50 Silverton Rd, Poraiti

Slope Stability Assessment
For Claire O'Connor

PLEASE NOTE
This consent is subject to a construction monitoring

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1 Introduction

Terry & Claire O'Connor (the client) engaged WSP Opus to undertake a geotechnical assessment at 50 Silverton Rd, Poraiti (the site) legally described as LOT 1 DP 446892.

The purpose of this report is to present the results of the WSP Opus site specific geotechnical investigations and assessment and is considered suitable to support a Building Consent Application to Council.

2 Site Description

The site at 50 Silverton Road is located in an elevated position close to the summit of a ridgeline in the Poriati hills, approximately 8km west of the Napier CBD.

A near level building platform has been formed prior to the engagement of WSP Opus by a combination of cut and fill earthworks. Based on discussions with the client and their discussions with council, the fill earthworks are uncertified with no evidence of the earthworks undertaken having been documented. Preliminary determination of the extent of the cut and fill undertaken on the site has been assessed by overlaying the Napier City Council LiDAR contours (prior to earthworks) with a recent site survey undertaken by Zorn Surveying Limited (Zorn). Zorn have produced a cut and fill plan [1] which has been incorporated into the WSP Opus Site Plan (Appendix A).

The proposed building platform at the site is straddled by a moderately steep slope (slope angles typically around 35˚) to the south-west and slightly less steep slope (slope angles up to 30˚) to the north-west. Shallow gullies are present to the north-west and south sides of the site which feed into a larger gully located at the toe of the slope to the west.

3 Site Investigations

WSP Opus site investigations were undertaken between 6 August and 6 September 2018 in sunny winter conditions and involved the following:

- A desk study, site walkover and geomorphic assessment by an engineering geologist;
- 7 hand auger boreholes (HA's) to a maximum depth of 3.2m with associated hand-held shear vane (SV) readings and / or Scala Penetrometer (Scala) testing, logged in accordance with the New Zealand Geotechnical Society Guidelines; and
- 4 Scala tests within the proposed building platform area.

The HA and Scala locations are indicated on the site plan in Appendix A with logs included in Appendix B.

4 Geomorphic Assessment

The site walkover and assessment of recent and historical aerial imagery identified the following features:

- A minor (surficial) slip back scarp was identified on the mid to lower south-western slope (Appendix A);

[1] 'Cut and fill plan for proposed development at 50 Silverton Rd, Poaiti' – Ref:18FPQ-ConCF-1; Zorn Surveying Ltd; August 2018

- Minor (surficial) slips on slopes in the proximity of the site area (Figure 1); and,
- Active creep on the north, west and southern slopes.

Figure 4-1 : Geomorphology of landscape surrounding the site

There was no evidence of any large scale, deep seated failures in the proximity of the site area.

5 Geological Setting

The Institute of Geological and Nuclear Sciences (GNS) geological maps[2] indicates that the site is underlain by Neogene sedimentary rocks comprising alternating sequences of limestone, sandstone, mudstone and conglomerate.

6 Ground Model

Within the proposed building platform, the site subsoils comprise hard / medium dense to dense light brown SILT and Silty SAND within the cut. The un-engineered FILL typically comprises medium dense Silty SAND and is underlain by the same material as observed in the cut.

Typical stratigraphy on the slopes comprise TOPSOIL from the ground surface to depths of up to 0.5m below ground level (bgl) but typically around 0.2m bgl. Topsoil is underlain by a predominantly SILT unit up to 1.8m thick which typically has low plasticity and is occasionally interbedded with medium dense to dense SILT /SAND and Silty SAND layers. This unit varies slightly near the base of the south-western slope (HA11) where the soils become more Clayey which may be due to the presence of completely weathered materials from the underlying rock

2 QMAP. 1:250,000 Geological Map of New Zealand - Geology of the Hawke's Bay Area. Lee, J.M., Bland, K.J., Townsend, D.B., Kamp, P.J.J. (compilers)

and wetter conditions towards the gully areas. This unit is underlain by a hard SILT or dense Silty SAND (potentially highly weathered rock) where the HAs met refusal.

Soils were typically dry to moist within the building platform cut and fill area, predominantly moist on the north-western slope and moist to wet on the more shaded south-western slope. Soils encountered were however generally moist to wet.

Groundwater was not encountered during the investigations, although towards the base of the south-western slope in HA11 soils were observed to be reaching saturation just above the hard (possibly weathered rock) soil unit at a depth of around 0.4m to 0.5m bgl. This is inferred to be indicative of a perched water table within the higher permeability soils overlying lower permeability materials.

The ground model for the surface subsoils within the proposed building platform area is summarised in Table 6-1. Geological cross sections through the north-western and south-western slopes have been developed for stability modelling and are provided in Figures 6.1 & 6.2 respectively.

Table 6-1 : General Ground Profile within the Proposed Building Platform Area

Unit	Soil description	Depths to top of unit (range in m bgl from/ to)	Unit thicknesses (range in m from/ to)
1	FILL (Silty SAND)	0.0*	0.1 – 2.0*
2	Sandy SILT with some Silty SAND layers, stiff to very stiff, moist	0.0 – 2.0	0.6 – 1.8
3	SILT / Silty SAND, hard to dense, moist	1.0 – 2.0	N/A

