting their performance specification requirements;
I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and
other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code
and that b), the persons who have undertaken the design have the necessary competency to do so.

I also recommend the following level of construction monitoring/observation:

CM1 ☐ CM2 ☐ **CM3** ☑ CM4 ☐ CM5 ☐ (Engineering Categories) or as per agreement with owner/developer (Architectural)

I **ROBERT CLARRY** am CPEng **1018679**
(Name of Design Professional)

I am a Member of : **Engineering New Zealand** and hold the following qualifications: **BE (Hons), CMEngNZ, CPEng**

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.

SIGNED BY **ROBERT CLARRY** ON BEHALF OF **HFC STRUCTURES LTD**

Date: 9/12/2021 .....
(signature)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited d to the sum of $200,000.*

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACE NEW ZEALAND AND ENGINEERING NEW ZEALAND

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional engineers New Zealand (now Engineering New Zealand), ACE New Zealand in consultation with the Building Officials Institute of New Zealand. The original suit of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry. The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 Design Review Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 20112

PS4 Construction Review Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence based register as a Chartered Professional Engineer (CPEng).

Membership of a professional body, such as Engineering New Zealand (formerly IPENZ) provides additional assurance of the designer's standing within the profession. If the design firm is a member of ACE New Zealand, this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

***Professional Indemnity Insurance**

As part of membership requirements, ACE New Zealand requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers[3]). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the projectconcerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013

2 NZIA Standard Conditions of ContractSCC 2011

Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/Engineering New Zealand 2004)

4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org

9/12/2021
Attention: Tasman District Council

HFC Job reference 21798

PS1 LIMITATIONS WITH REGARD TO B2 DURABILITY

To whom it may concern,

B2 compliance in respect TC1 Superslab at Lot: 14, DP: 476117, 105 Redvale Road, Galeo, Tasman

You have requested a Producer Statement/other means of compliance for Construction Review for Clause B2 of the

The purpose of this letter is to confirm that direct construction monitoring by HFC Structures Ltd or as nominated in inspection schedule appended, in relation to Clause B2 (Durability) of the Building Code for the above project, has been limited in that material protection or treatment is typically carried out by specialist suppliers and requires specific quality assurance by the suppliers. However, we can confirm the specifically designed structural elements that were included in the design documentation prepared by the HFC Structures Ltd comply with the applicable verification methods:

Material:	Means of compliance:	Details:
Reinforced Concrete	B2/AS1	Concrete cover to reinforcement bars has been selected in accordance with NZS3101, Part 1, Section 3
Structural Timber	B2/AS1	Timber treatment has been selected in accordance with Table 1A of B2/AS1
Mild Steel Structure	Alternative Solution	Protection for mild steel has been specified in accordance with SNZ TS 3404 - Durability requirements for steel structures and components, and AS/NZS2312 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings. This guide works on a time to first maintenance basis and assumes on-going maintenance. Refer to the attached maintenance plan (optional but recommended)
Other		

Weather tightness and waterproofing details and materials are specifically excluded from our PS1
The Producer Statements issued should not be relied on to establish compliance with the building code clauses E1, E2, E3. Weathertightness and waterproofing design, materials, proprietary products, construction and/or inspections are specifically excluded from these producer statements

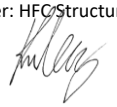
The durability of structural building work is reliant on protection from external water and moisture being achieved and maintained throughout the life of the building or structure. Protection against external water and moisture is dependent on appropriate detailing, materials, proprietary products and construction practices which HFC does not design/or inspect for compliance with the requirements of the building code.

HFC accepts no liability in contract, tort, or otherwise (including negligence) for the failure of the building or structure to meet or perform to the requirements of the Building Act 2004 (or any subsequent Act) and any regulations made there under (or any amendment or substitution thereof) in relation to:
External water and/or moisture
The loss of structural durability or strength to the building or structure as a result of external moisture entering the building or structure, or the effects thereof.

This schedule of ongoing inspection and maintenance of structural elements shall be included with the O&M manuals and provided to the Owner/Body Corporate and building managers.

Inspection/Maintenance timeframe and item	
(a) Half-yearly	Wash down all exposed steelwork that is not in a fully interior environment including: • Veranda steelwork • Steel carpark structure (beams, columns, braces etc) • Deck and balcony steelwork • Exposed façade steelwork, both primary and secondary structure • Sub-ground floor mild-steel structures such as beams.
(b) 5-yearly	Inspect and repair sealant that encloses structural mild-steel components and/or timber with mild-steel fixings.
(c) 10-yearly	Check exposed timber fixings for corrosion, repair as required.
	Inspect/replace sealant that encloses structural mild-steel components and/or timber with mild-steel fixings. This will typically include sealants around the perimeter of precast panels. **Note that 10 years is the expected useful life for many sealants.**
	Check all exposed steelwork that is not in a fully interior environment for signs of corrosion. Repair protective coatings as required.
(d) 25-yearly	Inspect samples of structural steel that is hidden from view but not enclosed within a vapour barrier, and repair protective coatings as necessary. A typical example is a veranda with built-in steelwork. (Such steelwork should typically have duplex protective coatings). Inspection may typically require removal of claddings and/or the drilling of holes for borescope access. Repair as required.
	Inspect all exposed, external timber. Repair as required.
	Inspect all exposed, external reinforced concrete for signs of spalling. Repair as required.
Following seismic shaking > SLS1 event	Inspections and repair as per b), c) and d) above.

Yours faithfully
per: HFC Structures Ltd



Robert Clarry
BE (Hons), CMEngNZ, CPEng

DRAFT

HFC Inspection schedule for: **Tasman District Council**

Site address: Lot: 14, DP: 476117, 105 Redvale Road, Galeo, Tasman
RE: Specific Engineering inspections to enable PS4 as per HFC job reference number : **21798**

The inspections required are also dependant on the conditions of the building consent as per local building authority requirements. We would advise checking with the council when in doubt.

HFC recommend the following minimum structural inspections be carried out by a chartered Professional engineer (or nominated representative) to enable the PS4 to be issued - Producer statement (PS4 CM3) of construction review

Inspections to be completed by :	TCE Ltd (or as engaged by the developer)	Local Charted Structural engineer as nominated by the client
Site scrape - Inspection to confirm topsoil removal and Subgrade/strength and/or sub/base compaction as per the geotechnical	☑	☐
Engineered fill or Gravel Raft - Site geotextile and/or geogrid as required by design drawings and certify compaction as per design and geotechnical report	☐	☐
Foundation Prepour inspections : Slab and isolated pads (As per HFC drawings only)		☑

SED Elements - (Refer Design PS1)	☐
Prepour block wall inspection	☐
Site SED beams and columns and associated connection details	☐
SED bracing - SED floor diaphragm, strap bracing	☐
Portal frames - Site portals and associated detailing	☐
Other - Refer PS1 eg. SED stairs or handrails	☐

Notes
1) Inspections may be combined or added at the discretion of the CPEng engineer as per specific job conditions to enable a PS4 to be issued. The number of inspections required are dependent on the construction programme, the complexity of the job and experience of the contractor.

2) It is the responsibility of the owner's agent (normally the contractor) to check the conditions of the consent and arrange the required inspections to enable a PS4 to be issued. Please provide 48 hour notice for the required inspection

3) Issuing of a PS4 Producer Statement – Construction Review is dependent on the satisfactory completion of the specified works, and only issued for the work which has been inspected, and found to be in compliance with the structural documentation. We may ask contractor for PS3 Producer Statement – Construction prior to the issue of a

4) For engineering enquiries relating to this project please contact the office direct on
09 3671070 quoting reference #: **21798**

Yours faithfully
per: HFC Structures Ltd



Robert Clarry
BE (Hons), CMEngNZ, CPEng

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 30C or 45, Building Act 2004

Please fill in the form as fully and correctly as possible.
If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING		
Street address:	105 Redvale Road, Galeo	
Suburb:	Tasman	
Town/City:	Tasman District	Postcode:

THE OWNER(S)		
Name(s):	Tangata Homes	
Mailing address:		
Suburb:	PO Box/Private Bag:	
Town/City:		Postcode:
Phone number:	Email address:	

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies ☑

☐	**sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design work myself – no other person will be providing any additional memoranda for the project
☐	**lead** designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and **no other** person will be providing any additional memoranda for the project
☐	**lead** designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the **other** designers will provide their own memorandum relating to their specific RBW design
☑	**specialist** designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I Robert Clarry ~~carried out~~ / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ☑ if included. Cross ☒ if excluded	If appropriate, provide details of the RBW	Tick ☑ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
~~All~~ RBW design work relating to B1 ☑	As per HFC Calculations & PS1 only	☐ Carried out ☑ Supervised	As referenced in HFC PS1 only. Job number: 21798
Foundations and subfloor framing ☑	Foundation Design as per HFC PS1	☐ Carried out ☑ Supervised	As referenced in HFC PS1 only. Job number: 21798

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ☑ if included. Cross ☒ if excluded	If appropriate, provide details of the RBW	Tick ☑ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Walls ☐	N/A	☐ Carried out ☐ Supervised	N/A
Roof ☐	N/A	☐ Carried out ☐ Supervised	N/A
Columns and beams ☐	N/A	☐ Carried out ☐ Supervised	N/A
Bracing ☐		☐ Carried out ☑ Supervised	
Other ☐	N/A	☐ Carried out ☐ Supervised	N/A

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
~~All RBW design work relating to E2~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Damp proofing~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Roof cladding or roof cladding system~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Ventilation system (for example, subfloor or cavity)~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Wall cladding or wall cladding system~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Waterproofing~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A
~~Other~~ ☐	N/A	☐ Carried out ☐ Supervised	N/A

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
FIRE SAFETY SYSTEMS: C1 - C6			
~~Emergency warning systems~~ ~~Evacuation and fire service operation systems~~ ☐ ~~Suppression or control systems~~ ~~Other~~	N/A	☐ Carried out ☐ Supervised	N/A

Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the Building Code are required. ☐ Yes ☑ No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
List relevant clause numbers of building code	Specify nature of waiver or modification of building code required

ISSUED BY

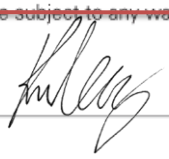
Name and contact details of the licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work.