**Fill depths and thicknesses only apply to the proposed building platform area.*

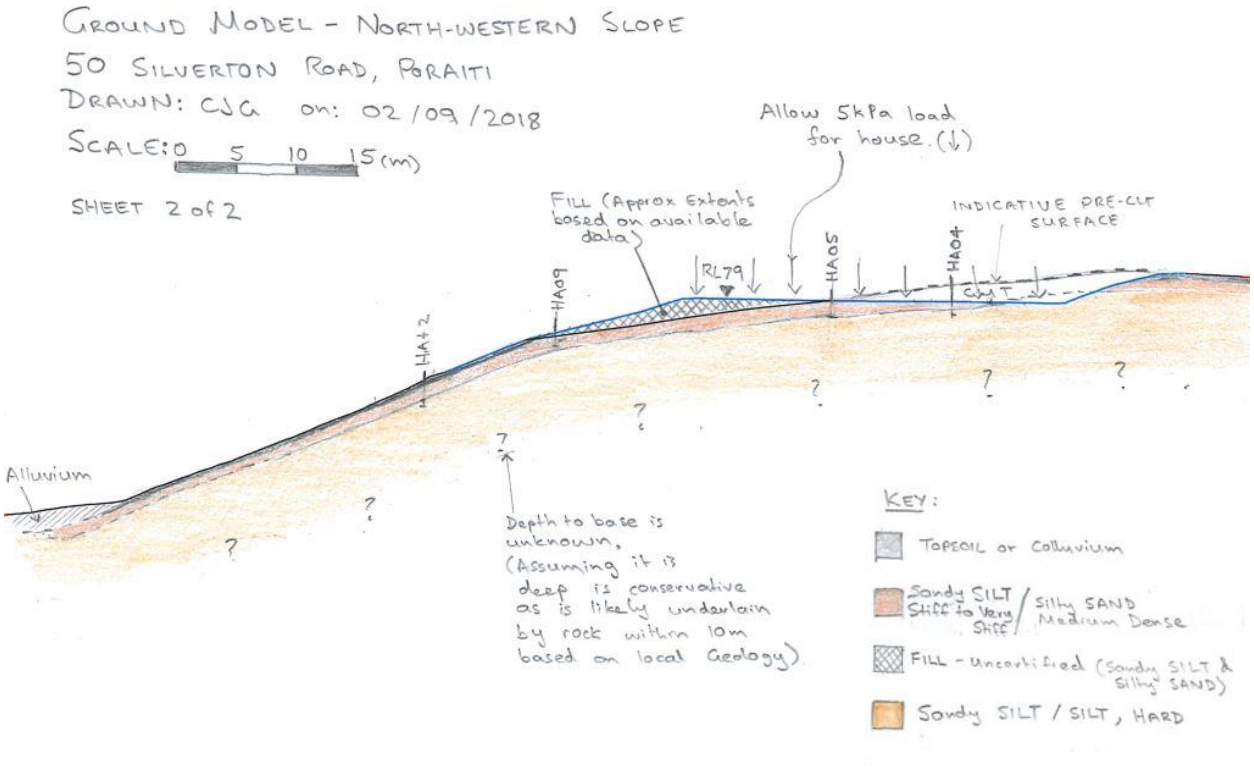


Figure 6-1 : Geological Cross Section through the North-Western Slope

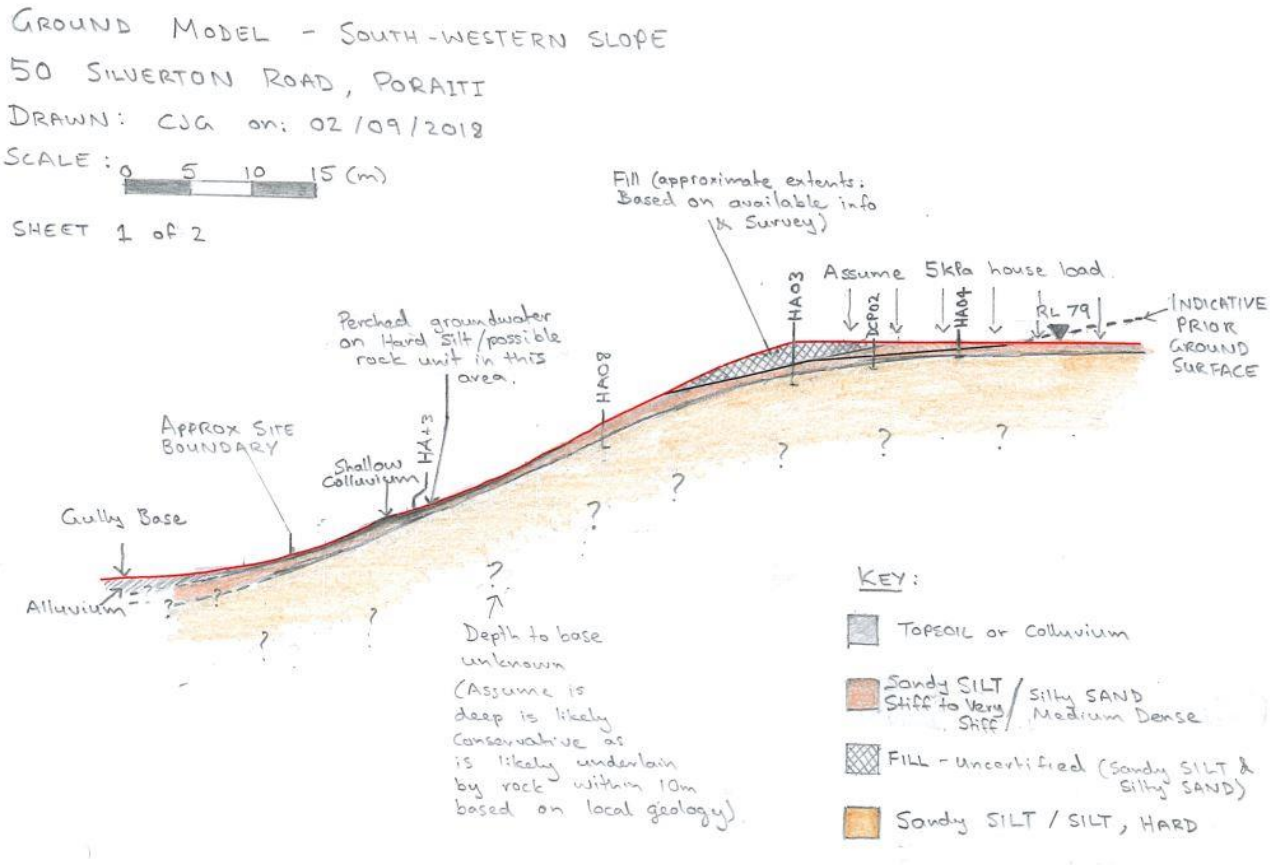


Figure 6-2 : Geological Cross Section through the South-Western Slope

7 Geotechnical Model

Geotechnical soil properties (Table 7-1) for the various materials described in the geological ground model and geological sections have been assessed based on the in-situ strength testing in combination with visual/tactile assessments of soil samples taken and inferred values from local experience with similar soils.

Table 7-1 : Assessed Geotechnical Parameters for the Site Soils

Unit	Soil Description	Inferred Geotechnical Parameters				
		Effective Cohesion c' (kPa)	Effective Phi - Ø' (degrees)	Bulk Unit Weight γ (kN/m^3)	Undrained Shear Strength (kPa)	Pore Pressure Ratio (R_u)*
-	TOPSOIL/ Colluvium / Alluvium	2	26	17.5	50	$0^{(1)}$ / $0.3^{(2)}$
1	FILL (Silty SAND)	0	28	17.5	N/A	$0^{(1)}$ / $0.3^{(2)}$
2	Sandy SILT with some Silty SAND layers, stiff to very stiff, moist	0	28	17.5	50	$0.1^{(1)}$ / $0.3^{(2)}$
3	Sandy SILT / Silty SAND, hard to dense, moist	4	30	18.5	150	$0^{(1)}$ / $0.3^{(2)}$

** - Pore pressure ratios for prevailing (long term gwl) conditions (1) and short term (higher gwl) conditions (2).*

It should be noted that the pore pressure ratio of 0.1 under prevailing (long term) conditions in the Sandy SILT (Unit 2) has been adopted to account for the wet to nearly saturated conditions at the interface between the overlying soils and the hard soil unit (possibly rock). The slight increase in pore pressure ratio adopted will model the slight strength reduction expected in the soils at this boundary.

8 Slope Stability Assessment

The slope stability assessments completed by WSP Opus has focused on the steeper south-western and north-western slopes. The analysis has made use of the geological cross sections detailed in Section 6 and the assessed engineering properties of the soils detailed in Section 7.

8.1 Modelling Methodology

8.1.1 Software and Analysis Method

The slope stability assessment was undertaken using proprietary software Slide 7 and the GLE / Morgenstern-Price analysis method.

8.1.2 Failure Mechanisms and Scenarios

We have assessed potential failure mechanisms based on field investigations and a desktop study which has identified the typical, but limited failure mechanisms as being typically rotational.

Three slope stability scenarios were assessed for the slope as shown in Figure 9 as follows:

- *Long term / prevailing conditions;*
- *Short term / elevated pore pressures (storm events); and*
- *Seismic events - Ultimate Limit State (ULS).*

8.1.3 Seismic Peak Ground Acceleration

A design earthquake peak ground acceleration (PGA) was calculated for the Seismic ULS case according to MBIE Guidelines Module 1: Section 5 – Estimating Ground Motion Parameters. The following design assumptions have been adopted:

- *Site Soil Class of "C" (Shallow Soil) based on NZS1170.5:2004;*
- *Importance Level 2 based on Table 3.2 of AS/NZS1170.0:2002; and*
- *50-year Building Design Life;*

The resulting design earthquake PGA is 0.41g.

8.1.4 Required Factors of Safety

The required minimum Factor of Safety (FoS) for each slope stability assessment scenario is given in Table 8-1.

Table 8-1 : Slope Stability – Required Minimum Factors of Safety

Scenario	Minimum required FoS
Prevailing Conditions (Long Term)	1.5
Elevated Pore Pressures (Short Term)	1.2
Seismic (ULS)	1.0

8.2 Results

The resulting FoS for surfaces encroaching on the proposed building platform for the north-western and south-western slopes are provided in Tables 8-2 and 8-3 respectively. The Slope Stability Outputs are provided in Appendix C.

Table 8-2 : Slope Stability – Minimum Resulting Factors of Safety (North-Western Slope)

Scenario	Assessed minimum FoS for slip circles extending into the building platform area	Minimum set back distance from downslope crest extending into the building platform area to satisfy minimum required FoS
Prevailing Conditions (Long Term)	> 1.5	N/A
Elevated Pore Pressures (Short Term)	> 1.2	N/A
Seismic (ULS)	0.94	4.5m

Table 8-3 : Slope Stability – Minimum Resulting Factors of Safety (South-Western Slope)

Scenario	Assessed minimum FoS for slip circles extending into the building platform area	Minimum set back distance from downslope crest extending into the building platform area to satisfy minimum required FoS
Prevailing Conditions (Long Term)	1.41	3.7m
Elevated Pore Pressures (Short Term)	1.13	4.0m
Seismic (ULS)	0.88	5.8m

The findings from the slope stability analysis indicate that the seismic scenario is the critical case for design. In order to prevent potential slip circles from encroaching into the building platform area and affecting any structures, a setback for buildings from the slope crests is required. Based on the analysis, it is recommended that any structure be set back a minimum distance of 5.0m from the north-western slope crest and 6.0m from the south-western slope crest as indicated on the Site Plan (Appendix A). If any part of the structure is required to extend beyond the building set back line then this will require 'specific engineering design' undertaken by suitably qualified professionals.

9 Bearing Capacity

The results of the subsurface investigations indicate that "Good Ground" in accordance with NZS3604:2011 (i.e. having a static geotechnical ultimate bearing capacity of 300kPa) is generally available within the natural soils at a minimum depth of 0.3m bgl.

The filling that has previously been undertaken on the site is uncertified and hence is unsuitable for use as a foundation formation. Any structure constructed over the filled area will require specific engineer designed' foundations by a suitably qualified engineer. Such foundations could comprise piles extending through the fill located within the natural soils below or alternatively foundations constructed extending into underlying in-situ materials assessed as satisfying the requirements for 'good ground' in accordance with NZS3604:2011.

10 Waste Water

Based on discussions with the client it is understood that waste water will be dealt with using an onsite waste disposal system. At present no details of the system has been provided, however these systems generally require a disposal field with adequate soakage. The most suitable area of the site for the location of a disposal field has been identified as being the flatter part of the western ridge as indicated on the Site Plan (Appendix A). This site has been chosen as it is north facing, has the least gradient, is underlain by natural soils and hence presents the area with the lowest risk of effluent from a septic tank affecting the stability of the slope. Care should be taken to ensure that the disposal field is located to the northern side of the ridge to avoid the potential for effluent to migrate onto the south-western slope. Based on the limited site investigations undertaken, it is assessed that the soils present will be 'Class 3' in accordance with AS/NZS 1547:2012. Soakage testing should be undertaken as part of the detailed design for such systems.

11 Storm Water

A storm water attenuation system will be required to ensure that post development storm water runoff rates do not exceed those for pre-development of the site. Based on discussions with the client, it is understood that rain water storage tanks will be required for domestic water usage. The rain tanks conventionally allow for extra storage to attenuate the design storm with a low flow orifice that would discharge water at a rate less than or equal to pre-development levels. The design of the rain tanks to attenuate post-development flows is outside this commission however can be undertaken by WSP Opus if required.