Name:	Robert Clarry	LBP or Registration number:	1018679
The practitioner is a:	☐ Design LBP ☐ Registered architect ☑ Chartered professional engineer		
Design Entity or Company (optional):	HFC Structures Ltd		
Mailing address (if different from below):	P.O Box 109 106, Newmarket 1149		
Street address/Registered office:	Level 2, 19 Morgan Street		
Suburb:	Newmarket	Town/City:	Auckland
PO Box/Private Bag:		Postcode:	1149
Phone number:		Mobile:	+64 21 523 554
After hours:		Fax:	
Email address:	Robert@hfc.co.nz	Website:	www.hfc.co.nz

DECLARATION

I Robert Clarry LBP, state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code, or
- ~~Complies with the building code subject to any waiver or modification of the building code recorded on this form~~

Signature: 

Date: 9/12/2021

TC1 SUPERSLAB

FOR:

TANGATA HOMES

AT

105 REDVALE ROAD, GALEO,

TASMAN

(LOT 14, DP 476117)

JOB OVERVIEW

CLIENT NAME: Tangata Homes

ADDRESS: 105 Redvale Road, Galeo, Tasman

LOT: 14

DP: 476117

COUNCIL: Tasman District Council

DWG TITLE: TC1 Superslab

DRAWING NO.S: S99 -> S104

DESIGN PRINCIPAL CHARACTERISTICS

ROOF CLADDING:	LONGRUN	=	**0.5 kPa**	ROOF TRIBUTARY WIDTH	=	**4.10 m**
STOREYS:	SINGLE					
EXTERIOR WALLS:	WEATHERBOARD					

GEOTECHNICAL REQUIREMENTS

ULITMATE BEARING CAPACITY:	300 kPa	**LIQUEFACTION CATEGORY:**	TC1(LOW RISK)
DEPENDABLE BEARING CAPACITY:	150 kPa	**EXPANSIVE SOILS CLASSIFICAITON:**	P or A (AS 2870)
ALLOWABLE BEARING CAPACITY:	100 kPa	**DIFFERENTIAL MOUND MOVEMENT (0.7Ys):**	18 mm

SLAB DESIGN

1) General Living Areas

DEAD LOADS (G)	Slab	=	2.13 kPa	
	SDL	=	0.50 kPa	
	Total	=	**2.63 kPa**	
LIVE LOADS (Q)	Domestic (House)	=	**1.50 kPa**	
	-> 1.2G + 1.5Q	=	**5.40 kPa**	
Two way spanning slab :	Lx = L y =		1.10 m	
	Mult =	=	0.41 kNm per metre	
SE62 Mesh:	As	=	145 mm² per metre	
	fy	=	500 MPa	
	d	=	36 mm	
	a	=	3.41 mm	
	ϕMn	=	**2.1 kNm**	**OK**
Check punching shear	V* (1.5 x P)	=	19.50 kN	
	ϕVc	=	**28.46 kN**	**OK**
Min. shrinkage reinforcement		=	119 mm² per metre	
SE62		=	**145 mm²** per metre	**OK**

2) Garage Areas

DEAD (G)	Total	=	2.63 kPa	
LIVE (Q)	Garage	=	2.50 kPa	
	Point load	=	13.00 kN	
	-> 1.2G + 1.5Q	=	6.90 kPa	
Two way spanning slab :	Lx = L y =		1.10 m	
Mult =		=	**0.5 kNm**	**OK**
Mult =		=	**1.6 kNm**	**OK**

BEARING UNDER SLAB

Allowable bearing pressure	=	100 kPa	
Dependable bearing pressure	=	150 kPa	

Assume loads can be transfgerred to subgrade in 2 Ways:

Slab load transmitted through polystyrene blocks	=	5.13 kPa	
OK by inspection			

Total contact area:

Check ultimate beaing under a 1200 x 1200 panel (bearing area = 0.23 m²)

Total slab weight including ribs = 2.125 + 0.88	=	3.0 kPa	
SDL	=	0.50 kPa	
G + 0.4Q = 3.003 + 0.5 + 0.4 x 2.5	=	4.5 kPa	
Pressure under rib	=	**28.2 kPa**	**OK**
1.2G + 1.5Q = 1.2 x (3.003 + 0.5) + 1.5 x 2.5	=	8.0 kPa	
Pressure under rib	=	**49.8 kPa**	**OK**

Settlement Soil Pressures:

Use long term live load reduction factor	=	0.4	
Living areas:	=	22.6 kPa	
Residential Garage:	=	25.1 kPa	
		7.2 kPa	
Max bearing load for settlement	=	**32 kPa**	

PERIMETER FOOTINGS

Structure Data

No. of storeys = 1

		Trib Width/Height	G Line Load	Q Line Load
ROOF CLADDING	LONGRUN	3.50 m	2.13 kN/m	1.0 kN/m
ROOF PITCH (WEIGHT MODIFIED)	30 degrees			
LEVEL 1 WALL CLADDING	WEATHERBOARD	2.45 m	1.10 kN/m	
SLAB S/W AND SDL		0.60 m	2.1 kN/m	0.9 kN/m
FOOTING S/W			2.3 kN/m	
DEEPEND FOOTING	0.00 m		0.0 kN/m	
Total Unfactored Line Loads			7.6 kN/m	1.9 kN/m

Footing width = 0.300 m

Wult (G + 0.4Q)	= 8.4 kN/m	=	28 kPa	**BEARING OK**
Wult (1.35G)	= 10.3 kN/m	=	34 kPa	**BEARING OK**
Wult (1.2G + 1.5Q)	= 12.0 kN/m	=	40 kPa	**BEARING OK**

Sliding Check

Soil Friction Angle = 30°
Coefficient of friction = 0.8 x tan(Ø') = 0.46

SEISMIC COEFFICENT (D soils) T = 0, μ =1.0
SLS = **0.203**
FRICTIONAL RESISTANCE LARGER THAN SLIDING FORCE, THEREFORE SLIDING OK BY INSPECTION
ULS = **0.810**
PIPE PENETRATIONS TO BE DETAILED IN ACCORDANCE WITH MBIE GUIDANCE REPORT PART A, FIG 5.14

Settlement Soil Pressures:

Use long term live load reduction factor for roof = 0.4

Footing width = 0.300 m

Max bearing load for settlement = **28 kPa**

Summary:

f'c	=	25 MPa		
Top perimeter steel	=	HD12	=	113 mm²
Bottom perimeter steel	=	2 x HD12	=	226 mm²
Mesh	=	SE62	=	145 mm² per metre
Hockey stick bar	=	12 mm	=	113 mm²

Soil classification	=	P or A (AS 2870)
Site Y_s	=	25 mm (ULS)
Pod size	=	0.220 m
Topping	=	0.085 m
20% CRACKING MOMENT REQUIREMENT TO AS 2870 CLAUSE 4.4(i) IS…	=	**OK**
Moment Capacity of Rib check for loss of support case	=	**OK**
Shear Capacity of Rib check for loss of support case	=	**OK**

METHODOLOGY AND CONSTRUCTION SEQUENCE

1) Clear topsoil and form a level building platform (hardfill as required).

2) Ensure/confirm 100 kPa allowable bearing capacity unless a specific design has been carried out for lower capacities.

3) In accordance with NZS3604:2011 expansive clay shall be assumed to be present in the soil supporting the foundation unless:
   (a) Reasonable enquiry does not reveal any incidence of major cracks in dry weather on the building site itself or in the surrounding locality
   (b) The locality has not been indentified as an area where expansive clay is likely to be found
   (c) Excavation for foundation does not reveal plastic clay

   or

   Geotechnical investigations have been carried out and do not reveal expansive clays

4) Where expansive clays have been identified, additional reinforcing and other details may be required, and a specific design by HFC Structures Ltd is required.

5) Cover building platform with 20 mm sand blinding.

6) Cover blinding with DPC.

7) Place 1100 x 1100 x 220 polystyrene panels in a pattern as shown on the foundation plan (i.e. 1200 x 1200 grid)

8) Cut out additional internal load bearing foundation thickenings where shown and reinforce slab and thickenings (refer to additional details for expansive clays).

9) Refer to special details required for expansive soils (if any) and provide additional reinforcing to suit.

10) Refer to architectural drawings for all dimensions, recesses and under slab service locations.

11) Waste pipes to be installed in accordance with the New Zealand Building Code.

12) Place reinforcing, pour topping slab, internal and exterior thickenings in one operation.

13) Seismic 500E Grade Mesh as per engineering drawings on S99. Saw cut slab in accordance with the drawings.

14) Concrete as per S99 to be used unless noted otherwise. Cure slab in accordance with the good building practices.

15) All HD12 Grade 500 laps shall be 600 mm minimum.

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 3

Structural Egr's PS1, Calculations & Inspection Schedule

STRUCTURAL CALCULATIONS

105 Redvale Road

Redwood Valley

For

Andrew Shepard

Vector Structural Engineering Ltd
03 928 0860 | admin@vse.co.nz | www.vse.co.nz | 171 Rutherford Street, Nelson 7042

VECTOR
Structural Engineering

JOB NAME	105 Redvale Road		
DATE	21/01/22	JOB NO.	22008
CALC'D BY	WH	SHEET NO.	1

Location : Redwood valley

Site wind speed : $V_R = 45$

$M_z = 0.87$ (TC 2.5)

$M_d = 0.9$

$M_s = 1$

$M_t = 1.31$

$V_{site} = 46.1 m/s$

$W_u = 1.3 kPa$

Seismic $Z = 0.26$

$R_u = 1$

$N(T,D) = 1$

$C_h(T) = 3$

$T = 0.4$

$\mu = 1.25$

$S_p = 0.925$

$k_\mu = 1.14$

$C_D(T)_u = 0.63$

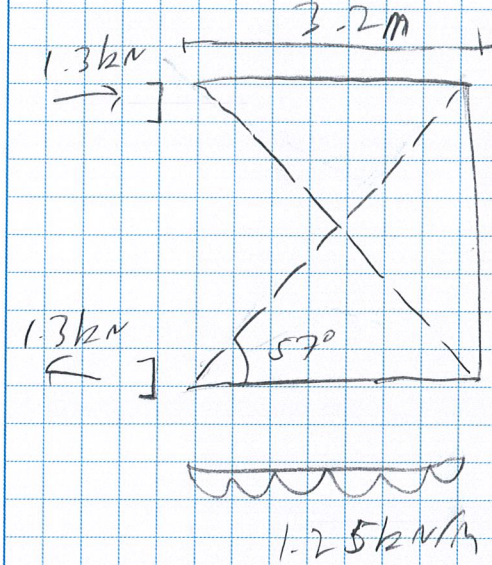
$C_D(T)_s = 0.14$

171 Rutherford Street, Nelson 7010
P: 03 928 0860 | E: admin@vse.co.nz | W: www.vse.co.nz

VECTOR
Structural Engineering

JOB NAME	105 Redvale Road		
DATE	21/01/22	JOB NO.	22008
CALC'D BY	WH	SHEET NO.	2.0

Use roof straps to brace Alfresco



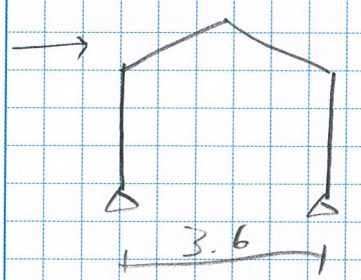
Multibrace strap

$N_f^* = 4.1kN$
$\phi N = 10kN$ OK

171 Rutherford Street, Nelson 7010
P: 03 928 0860 | E: admin@vse.co.nz | W: www.vse.co.nz

Line Q bracing - 2 options : • portal
• longer bracing walls

Portal : trusses taking gravity load



Wind = 1.25m × 4.75m × (0.7 + 0.5) × 1.3 kPa
= 9.2 kN ULS
= 6.5 kN SLS

EQ$_u$ = 9.1 kN
EQ$_s$ = 2 kN

Microstran model → 230PFC

d_{SLS} = 7mm
M^* = 12.7kNm
ϕM_n = 45kNm OK
R_u = ±8.8kN
R_s = ± 5kN

Try bracing walls using ~~EPBG~~ EPBG : Wind 100 BU/m
EQ 115 BU/m

Bracing element height 2.6m

1.1m bracing elements → $2 \times \frac{2.4}{2.6} \times 1.1 \times 100$ = 203BU

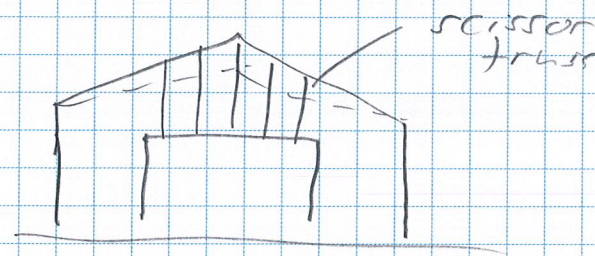
Demand = 184BU

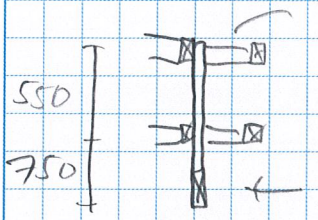
→ 2 / EPBG / 1.1m OK

VECTOR
Structural Engineering

JOB NAME	105 Redvale Road		
DATE	22/07/22	JOB NO.	22008
CALC'D BY	WH	SHEET NO.	

Gable / living area face load support





W_u = @ 0.7 × 1.3 × 1.6 = 1.5 kN/m

Framing at 600 c/c

M^* = 0.67 kNm

90×45 SG8 ϕM_n = 0.7 kNm OK

Reactions = 1.2 kN

12g × 100mm screw ϕN = 3kN OK

171 Rutherford Street, Nelson 7010
P: 03 928 0860 | E: admin@vse.co.nz | W: www.vse.co.nz

Building Code Clause(s).....B1.....

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on the use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: .....**Vector Structural Engineering Ltd**.....
(Design Firm)

TO:.....**Andrew Shepherd**.....
(Owner/Developer)

TO BE SUPPLIED TO: … ...**Tasman District Council** .....
(Building Consent Authority)

IN RESPECT OF: ..... **Alfresco bracing, dining/living area bracing, gable face loading support.** .....
(Description of Building Work)

AT: … .....**105 Redvale Road** .....
(Address)

Town/City: … ..... **Redwood Valley** .....**LOT**……**14**……. **DP** ……**476117**..…… **SO** ……

We have been engaged by the owner/developer referred to above to provide:
Structural Engineering Design
(Extent of Engagement)

services in respect of the requirements of Clause(s) ……**B1**…….. of the Building Code for
☐ All or ■ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

■ Compliance Documents issued by the Ministry of Business, Innovation & Employment **B1/AS1 & VM1/VM4**……or
(verification method / acceptable solution)

☐ Alternative solution as per the attached schedule .....

The proposed building work covered by this producer statement is described on drawings titled: **Tangata Homes drawings title New Dwelling Andrew Shepherd at 105 Redvale Road, Galeo and numbered sheets A2.04, A4.01**
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions ……**refer inspection schedule**……
(ii) All proprietary products meeting their performance specification requirements.

I **believe on reasonable grounds** that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:
☐CM1 ☐CM2 ■CM3 ☐CM4 ☐CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, **Gregory Neil MELVIN** …… am: ■CPEng # ….**224448**…. ☐Reg Arch #……
(Name of Design Professional)

I am a Member of: ■ Engineering New Zealand ☐NZIA and hold the following qualifications: **B.E, CMEngNZ, CP Eng**
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY …… **Gregory Neil MELVIN** ……(signature)……
(Name of Design Review Professional

ON BEHALF OF …**Vector Structural Engineering Ltd**…… Date……**21.02.2022**……
(Design Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1992. The producer statements were developed by a combined committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suite of producer statements has been revised at the date of this form as a result of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code of Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design	Intended for use by a suitable qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;
PS2 Design Review	Intended for use by a suitable qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;
PS3 Construction	Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013[1] or schedules E1/E2 of NZIA's SCC 2011[2]
PS4 Construction Review	Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate. This must be accompanied by a statement of completion of building work (Schedule 6)

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and the competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence-based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ) or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

***Professional Indemnity Insurance**

As part of membership requirements, ACENZ requires all member firms to Professional Indemnity Insurance to a minimum level.

The PI insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5)[3] (OL1-OL4)[2]. The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013

2 NZIA Standard Conditions of Contract SCC 2011 (1st edition)

3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)

4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org
www.nzia.co.nz

CERTIFICATE OF DESIGN WORK
MEMORANDUM FROM LICENSED BUILDING PRACTITIONER

Section 30C and Section 45, Building Act 2004

The Building

Street address	105 Redvale Road		
Suburb	Redwood Valley	**Town/city**	Richmond
Postcode	7081	**Building consent no.**	

The Owner

Name(s)	Andrew Shepard C/- Tangata Homes		
Email	michael@tangatahomes.co.nz	**Phone**	021 089 01830
Address			

Basis for providing this memorandum

I am providing this memorandum in my role as the **specialist** designer who carried out or supervised specific Primary structure elements of restricted building work (RBW) design work as described in this memorandum. Other designers will provide memoranda covering the remaining RBW design work. Refer also to the attached PS1.

Identification of restricted building work (RBW) design work

I, Gregory Neil Melvin carried out or supervised the following RBW design work:

Primary structure: B1

Design work that is RBW		Description (as required) and reference to plans and specifications	Carried out or supervised
Foundations and subfloor framing	✗		
Retaining walls	✗		
Beams	✗		
Portal	✗		
Bracing	✓	Dining/living area bracing and alfresco bracing	Supervised
Other (primary)	✓	Living area gable wind face loading support	Supervised

Note: SED = Elements subject to Specific Engineering Design outside of the scope of NZS3604:2011, unless otherwise noted.

Initial _____ **Date** 21/02/22

Waivers and modifications

Are waivers or modifications of the Building Code required? No

If yes, please provide details of the waivers or modifications:

Building Code clause	Waiver/modification required

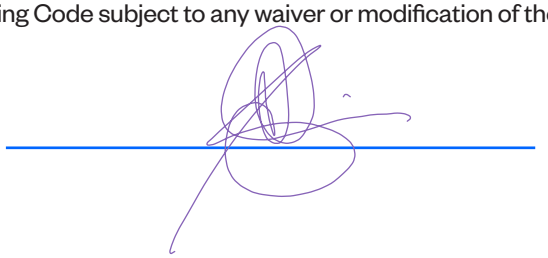
Issued by

Name	Gregory Neil Melvin	**Design entity/company**	Vector Structural Engineering Ltd
Chartered status	CPEng	**Chartered no.**	224448
Email	greg@vse.co.nz	**Website**	
Phone (daytime)	039280860	**Phone (after hours)**	
Mobile			
Postal address	171 Rutherford St, NELSON 7010		
Physical address	171 Rutherford St, NELSON 7010		

Declaration

I, Gregory Neil Melvin, LBP state that I have applied the skills and care reasonably required of a competent design professional in carrying out or supervising the RBW described in this memorandum and that based on this, I certify that the RBW described in this memorandum:

- complies with the Building Code; or
- complies with the Building Code subject to any waiver or modification of the Building Code described in this memorandum.

Signature  **Date** 21/02/22

CONSTRUCTION MONITORING SCHEDULE

Schedule of inspections for

Address 105 Redvale Road, Redwood Valley, Richmond 7081

We confirm that Vector Structural Engineering have been engaged to undertake construction monitoring of the specific engineering design items to an Engineering New Zealand/ACENZ CM3 level and propose to undertake at least the following site inspections:

No.	Item of inspection	Timeframe
1	Bracing walls	While all connections are clearly visible, pre-line
2	Floor, roof & ceiling diaphragms	While all connections are clearly visible, pre-line
3	Wall framing above living room gable fac	While all connections are clearly visible, pre-line
4	Foundation beams, pads and slabs	Pre-pour but reinforcing to be put in place
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-



Notes:

a) The above items of inspection are the minimum required to enable Vector Structural Engineering to issue a PS4 – Producer Statement Construction Review for the specific engineering design items.

b) The above items of inspection do not cover work constructed in accordance with NZS 3604:2011, for which inspections are to be undertaken by the Building Consent Authority.

c) The Contractor/Builder is to provide Vector Structural Engineering at least 24 hours' notice of the requirement for an inspection. The above timeframes are indicative, the Engineer and Contractor are to agree the timing of inspection prior to work commencing on site.

d) A copy of this inspection schedule is to be held on site during the works, and the Contractor/Builder is to provide reasonable and safe access to enable works to be inspected according to the schedule.

e) The above schedule does not necessarily represent the actual number of inspections to be undertaken. The number of inspections will depend on the construction method, sequence of the works and whether or not unforeseen conditions or difficulties are encountered on site.

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 4

Truss Layout & Truss Mftr's PS1

Nelson ITM
PO Box 9002, Nelson, 7044, Ph 03 548 5487, Fax 03 5464880

Date: 23-11-2021
Ver 4.5.5

Fabricator / Designer Statement

Job Ref: **10722**

This statement may be used by the Building Consent Authority for compliance purposes and is issued by a licensed truss fabricator using the Pryda Build software.

CLIENT Name: *Lynch Construction*

SITE Details:

Address : *105 Redvale Road, Galeo*
Redwood Valley

City:

Post Code:

Nominal Design Criteria:

Design working life: 50 years
Building importance: Residential (Importance Level 2)
Roofing: Longrun (6.0 kg/sq.m)
Ceiling: Specified (8.5 kg/sq.m)
Top chord purlins: 900 mm

Design roof snow load: 0 Pa
(incl. probability factor
Ground snow load: 0 Pa
Location: Region N3 - Marlborough
Altitude above sea lev 100 m

BC restraints: Battens at 1800 mm crs
Standard truss spacing 900 mm
Standard roof pitch: 25.00 deg.
Ult. design wind speed 50 m/s (wind classification = Very

Max. eaves height: 3 m
Max. ridge height: 6 m

Int pressure coeff. up: 0.2
Overhang Condition: Metal fascia

The correctness of the Design Criteria used by the Pryda Build truss design software is the responsibility of the fabricator.
Note : Where relevant, a structural fascia beam is required at all hip and dutch hip corners to support the short creeper/rafter overhangs, as shown in AS4440-2004
Note: This statement must be read in conjuction with the truss layout and detail sheets.
Note: Some trusses in this job support ceiling materials that are different to this nominal data (see individual truss detail sheets).
Note: The Structural Timber products supplied in this building stores approximately '2940' kg of carbon.

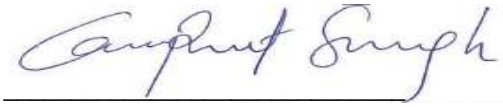
All truss designs and their connections have been designed using Pryda design software. Additional items such as roof/ceiling plane bracing, special notes, supplementary timber, etc., which may be shown on the plan drawings are the responsibility of others.