It is proposed that storm water runoff from the site will be collected and discharged into the swale drain of a local road situated to the north of the site, as indicated on the Site Plan (Appendix A). It should be confirmed that this is a suitable option with the relevant council. Any pre-existing overland flows resulting from storm water, surface water and ground water run-off and not related to the development will not be collected and allowed to disperse naturally.

12 Summary & Recommendations

A summary of findings and recommendations from the work undertaken is detailed below:

- All structures within the building platform area to be constructed a minimum distance of 5.0m from the crest of the north-western slope and 6.0m from the crest of the south-western slope as indicated by the building set-back line on the Site Plan (Appendix A). Any part of a structure located outside the building set-back line will require 'specific engineer designed' foundations to be undertaken by suitably qualified engineers.
- Structures should be founded within the natural soils (Sandy SILT / Silty SAND) which typically have a static geotechnical ultimate bearing capacity of 300kPa (100kPa allowable).
- The filling that has previously been undertaken on the site is uncertified and hence is unsuitable for use as a foundation formation. Any structure constructed over the filled area will require 'specific engineer designed' foundations by a suitably qualified engineer. Such foundations could comprise piles extending through the fill located within the natural soils below or alternatively foundations constructed extending into underlying in-situ materials assessed as satisfying the requirements for 'good ground' in accordance with NZS3604:2011.
- The most suitable area of the site for the location of a disposal field has been identified as being the flatter part of the western ridge as indicated on the Site Plan (Appendix A). This

site has been chosen as it is north facing, has the least gradient, is underlain by natural soils and hence presents the area with the lowest risk of effluent from a septic tank affecting the stability of the slope. Care should be taken to ensure that the disposal field is located to the northern side of the ridge to avoid the potential for effluent to migrate onto the south-western slope. No effluent disposal should be allowed to discharge into the un-engineered fill. Based on the limited site investigations undertaken, it is assessed that the soils present will be 'Soil Class 3' in accordance with AS/NZS 1547:2012. For detailed design, it is recommended that soakage testing be undertaken due to the variability of the near surface soils.

- Due to potential increased risks to slope instability, disposal of storm water by soakage to ground is not recommended. A storm water attenuation system will therefore be required to ensure that post development storm water runoff rates do not exceed those for pre-development of the site. Based on discussions with the client, it is understood that rain water storage tanks will be required for domestic water usage. The rain tanks conventionally allow for extra storage to attenuate the design storm with a low flow orifice that would discharge water at a rate less than or equal to pre-development levels.
- The topsoil stockpile on site should be removed or used within any landscaping required of the building platform surrounding the proposed dwelling. It should not be spread over any existing topsoil or sloping ground.

The recommendations included within this report are considered by WSP Opus to be suitable at this site for the purposes stated. Alternative options may be suitable provided they are designed by an appropriate engineering professional and consider the information and analysis in this report.

13 Limitations

The factual data, interpretations and recommendations contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site.

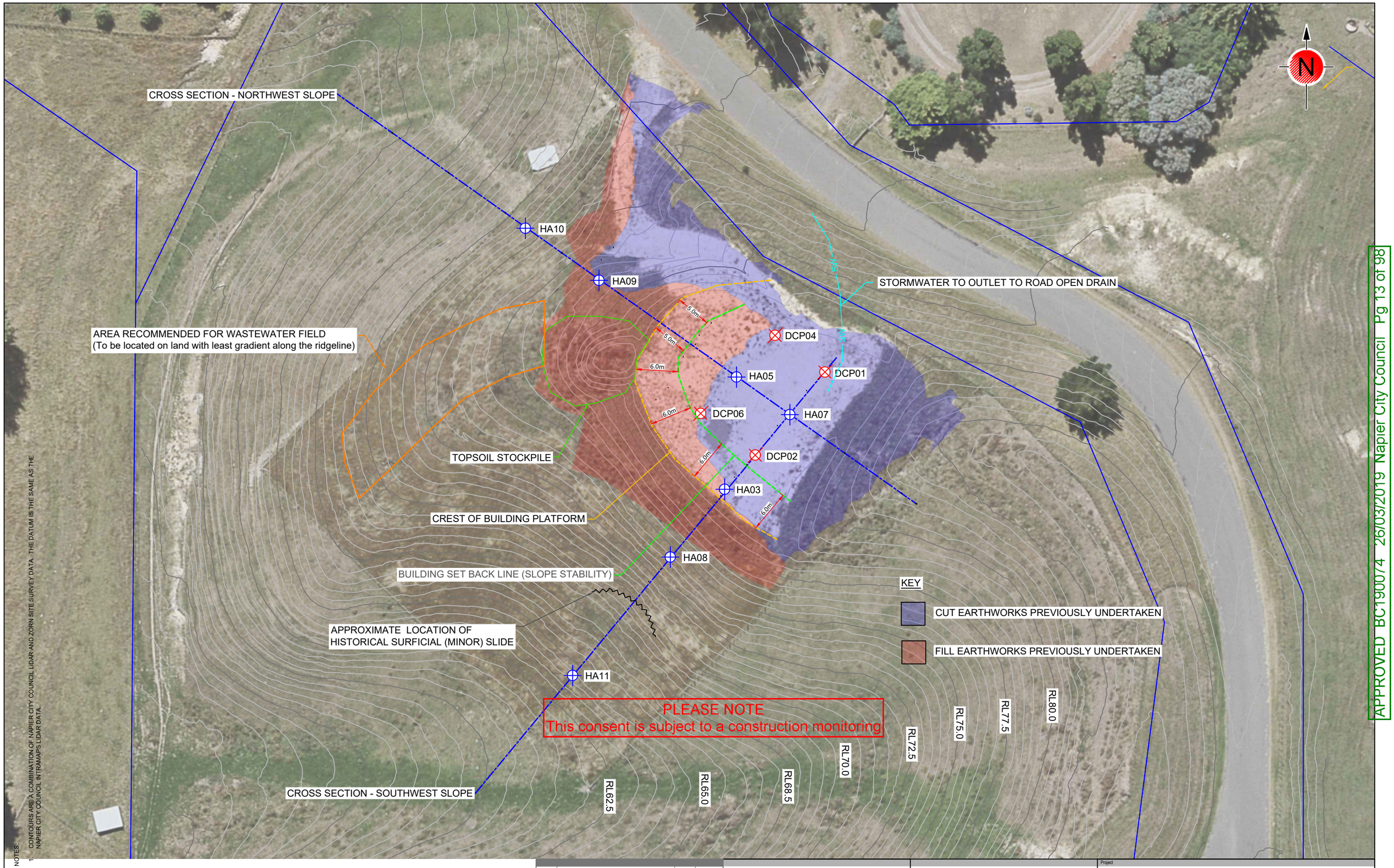
If the project is modified in any significant way, or if the project is not initiated within eighteen months of the date of the report, WSP Opus should be given an opportunity to confirm that the recommendations are still valid.

Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that WSP Opus be notified of the changes and provided with an opportunity to review the recommendations of this report.

Recognition of changed soil conditions requires experience and is recommended that an experienced geotechnical engineer be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Appendix A

WSP Opus Site Plan



APPROVED BC190074 26/03/2019 Napier City Council Pg 13 of 98

150 mm
100
50
25
5 mm
0

NOTES:
1. CONTOURS ARE A COMBINATION OF NAPIER CITY COUNCIL LIDAR AND ZORN SITE SURVEY DATA. THE DATUM IS THE SAME AS THE NAPIER CITY COUNCIL INTRAMAPS LIDAR DATA.

1:500 @ A1
1:1000 @ A3
0 5 10 15 20 25 30 35 40 45 50 m

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Private Bag 6019
Napier 4142
New Zealand

Designed	Approved	Approved Date
C GOSS		
Drawn	**Scales**	
C WHITWORTH	1:250 [A1] 1:500 [A3]	

Project
CLAIRE O'CONNOR
50 SILVERTON RD, PORAITI
SITE PLAN

Sheet
SITE PLAN

Project No.	Sheet. No.	Revision
2-S5361.00	01	1

Original Sheet Size A1 [841x594] Plot Date 2018-09-11 at 11:21:53 AM Path S:\Proj\NZ\2S\2-S5361.00 O'Connor-50 Silverton Rd Poraiti, Napier\Home\00001 Walkover and Letter\02 Plans\CAD\2-S5361.00 O'Connor-50 Silverton Rd Poraiti.dwg 01

Appendix B

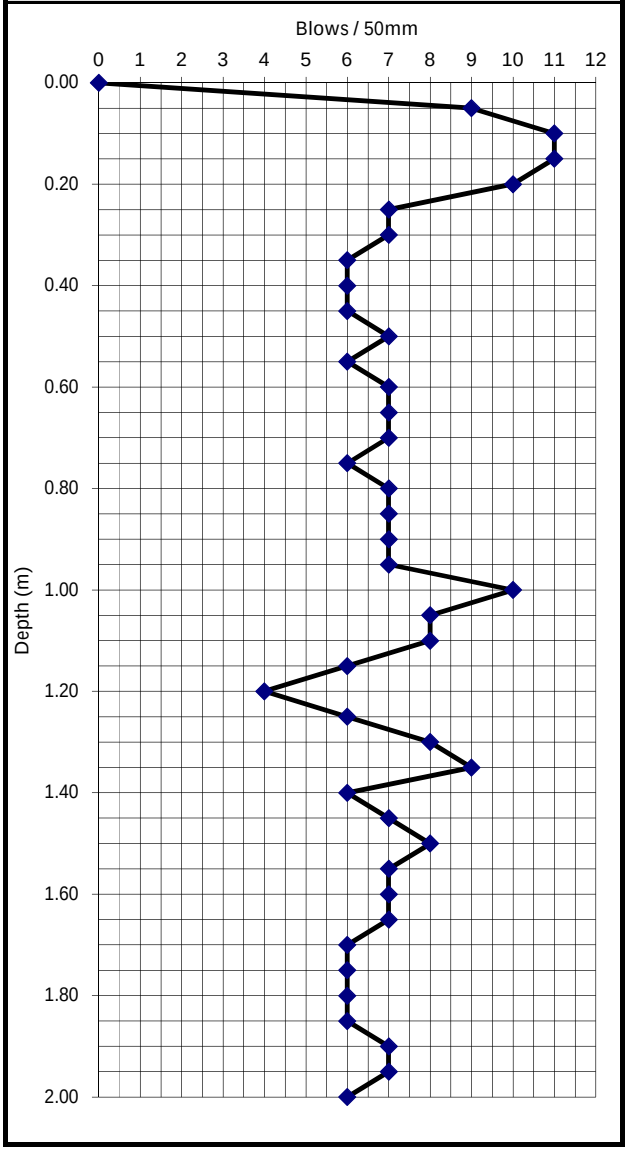
Auger & Scala Penetrometer Test Results

SCALA PENETROMETER TEST REPORT

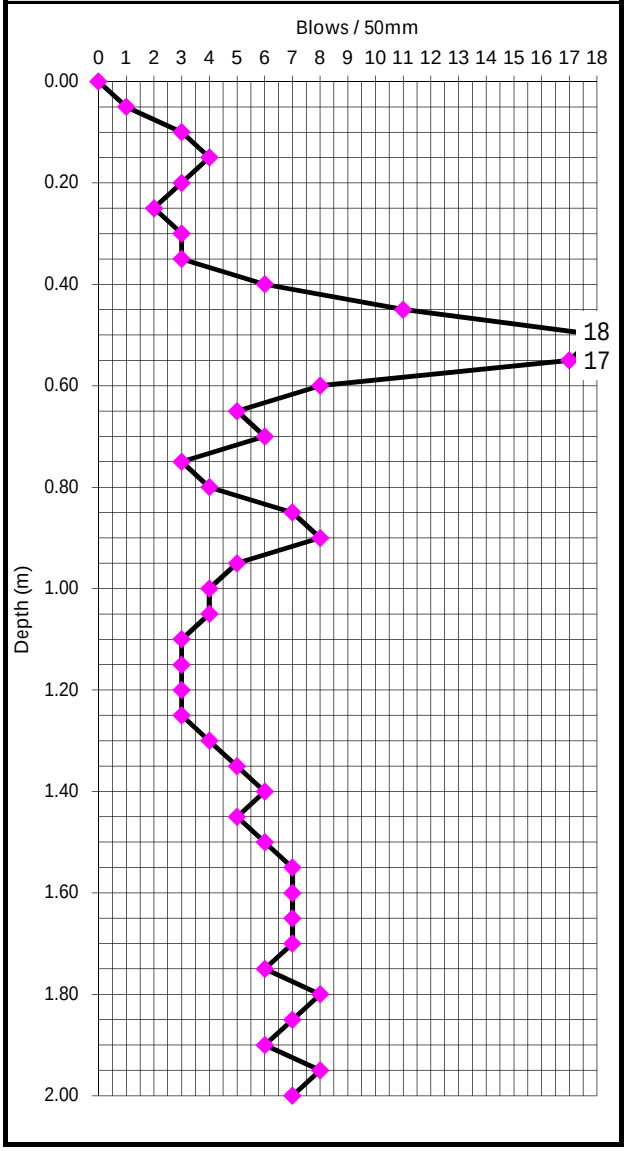
Project :	Proposed Residential Dwelling
Location :	50 Silverton Road, Poraiti
Client :	Claire O'Connor
Tested By :	CW & RF
Test number :	1 & 2
Water level (m):	Not Encountered
Reduced level (m):	Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Scala Penetrometer 1