All trusses have been manufactured in accordance with the fabrication specifications provided by Pryda, and shall be installed, connected and braced in accordance with the recommendations given in - : AS4440:2004 "Installation of nailplated timber roof trusses" and any other supplementary details that may be provided, such as the Pryda Installation Guides.

Timber verification and grading values are in accordance with clause B1 and timber treatment in accordance with clause B2 of the New Zealand Building Code.

I/we confirm that the trusses for this project have been manufactured in accordance with the fabrication specifications provided by Pryda New Zealand.

Name: Gurpreet Singh Position: Estimator

Signed:  Date: 23-11-2021

Fabricator / Designer Statement

Job Ref: **10722**

Note 1: All timber framing nails are machine-driven, glue coated, or annular/helical deformed shank. Use specified fixings with Pryda connectors as noted.

Note 2: The following trusses have not yet fully passed all of the design criteria, eg:-

Truss Mark	Status
BR1	Fixings and connections have not been designed.
BR6	Fixings and connections have not been designed.
BR2	Fixings and connections have not been designed.
BR3	Fixings and connections have not been designed.
BR5	Fixings and connections have not been designed.
BR8	Fixings and connections have not been designed.
BR10	Fixings and connections have not been designed.
BR7	Fixings and connections have not been designed.
BR9	Fixings and connections have not been designed.
VN	Fixings and connections have not been designed.
BR11	Fixings and connections have not been designed.
BR4	Fixings and connections have not been designed.

Tie-downs to walls/beams:

Trusses need to be fixed at each timber support with 2/90x3.15 dia Skew Nails.

All additional tie-downs are as follows:

Truss Mark	Sup No.	Distance	Fixing	Support Jt Grp	Support Width	Truss Jt Grp	Uplift (kN)	Fixing Details
S1	1	-	1/NPPC4	JD5	90	JD5	-2.30	2/12g-11x35 screws, 6/30x3.15d nails
	3	2140	1/NPPC4	JD5	90	JD5	-2.30	2/12g-11x35 screws, 6/30x3.15d nails
S10	1	-	1/NPPC4	JD5	90	JD5	-1.24	2/12g-11x35 screws, 6/30x3.15d nails
	4	2445	1/NPPC6	JD5	90	JD5	-3.89	3/12g-11x35 screws, 9/30x3.15d nails
	7	5280	1/NPPC4	JD5	90	JD5	-1.34	2/12g-11x35 screws, 6/30x3.15d nails
S11	1	0	1/NPPC4	JD5	90	JD5	-3.13	2/12g-11x35 screws, 6/30x3.15d nails
	7	5280	1/NPPC4	JD5	90	JD5	-3.13	2/12g-11x35 screws, 6/30x3.15d nails
S12	4	2400	1/NPPC6	JD5	90	JD5	-3.81	3/12g-11x35 screws, 9/30x3.15d nails
	7	5235	1/NPPC4	JD5	90	JD5	-1.37	2/12g-11x35 screws, 6/30x3.15d nails
S13	1	0	1/NPPC4	JD5	90	JD5	-3.09	2/12g-11x35 screws, 6/30x3.15d nails
	7	5280	1/NPPC4	JD5	90	JD5	-3.09	2/12g-11x35 screws, 6/30x3.15d nails
S16	1	-	1/NPPC4	JD5	90	JD5	-2.51	2/12g-11x35 screws, 6/30x3.15d nails
	5	5130	1/NPPC4	JD5	90	JD5	-2.45	2/12g-11x35 screws, 6/30x3.15d nails
S17	1	-	1/NPPC4	JD5	90	JD5	-3.18	2/12g-11x35 screws, 6/30x3.15d nails
	12	5130	1/NPPC4	JD5	90	JD5	-3.38	2/12g-11x35 screws, 6/30x3.15d nails
	2	465	1/NPPC4	JD5	90	JD5	-1.18	2/12g-11x35 screws, 6/30x3.15d nails
S18	1	-	1/NPPC4	JD5	90	JD5	-3.00	2/12g-11x35 screws, 6/30x3.15d nails
	7	5130	1/NPPC4	JD5	90	JD5	-3.00	2/12g-11x35 screws, 6/30x3.15d nails
S19	1	-	2/Z	JD5	90	JD5	-1.06	
	10	3090	2/Z	JD5	70	JD5	-0.51	
	11	3490	2/Z	JD5	70	JD5	-0.66	
	12	3890	2/Z	JD5	70	JD5	-0.73	
	13	4290	2/Z	JD5	70	JD5	-0.75	
	14	4690	2/Z	JD5	70	JD5	-0.71	
	15	5090	2/Z	JD5	70	JD5	-0.71	
	16	5490	2/Z	JD5	70	JD5	-1.08	
	19	6180	2/Z	JD5	90	JD5	-1.05	
	4	690	2/Z	JD5	70	JD5	-1.08	
	5	1090	2/Z	JD5	70	JD5	-0.71	
	6	1490	2/Z	JD5	70	JD5	-0.71	
	7	1890	2/Z	JD5	70	JD5	-0.75	
	8	2290	2/Z	JD5	70	JD5	-0.73	
	9	2690	2/Z	JD5	70	JD5	-0.66	
S2	1	-	1/NPPC6	JD5	90	JD5	-3.61	3/12g-11x35 screws, 9/30x3.15d nails
	7	6180	1/NPPC6	JD5	90	JD5	-3.61	3/12g-11x35 screws, 9/30x3.15d nails
S20	1	-	2/Z	JD5	90	JD5	-1.34	
	10	3366	2/Z	JD5	70	JD5	-0.59	
	11	3810	2/Z	JD5	90	JD5	-0.56	
	4	966	2/Z	JD5	70	JD5	-1.73	
	5	1366	2/Z	JD5	70	JD5	-0.75	
	6	1766	2/Z	JD5	70	JD5	-0.75	
	7	2166	2/Z	JD5	70	JD5	-0.74	
	8	2566	2/Z	JD5	70	JD5	-0.72	
	9	2966	2/Z	JD5	70	JD5	-0.79	
S21	1	0	2/Z	JD5	70	JD5	-0.45	
	10	3319	2/Z	JD5	70	JD5	-0.87	
	13	3960	2/Z	JD5	90	JD5	-1.25	
	2	90	2/Z	JD5	90	JD5	-0.39	
	3	519	2/Z	JD5	70	JD5	-0.51	

Fabricator / Designer Statement

Job Ref: **10722**

	4	919	2/Z	JD5	70	JD5	-0.79	
	5	1319	2/Z	JD5	70	JD5	-0.91	
	6	1719	2/Z	JD5	70	JD5	-0.73	
	7	2119	2/Z	JD5	70	JD5	-0.74	
	8	2519	2/Z	JD5	70	JD5	-0.77	
	9	2919	2/Z	JD5	70	JD5	-0.78	
S22	1	-	1/NPPC4	JD5	90	JD5	-1.49	2/12g-11x35 screws, 6/30x3.15d nails
	15	5280	1/NPPC4	JD5	90	JD5	-1.49	2/12g-11x35 screws, 6/30x3.15d nails
S3	1	-	1/NPPC4	JD5	90	JD5	-3.19	2/12g-11x35 screws, 6/30x3.15d nails
S4	1	-	1/NPPC4	JD5	90	JD5	-2.98	2/12g-11x35 screws, 6/30x3.15d nails
	5	5130	1/NPPC4	JD5	90	JD5	-2.92	2/12g-11x35 screws, 6/30x3.15d nails
S5	1	-	1/NPPC4	JD5	90	JD5	-2.22	2/12g-11x35 screws, 6/30x3.15d nails
	5	5130	1/NPPC4	JD5	90	JD5	-2.21	2/12g-11x35 screws, 6/30x3.15d nails
S6	1	-	1/NPPC4	JD5	90	JD5	-3.00	2/12g-11x35 screws, 6/30x3.15d nails
	7	5130	1/NPPC4	JD5	90	JD5	-3.00	2/12g-11x35 screws, 6/30x3.15d nails
S7	1	-	1/NPPC4	JD5	90	JD5	-2.73	2/12g-11x35 screws, 6/30x3.15d nails
	6	4710	1/NPPC4	JD5	90	JD5	-2.79	2/12g-11x35 screws, 6/30x3.15d nails
S8	1	0	1/NPPC4	JD5	90	JD5	-3.08	2/12g-11x35 screws, 6/30x3.15d nails
	7	5280	1/NPPC4	JD5	90	JD5	-3.08	2/12g-11x35 screws, 6/30x3.15d nails
S9	1	0	1/NPPC4	JD5	90	JD5	-3.06	2/12g-11x35 screws, 6/30x3.15d nails
	7	5280	1/NPPC4	JD5	90	JD5	-3.06	2/12g-11x35 screws, 6/30x3.15d nails
SG1	1	-	1/NPPC4	JD5	88	JD5	-3.35	2/12g-11x35 screws, 6/30x3.15d nails
	3	2148	2/Z	JD5	90	JD5	-2.99	
SG2	1	-	1/NPPC6	JD5	90	JD5	-4.47	3/12g-11x35 screws, 9/30x3.15d nails
	5	2140	1/NPPC8	JD5	90	JD5	-6.22	4/12g-11x35 screws, 12/30x3.15d nails

Primary connections (truss to girder):

Truss Marks			Fixing Details	
Girder	Supported	Connector	Girder	Supported
SG1	S12	FB4590	8/30x3.15d nails	4/30x3.15d nails
SG2	S3	2/MG	8/30x3.15d nails	8/30x3.15d nails

Secondary fixings (hip & gable ends, valleys):

All trusses are to be fixed at each support with the following:

Hip truss to truncated girder	3 face nails, bottom chords
Jack truss to truncated girder	3 skew nails or back face nails, bottom chords
Creeper truss to hip truss	3 face nails, top and bottom chords
Top chord extensions	2 skew nails
Valley trusses	1 skew nail
Outriggers	2 skew nails

All additional connections are as follows:

Supporting Truss	Supported Truss	Top Chord	Bottom Chord
S20	OR3	1/MGL	-

Fixing Summary:

Connector	Description	Total	Fixing Method (per connector)	
Primary			Girder	Supported Truss
FB4590	Joist hanger	2	8/30x3.15d nails	4/30x3.15d nails
MG	Multigrips	4	8/30x3.15d nails	8/30x3.15d nails
Secondary			Supporting Truss	Supported Truss
MGL	Multigrip (long)	7	6/30x3.15d nails	4/30x3.15d nails
Tiedown			Support	Truss
NPPC4	Purlin cleat	96	2/12g-11x35 screws	6/30x3.15d nails
NPPC6	Purlin cleat	16	3/12g-11x35 screws	9/30x3.15d nails

Fabricator / Designer Statement

Job Ref: **10722**

Tiedown			*Support*	*Truss*
NPPC8	Purlin cleat	1	4/12g-11x35 screws	12/30x3.15d nails
Z	Z nail	72		

Nelson ITM
PO Box 9002, Nelson, 7044, Ph 03 548 5487, Fax 03 5464880

Date: 23-11-2021
Ver 4.5.5

Producer Statement - PS1 - Design

Job Ref: **10722**

This producer statement applies to the structural engineering design software "Pryda Build" supplied by Pryda NZ to

Nelson ITM

These truss designs are in accordance with sound and widely accepted engineering principles. I believe on reasonable grounds that if constructed in accordance with the design, the trusses will comply with relevant requirements of the New Zealand Building Code, Clause B1 and Verification Method B1/VM1. The durability shall comply with the New Zealand Building Code, Clause B2, for building importance level 2 and a design working life of 50 years.

In addition to the above, this software also complies in part with:

ANSI / TPI 1 - 2002 National Design Standard for metal plate connected wood truss construction.

AS 1649 - 2001 Timber - Methods of test for mechanical fasteners and connectors - Basic working loads and characteristic strengths.

The truss designs require that the supporting structure is stable in its own right, and that the trusses will be braced in accordance with the New Zealand Building Code Standard NZS 3604:2011, and any supplementary details provided, including but not limited to Pryda Installation Guides.

Pryda NZ holds a current policy of Professional Indemnity Insurance with cover no less than NZ$2 million. The policy includes the engineering design processes used in the software.

On behalf of Pryda NZ (a division of ITW New Zealand)

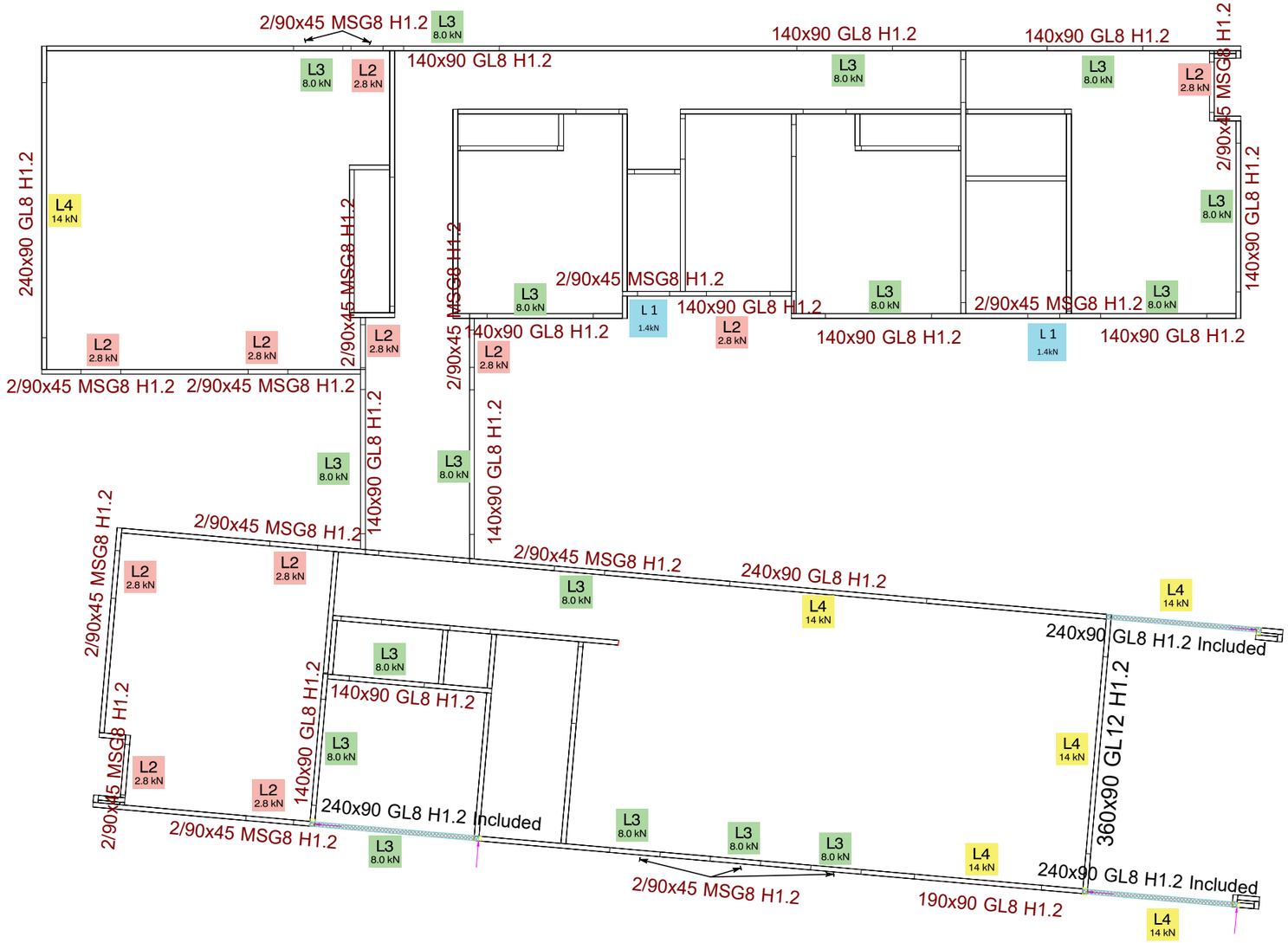


André van Blerk
Chartered Professional Engineer
BSc (Eng) CMEngNZ (214689), CPEng, IntPE

Nelson ITM ~ PO Box 9002, Nelson, 7044, Ph 03 548 5487, Fax 03 5464880

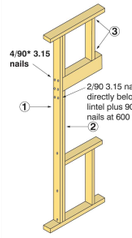
Thursday, 17 February 2022

Job Ref: 10722



TIMBER LINTEL FIXING - 1.4KN

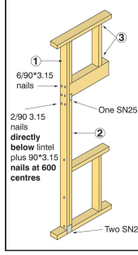
Consent Doc. Ref. L1



1. For trimming stud thickness refer to Table 8.5 NZS 3604:2011. Additional studs to that shown to have a minimum stud to stud fixing of 11/90*3.15 nails.
2. Where a double stud which provides support for a lintel is shorter by 400mm or more than the full stud height, its thickness shall not be included as contributing to the thickness of the trimming studs.
3. Studs & jacks to be fixed to top plate in accordance with the Pryda Top Plate Fixing Guide.

TIMBER LINTEL FIXING - 2.8KN

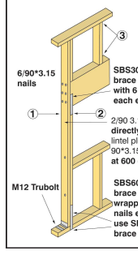
Consent Doc. Ref. L2



1. For trimming stud thickness refer to Table 8.5 NZS 3604:2011. Additional studs to that shown to have a minimum stud to stud fixing of 11/90*3.15 nails.
2. Where a double stud which provides support for a lintel is shorter by 400mm or more than the full stud height, its thickness shall not be included as contributing to the thickness of the trimming studs.
3. Studs & jacks to be fixed to top plate in accordance with the Pryda Top Plate Fixing Guide.

TIMBER LINTEL FIXING - 8.0KN

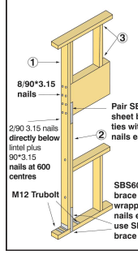
Consent Doc. Ref. L3



1. For trimming stud thickness refer to Table 8.5 NZS 3604:2011. Additional studs to that shown to have a minimum stud to stud fixing of 11/90*3.15 nails.
2. Where a double stud which provides support for a lintel is shorter by 400mm or more than the full stud height, its thickness shall not be included as contributing to the thickness of the trimming studs.
3. Studs & jacks to be fixed to top plate in accordance with the Pryda Top Plate Fixing Guide.

TIMBER LINTEL FIXING - 14KN

Consent Doc. Ref. L4



1. For trimming stud thickness refer to Table 8.5 NZS 3604:2011. Additional studs to that shown to have a minimum stud to stud fixing of 11/90*3.15 nails.
2. Where a double stud which provides support for a lintel is shorter by 400mm or more than the full stud height, its thickness shall not be included as contributing to the thickness of the trimming studs.
3. Studs & jacks to be fixed to top plate in accordance with the Pryda Top Plate Fixing Guide.

FTMA NEW ZEALAND

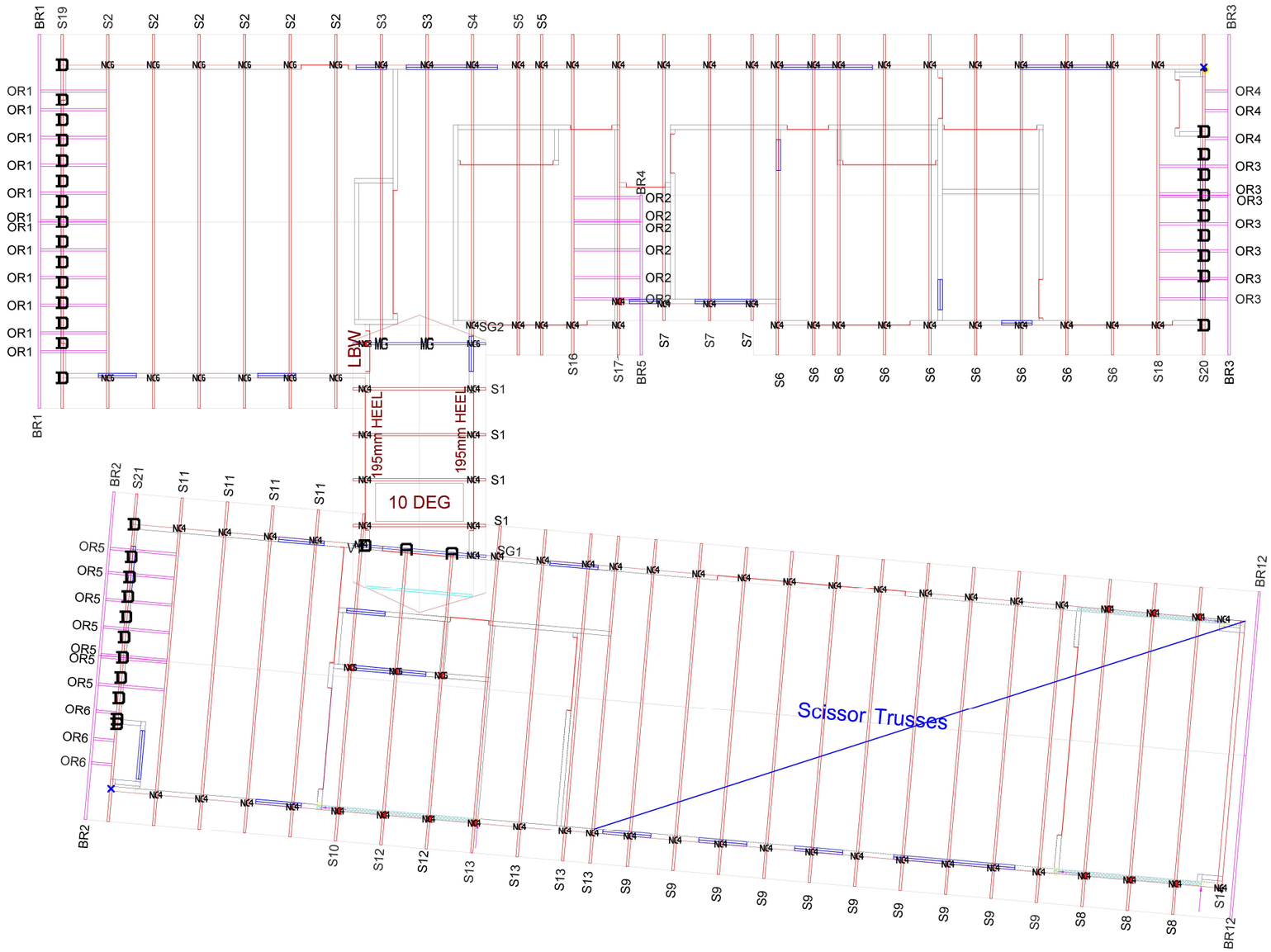
FRAME & TRUSS

Customer : Lynch Construction
Site Address : 105 Redvale Road, Galeo
: Redwood Valley