Scala Penetrometer 2



Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

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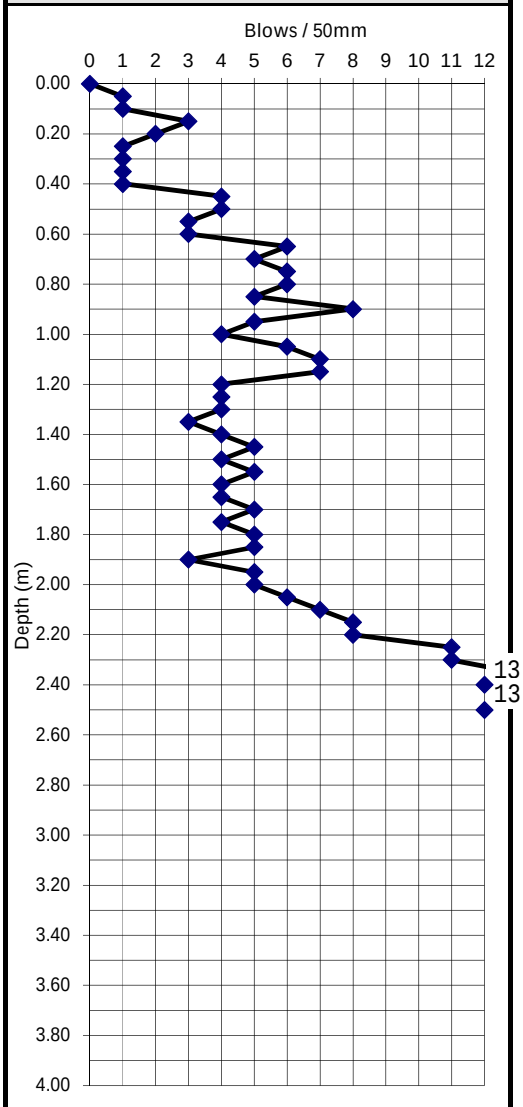
AUGER / SCALA TEST REPORT

WSP | OPUS

Project :	Proposed Residential Dwelling
Location :	50 Silverton Road, Poraiti
Client :	Claire O'Connor
Tested By :	CW & RF
Test number :	3
Water level (m):	Not Encountered
Reduced level (m):	Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Scala Penetrometer 3



Test Results

Depth (m)	Soil Description
0.00	Light brown Sandy SILT, moist, non plastic, stiff, minor gravel
1.50	
	Light brown Silty SAND, moist, medium to coarse grained
2.00	
	SILT with minor sand, moist, low plasticity, sand is pumecious, slight cohesion
3.20	
	End of HA - Unable to auger through dense soils

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

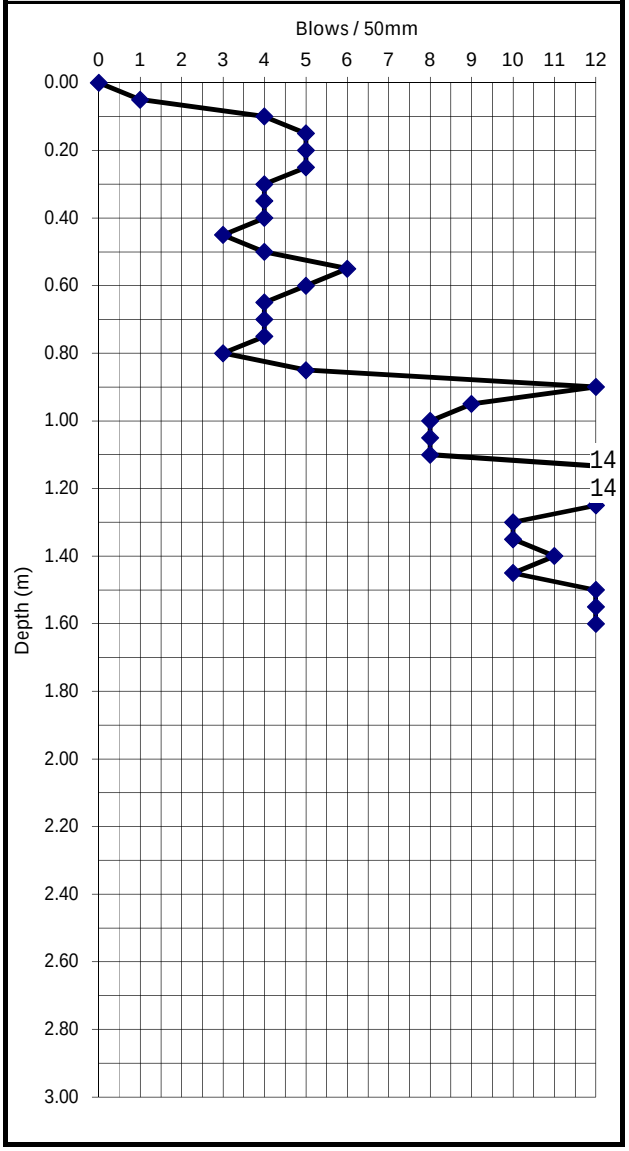
Date tested : 24/08/2018
Date reported : 27/08/2018

SCALA PENETROMETER TEST REPORT

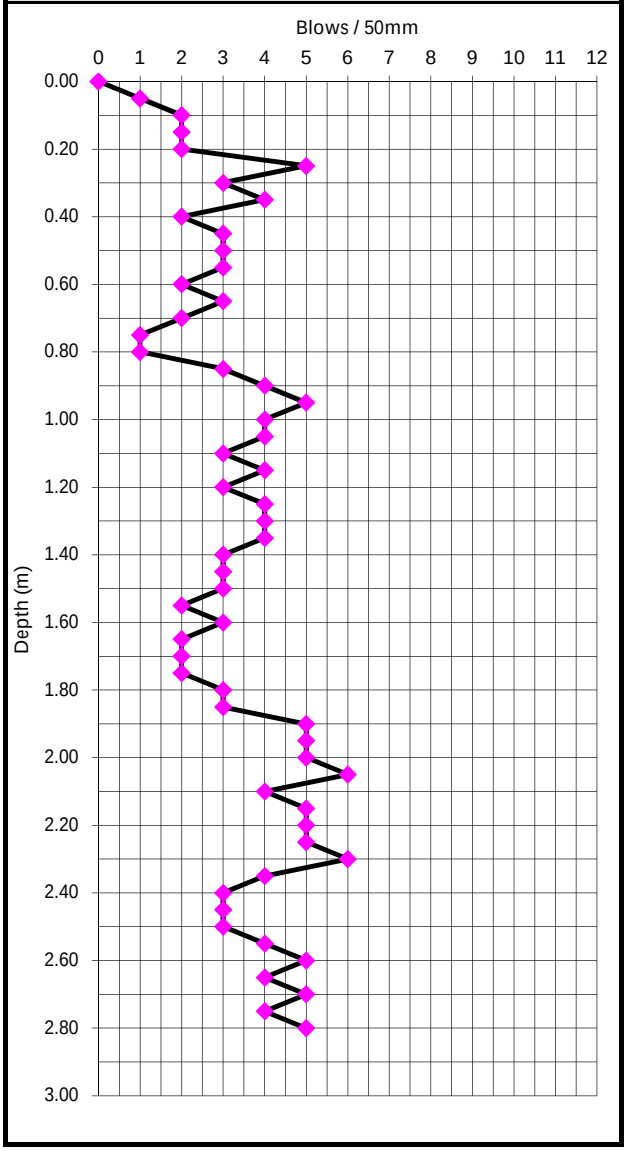
Project :	Proposed Residential Dwelling
Location :	50 Silverton Road, Poraiti
Client :	Claire O'Connor
Tested By :	CW & RF
Test number :	4 & 6
Water level (m):	Not Encountered
Reduced level (m):	Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Scala Penetrometer 4



Scala Penetrometer 6



Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

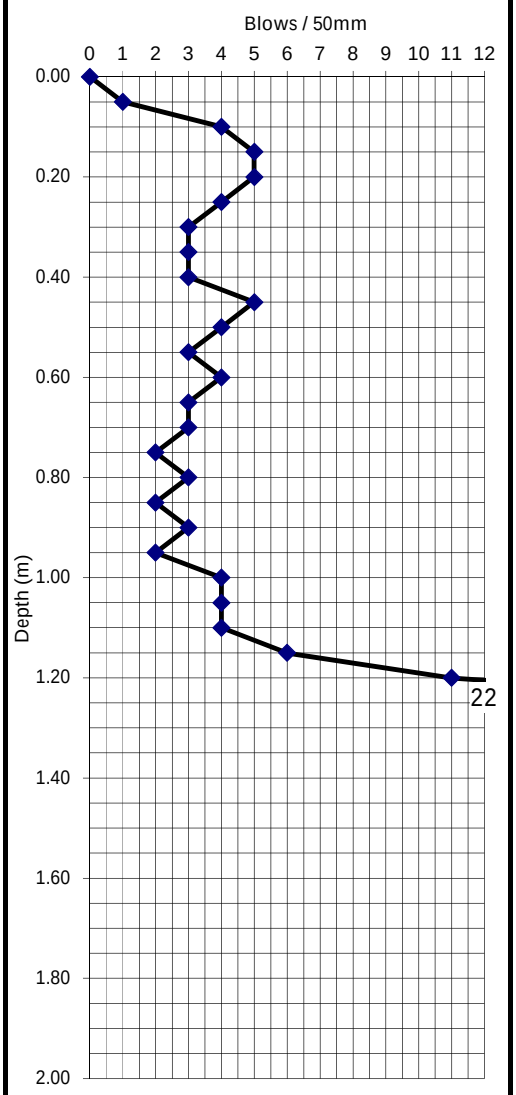
Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

Project :	Proposed Residential Dwelling
Location :	50 Silverton Road, Poraiti
Client :	Claire O'Connor
Tested By :	CW & RF
Test number :	5
Water level (m):	Not Encountered
Reduced level (m):	Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Scala Penetrometer 5



Test Results

Depth (m)	Soil Description
0.00	Brown Sandy SILT, dry, non plastic VSS @ 0.3m = UTP
0.70	VSS = 0.7m = UTP
0.90	Dark brown Sandy SILT, dry, stiff - very stiff
1.20	Dark brown/orange/light brown Sandy SILT mix, dry, non plastic, hard
	End of HA at 1.2m in dense soils

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

WSP | OPUS

Project : Proposed Residential Dwelling
Location : 50 Silverton Road, Poraiti
Client : Claire O'Connor
Tested By : CW & RF
Test number : 7
Water level (m): Not Encountered
Reduced level (m): Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Test Results

Depth (m)	Soil Description
0.00 0.20	Light brown SILT, dry, non plastic
  >0.6	Light brown Silty SAND, dry, non plastic

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

WSP | OPUS

Project : Proposed Residential Dwelling
Location : 50 Silverton Road, Poraiti
Client : Claire O'Connor
Tested By : CW & RF
Test number : 8
Water level (m): Not Encountered
Reduced level (m): Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Test Results

Depth (m)	Soil Description
0.00	TOPSOIL
0.50	
	Brown Sandy SILT, dry, non plastic
1.00	
	Hard SILT with minor sand.
1.20	
	Unable to auger past 1.2m

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

WSP | OPUS

Project : Proposed Residential Dwelling
Location : 50 Silverton Road, Poraiti
Client : Claire O'Connor
Tested By : CW & RF
Test number : 9
Water level (m): Not Encountered
Reduced level (m): Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Test Results