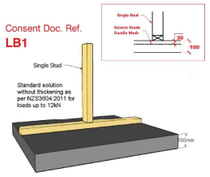
Sheet Title:
For Consent
Lintel Fixing

Detailer: Lia

Roofing:	: Longrun
Pitch	: 25.00 Deg.
Ceiling Material:	: Specified (8.5 kg/sq.m.)
Design Wind Velocity:	: 50.00 m/s (Ult.)
Roof Snow Load:	: @SNOWLOAD@

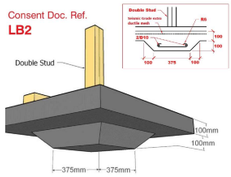


Consent Doc. Ref.
LB1



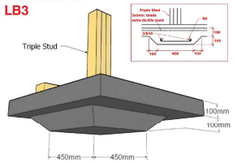
12kN load		SG8
Height m	Stud size (mm)	No. of studs under load
2.4	90 x 45	1
2.7	90 x 45	2
3.0	90 x 45	2

Consent Doc. Ref.
LB2



24kN load		SG8
Height m	Stud size (mm)	No. of studs under load
2.4	90 x 45	2
2.7	90 x 45	2
3.0	90 x 45	3

Consent Doc. Ref.
LB3



36kN load		SG8
Height m	Stud size (mm)	No. of studs under load
2.4	90 x 45	3
2.7	90 x 45	3
3.0	90 x 45	4

NO LOADS EXCEED -8KN ULSL -NO SLAB THICKENING REQUIRED

FTMA NEW ZEALAND

FRAME & TRUSS

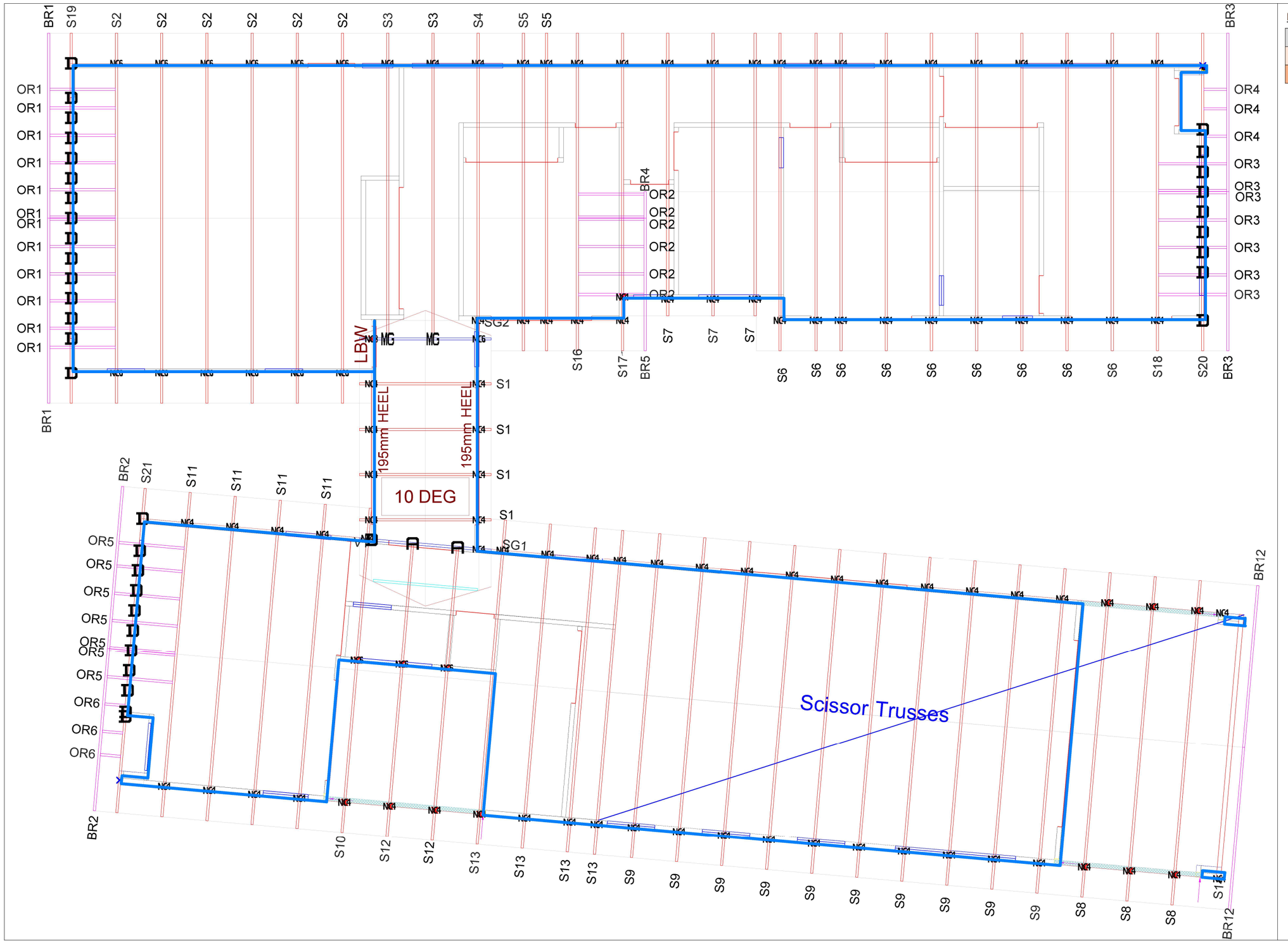
Customer : Lynch Construction
Site Address : 105 Redvale Road, Galeo
: Redwood Valley

Sheet Title:
For Consent
Slab Thickening
Detailer: Lia

Roofing: : Longrun
Pitch : 25.00 Deg.
Ceiling Material: : Specified (8.5 kg/sq.m.)
Design Wind Velocity: : 50.00 m/s (Ult.)
Roof Snow Load: : @SNOWLOAD@

pryda

Nelson ITM ~ PO Box 9002, Nelson, 7044, Ph 03 548 5487, Fax 03 5464880	Thursday, 17 February 2022	Job Ref: 10722



Fixing Types:

N	- Nominal fixing using 2/ 90x3.15 end nails
P1	- M8 x 100 Pryda Stud Screw (WM8100PS) in 1/45 top plate or M8 x 150 Pryda Stud Screw (WM8150PS) in 2/45 top plates.
P2	- M8 x 150 Pryda Stud Screw (WM8150PS) in 1/45 top plate.

Pryda Stud Screw Reference

N

P1

P2

FTMA NEW ZEALAND

FRAME & TRUSS

Customer	: Lynch Construction
Site Address	: 105 Redvale Road, Galeo
	: Redwood Valley

Sheet Title:
For Consent
Stud Screw Layout

Detailer: Lia

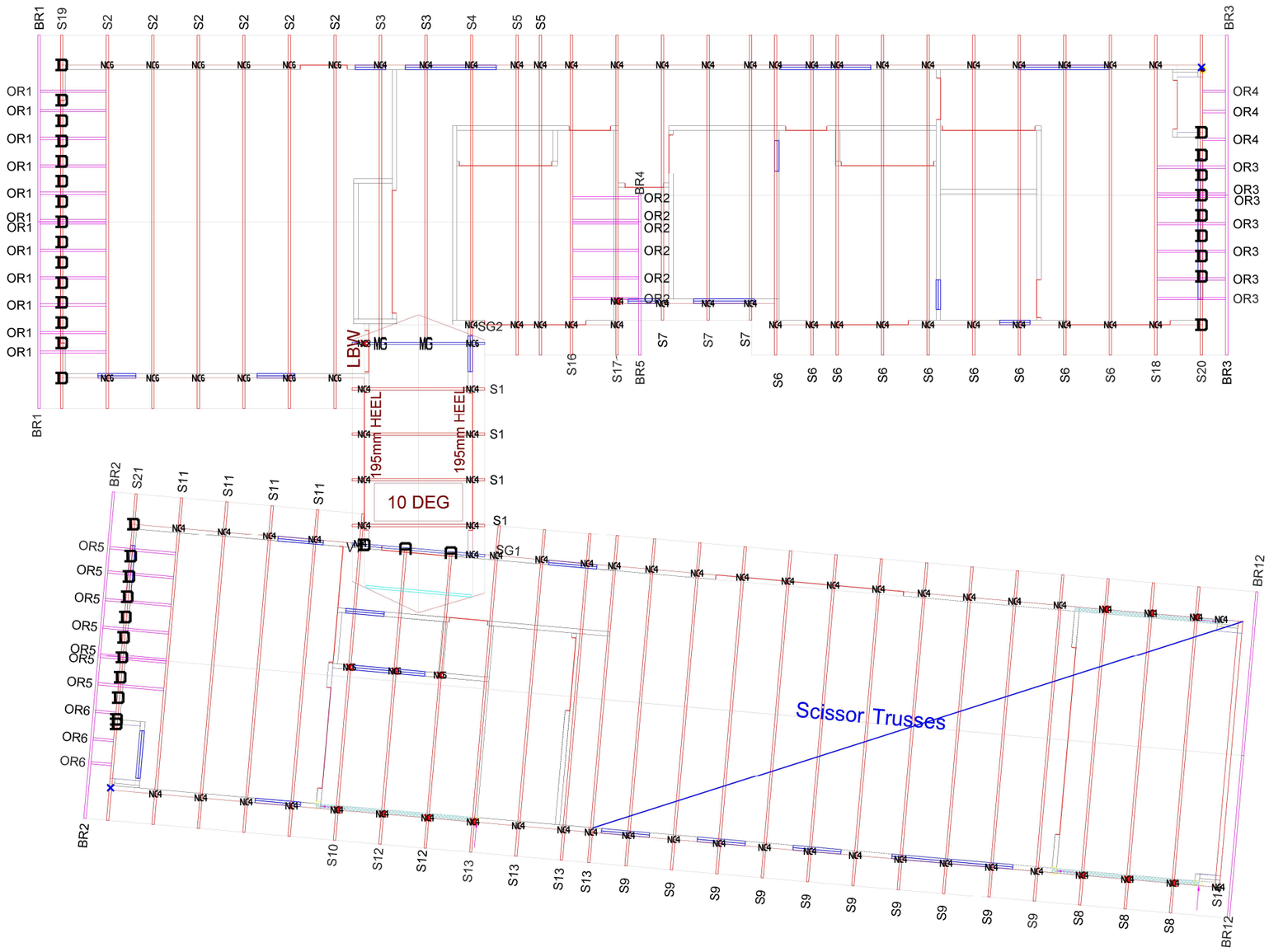
Roofing:	: Longrun
Pitch	: 25.00 Deg.
Ceiling Material:	: Specified (8.5 kg/sq.m.)
Design Wind Velocity:	: 50.00 m/s (Ult.)
Roof Snow Load:	: @SNOWLOAD@

pryda

Truss Connections

- Trusses need to be fixed at each timber support with 2/90x3.15 dia Skew Nails unless otherwise noted.

NG6	16 x 1/NPPC6 Purlin cleat
D	36 x 2/Z Z nail
NC4	96 x 1/NPPC4 Purlin cleat
NC8	1 x 1/NPPC8 Purlin cleat
A	2 x 1/FB4590 Joist hanger
MG	2 x 2/MG Multigrips



Void if ITM Nelson are not the manufacturers

FTMA NEW ZEALAND

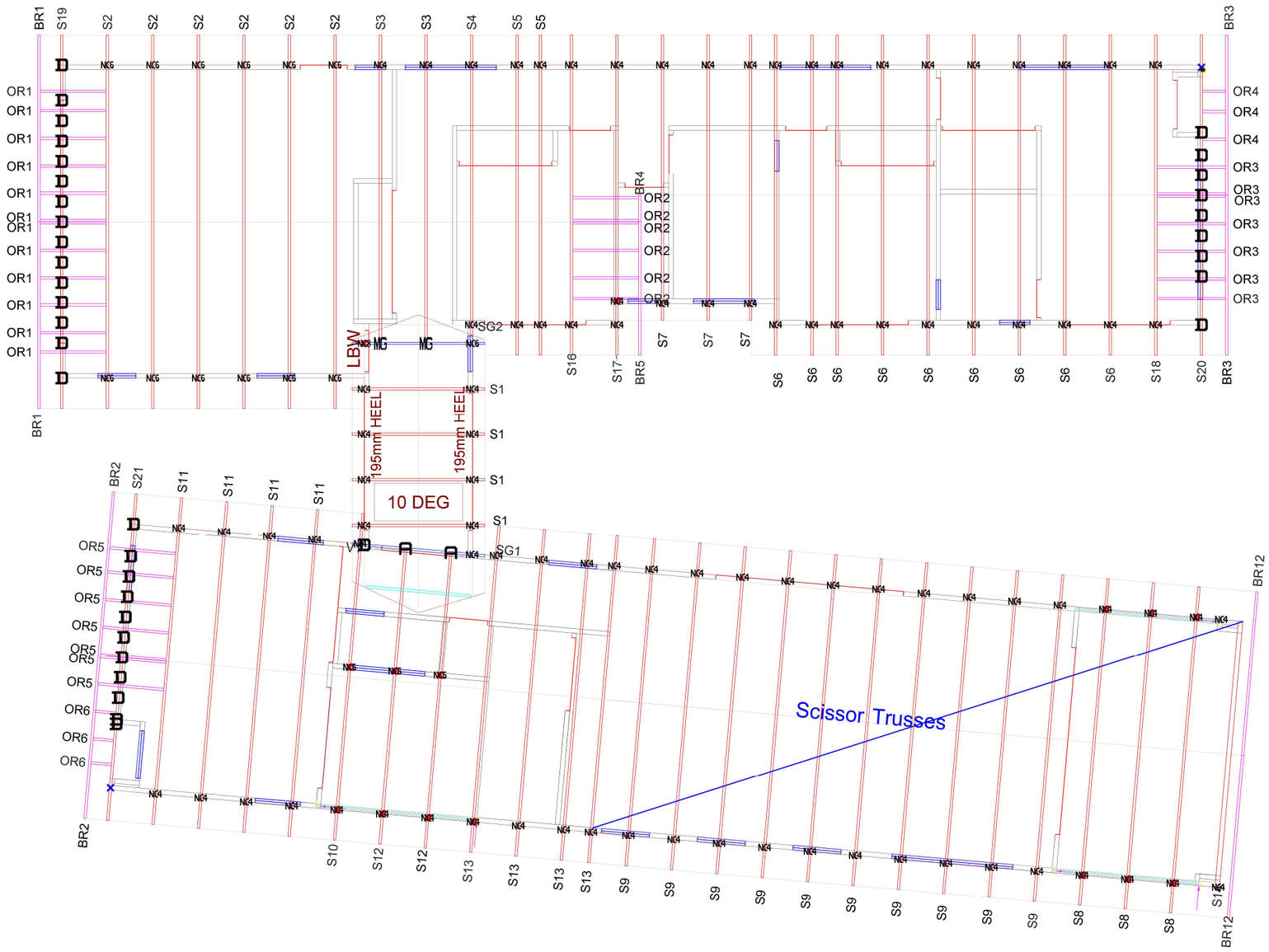
FRAME & TRUSS

Customer	: Lynch Construction
Site Address	: 105 Redvale Road, Galeo
	: Redwood Valley

Sheet Title:
For Consent
Truss Fixings
Detailer: Lia

Roofing:	: Longrun
Pitch	: 25.00 Deg.
Ceiling Material:	: Specified (8.5 kg/sq.m.)
Design Wind Velocity:	: 50.00 m/s (Ult.)
Roof Snow Load:	: @SNOWLOAD@

pryda



the end web of the truss would be setback 45mm for the strapping to run across for cladding

Void if ITM Nelson are not the manufacturers

FTMA NEW ZEALAND

FRAME & TRUSS

Customer	: Lynch Construction
Site Address	: 105 Redvale Road, Galeo
	: Redwood Valley

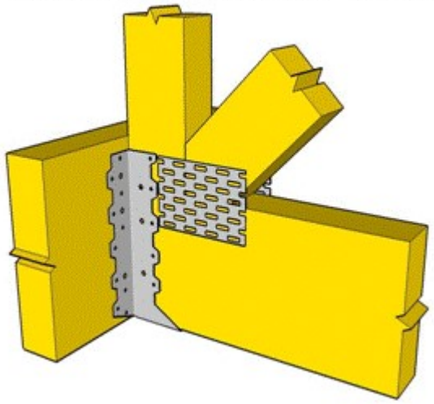
Sheet Title:
For Consent
Truss Layout
Detailer: Lia

Roofing:	: Longrun
Pitch	: 25.00 Deg.
Ceiling Material:	: Specified (8.5 kg/sq.m.)
Design Wind Velocity:	: 50.00 m/s (Ult.)
Roof Snow Load:	: @SNOWLOAD@

pryda

FRAMING BRACKET TRUSS SUPPORT

Consent Doc. Ref. **A, B, C**



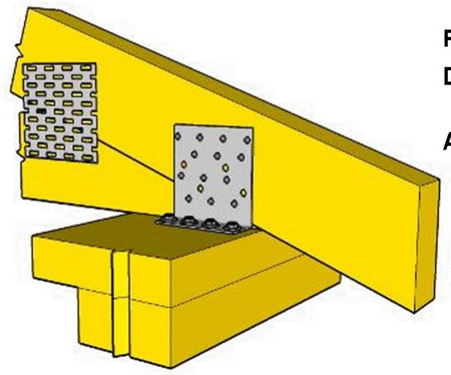
Product Code: MPFB4590, MPFB45120, MPFB45180

Durability: Suitable for all closed roof spaces. Stainless steel required in open roofs in Sea spray zone and Zone 1 in order to be compliant with Table 4.1 of NZS3604:2011.

Application: All holes filled with 30x3.15mm Pryda product nails or type 17 12g x 35mm hex head galv. screws.

CONCEALED PURLIN CLEAT TIE DOWN

Consent Doc. Ref. **NC4, NC6, NC8**



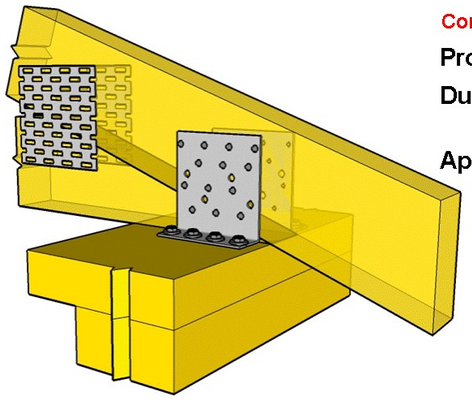
Product Code: NPPC4, NPPC6 & NPPC8

Durability: Suitable for all closed roof spaces. Compliant with Table 4.1 of NZS3604:2011.

Application: All holes in large flange filled with 30x3.15mm Pryda product nails or use 12g x 35mm hex head screws in the larger holes provided.

In small flange either Type 17 12g x 35mm screws in a single top plate situation or 14g x 75mm hex head galv. Screws in a double top plate situation.

CONCEALED PURLIN CLEAT TIE DOWN x2



Consent Doc. Ref. **2NC4, 2NC6, 2NC8**

Product Code: NPPC4, NPPC6 & NPPC8

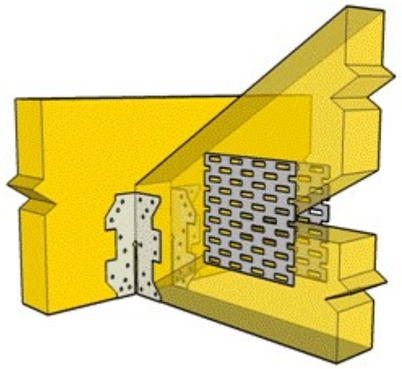
Durability: Suitable for all closed roof spaces. Compliant with Table 4.1 of NZS3604:2011.

Application: All holes in large flange filled with 30x3.15mm Pryda product nails or use 12g x 35mm hex head screws in the larger holes provided.

In small flange either Type 17 12g x 35mm screws in a single top plate situation or 14g x 75mm hex head galv. screws in a double top plate situation.

MULTIGRIP TRUSS SUPPORT

Consent Doc. Ref. **G**



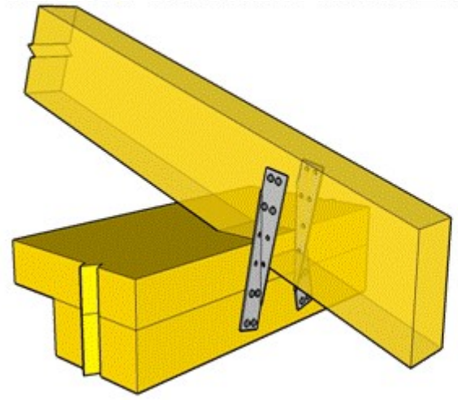
Product Code: MG*/MGL
*Also sold as MPMG

Durability: Suitable for all roof spaces that are closed. Stainless steel required in open car port roofs in Sea spray zone and Zone 1 in order to be compliant with Table 4.1 of NZS3604:2011.

Application: Used in pairs when employed as a truss to truss fixing. All holes filled with 30x3.15mm Pryda product nails.

Long Multigrip (MGL - 125mm long) to be used when top chord of supported trusses is deeper than 90mm

CEILING & PURLIN HANGER TIE DOWN x2



Consent Doc. Ref. **2CP2, 2CP9**

Product Code: CPH126, CPH190-LH & -RH

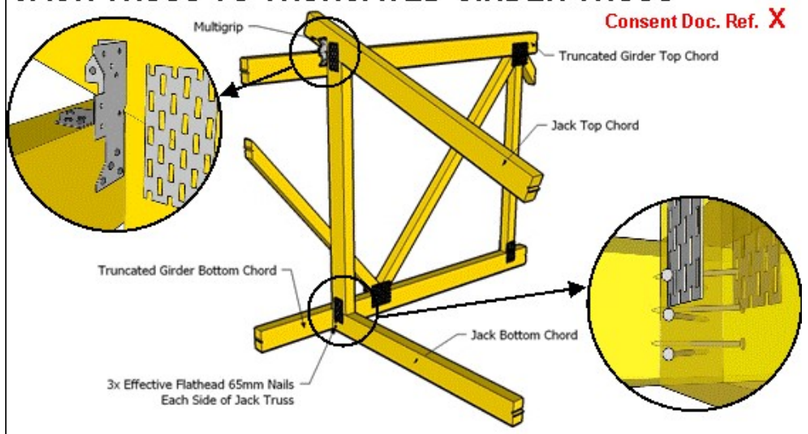
Durability: Suitable for all closed roof spaces. Stainless required in open soffits. Compliant with Table 4.1 of NZS3604:2011.

Application: Only used in as a left and right handed pair when employed as a truss tie down.

All holes filled with 30x3.15mm Pryda product nails.

JACK TRUSS TO TRUNCATED GIRDER TRUSS

Consent Doc. Ref. **X**



Product Code: MGL or MG **Application:** Use 30x3.15mm Pryda product nails. Min. 4 nails required per flange.

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 5

H1 Calculations & Details

NZBC H1/AS1 Schedule Method

Client	A Shepherd, Tangata Homes	Designed to:
Address	105 Redvale Road	NZBC H1/AS1
Lot & DP	Lot 14	NZS 4214. Method of Determining the Total Thermal
Area	Galeo	Resistance of Parts of Buildings
Job #	Tangata Homes	NZS 4218. Energy Efficiency - Small Building Envelope
Designer	A Blake	BRANZ House Insulation Guide
		http://www.designnavigator.co.nz/CRC.php

H1 Schedule:	**All Walls**				**West, South & East walls only**					**North walls only (Recommend 50% max-Best Practice)**				
Wall Insulation		R	2.80	Pink Batts	*Wall - 90x45 @ 600crs*			*R*	2.25	Refer to Wall openings sheet for Lintel sizes				
Ceiling Insulation		R	3.60	Pink Batts	*Ceiling - trusses @ 900 crs*			*R*	3.37	Roof Type (L or H)	Light	(select roof type)		
Glazing Vertical			Double	Standard	*Glazing - Standard Double glaze*			*R*	*0.26*	Wind zone (H or V)	high	(select wind zone)		
Skylights (1.5m max)			0.00	m²	*Skylight*			*R*	*0.63*	Snow zone	N3	(select snow zone)		
Floor	Total Envelope m²		165.33	100mm conc	*Floor - Ins. Raft 100mm Conc + DPM*			*R*	*1.90*	Lintels are shown	On Truss Design			
Heated Floor		m²	0.00	100mm conc	*Heated Floor*			*R*	1.90	Altitude	90	(height above sea level)		
Downlights	Closed & Abutted type				*Closed & Abutted type*					Climate Zone	3	(select climate zone)		
Ground Level	Height	Length				Height	Length				Height	Length		
Total wall length	2.42	101.72	246.16	m²	Total wall length	2.42	85.94	207.98	m²	Total wall length	2.42	15.78	38.18	m²
First Floor														
Total wall length	0.00	0.00	0.00	m²	Total wall length	0.00	0.00	0.00	m²	Total wall length	0.00	0.00	0.00	m²
Total wall length	0.00	0.00	0.00	m²	Total wall length	0.00	0.00	0.00	m²	Total wall length	0.00	0.00	0.00	m²
Total Exterior Wall area			246.16	m²	Total Exterior Wall area			207.98	m²	Total Exterior Wall area			38.18	m²
Total opening area			66.85	m²	Total opening area			49.38	m²	Total opening area			17.47	m²
H1 value			***27.16%***	***OK<30%***	***H1 value***			***23.74%***	***OK<30%***	***H1 value***			***45.74%***	

NZBC H1/AS1 Calculated Method

Client	McRae & Gray
Address	Percy Street
Lot & DP	Lot 2
Area	Marlborough
Job #	ML0040
Designer	A Blake

H1 Reference Building		*Plan (R)*	*Area*	*Rererence*	*Heat Loss*
Roof	*Pink Batts*	*3.6*	163.93	3.30	49.68
Wall	*Pink Batts*	*2.8*	246.16	2.00	123.08
Floor	*100mm conc*	*1.90*	165.33	1.30	127.18
	Heated Floor	*1.90*	0.00	1.90	0.00
Glazing < 30%	*Aluminium / Double*	*0.26*	73.85	0.26	284.03
Glazing > 30%	*Aluminium / Double*	*0.34*	-7.00	0.34	-20.58
Skylights	*Area*	*0*	0.00	0.34	0.00
				Total Loss	563.38

H1 Proposed Building		*Plan*	*Area*	*Actual*	*Heat Loss*
Roof	*Pink Batts*	*3.6*	163.93	3.37	48.64
Wall	*Pink Batts*	*2.8*	246.16	2.25	109.41
Floor	*100mm conc*	*1.9*	165.33	1.90	87.02
	Heated Floor	*1.90*	0.00	1.90	0.00
Glazing All	*Aluminium / Double*	*0.26*	66.85	0.26	257.12
					0.00
Skylights	*Area*	*0.00*	0.00	0.63	0.00
				Total Loss	502.18

	Height	*Length*		
Total wall length	2.42	101.72	246.16	*m²*
Total wall length	0.00	0	0.00	*m²*
Total wall length	0.00	0	0.00	*m²*
	Total Exterior Wall area		246.16	*m²*
	Total Glazing area		66.85	*m²*
	Glazing <30%		73.85	*m²*
	Glazing >30%		-7.00	*m²*

	Reference	*Proposed*	*Difference*
Roof	49.68	48.64	1.03
Wall	123.08	109.41	13.68
Floor	127.18	87.02	40.16
Glazing < 30%	284.03	257.12	26.92
Glazing > 30%	-20.58	0.00	-20.58
Skylights	0.00	0.00	0.00
Total Heat Loss	563.38	502.18	**61.20**

PASS

NZBC H1/AS1 Calculated Method

Start from the front door - Clockwise																	
Wall Openings - ALL			m²				Wall Openings - W,S,E			m²			Wall Openings - North			m²	
Ground Level							Ground Level						Ground Level				
	Height	Width				Orientation											
1	2.13	2.72	5.79			Front Door	1	2.13	2.72	5.79		1					
2	1.80	0.75				Garage	2					2					
3	2.00	4.80				Garage	3					3					
4	2.13	0.93				Garage	4					4					
5	0.80	0.60				Garage	5					5					
6	0.55	1.20	0.66			W/S/E	6	0.55	1.20	0.66		6					
7	0.55	1.20	0.66			W/S/E	7	0.55	1.20	0.66		7					
8	0.55	1.20	0.66			W/S/E	8	0.55	1.20	0.66		8					
9	1.80	2.00	3.60			North	9					9	1.80	2.00	3.60	North	
10	2.13	2.00	4.26			W/S/E	10	2.13	2.00	4.26		10					
11	0.80	0.60	0.48			W/S/E	11	0.80	0.60	0.48		11					
12	2.13	2.00	4.26			W/S/E	12	2.13	2.00	4.26		12					
13	1.00	1.20	1.20			W/S/E	13	1.00	1.20	1.20		13					
14	0.80	0.60	0.48			W/S/E	14	0.80	0.60	0.48		14					
15	2.13	2.00	4.26			W/S/E	15	2.13	2.00	4.26		15					
16	2.13	0.70	1.49			North	16					16	2.13	0.70	1.49	North	
17	2.13	2.72	5.79			North	17					17	2.13	2.72	5.79	North	
18	2.13	0.80	1.70			W/S/E	18	2.13	0.80	1.70		18					
19	2.13	3.22	6.85			W/S/E	19	2.13	3.22	6.85		19					
20	2.13	3.09	6.58			North	20					20	2.13	3.09	6.58	North	
21	1.80	2.40	4.32			W/S/E	21	1.80	2.40	4.32		21					
22	2.13	0.95	2.02			W/S/E	22	2.13	0.95	2.02		22					
23	0.40	1.22	0.49			W/S/E	23	0.40	1.22	0.49		23					
24	2.13	2.00	4.26			W/S/E	24	2.13	2.00	4.26		24					
25	2.13	0.80	1.70			W/S/E	25	2.13	0.80	1.70		25					
26	2.13	0.90	1.92			W/S/E	26	2.13	0.90	1.92		26					
27	2.13	0.80	1.70			W/S/E	27	2.13	0.80	1.70		27					
28	2.13	0.80	1.70			W/S/E	28	2.13	0.80	1.70		28					
29			0.00				29	0.00	0.00	0.00		29					
30			0.00				30	0.00	0.00	0.00		30					
		Sub Total	**66.85**						**Sub Total**	**49.38**				**Sub Total**	**17.47**		

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ◉
Walls ○
Roofs ○

Date: 08/02/2022

Element Name (optional) **1.90** m²°C/W

Type: Floor: Slab Floor

Slab Floor [view detail]

internal surface 0.09

Flooring : none (Example: polished surface of a concrete floor)

R-value: 0.00

Slab Insulation

Slab floor area [m²]:	165.3		
Perimeter length [m]:	101.7		
External wall thickness [mm]:	115		
Soil conductivity [W/m °C]	1.2		
Underslab insulation:	Total slab	Polystyrene EPS 100mm (H Grade)	2.78
Piles Footings:	Number:	Penetration Diameter [mm]:	
Slab edge insulation:	none	Insulation :	

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ◉
- Roofs ○

Date: 08/02/2022

Element Name (optional) **2.25** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : Metal weatherboard (corr. iron)
R-value: 0.08

Air Barrier : Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 400mm, dwangs @ 800mm

Wall Frame Area: 17.9%	*Cavity Area: 82.1%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Pink®Batts® Ultra R2.8 Wall 2.8
	still Airgap: 20-90mm airgap (non-reflective) *R-value: 0.16*

Wall Lining : Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ○
Roofs ◉

Date: 08/02/2022

Element Name (optional) **3.37** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : Corrugate iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Pink®Batts® R3.6 Ceiling 3.6

Roof Lining : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

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Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8