Depth (m)	Soil Description
0.00 0.15	TOPSOIL
0.35	Light Brown Silty SAND, dry, dense ,fine grained VSS @ 0.3m = 122/77kPa
1.00	Orange brown Sandy SILT, dry, non plastic VSS @ 0.8m = 162/57kPa
2.00	Whiteish brown Silty SAND/Sandy SILT (slight cohesion), moist, dense, fine to coarse grained, non plastic VSS @ 1.6m = 100/28kPa VSS @ 1.9m = 85/31kPa
2.20	Fine to coarse grained pumiceous SAND with some silt, dense, moist becoming wet at 2.2m
2.50	Silty SAND, dense

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

WSP | OPUS

Project : Proposed Residential Dwelling
Location : 50 Silverton Road, Poraiti
Client : Claire O'Connor
Tested By : CW & RF
Test number : 10
Water level (m): Not Encountered
Reduced level (m): Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Test Results

Depth (m)	Soil Description
0.00	TOPSOIL
0.40	
	Greyish brown SILT, moist, low plasticity
	VSS @ 0.5m = 54/14kPa
0.70	as above but becoming wet, high plasticity & brown VSS @ 0.8m = 85/17kPa
	VSS @ 1.0m = 83/17kPa
1.10	
	Greyish brown SILT with minor sand, high plasticity, sand is pumiceous & fine grained, moist to wet
	VSS @ 1.3m = 171/23kPa
	VSS @1.6m = UTP
1.60	as above but hard and moist VSS = UTP
1.80	EOBH - unable to auger through hard silt (refusal)\

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

AUGER / SCALA TEST REPORT

WSP | OPUS

Project : Proposed Residential Dwelling
Location : 50 Silverton Road, Poraiti
Client : Claire O'Connor
Tested By : CW & RF
Test number : 11
Water level (m): Not Encountered
Reduced level (m): Existing Ground Level

Project No :	2-S5361.00
Client Ref No :	00002

Test Results

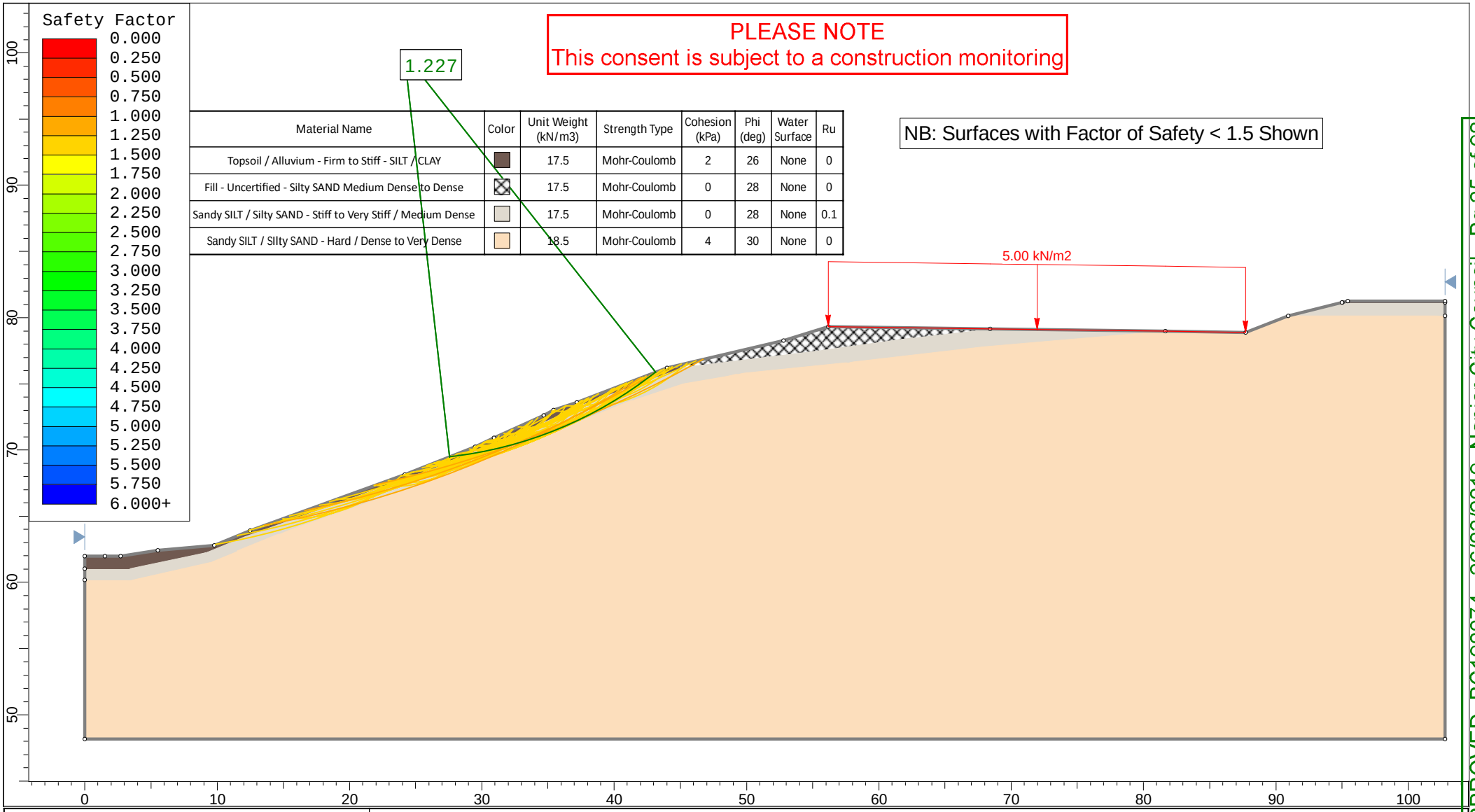
Depth (m)	Soil Description
0.00 0.20	TOPSOIL
  0.40	Greyish brown Clayey SILT, high plasticity, moist to wet VSS @ 0.4m = 68/23kPa
   0.80	CLAY with some silt, saturated (perched watertable ontop of rock likely) VSS @ 0.5m = 128/23kPa
> 0.80	Dense Silty SAND or highly weathered silt/sand stone

Test Methods	Notes
Determination of Penetration Resistance of a Soil, NZS 4402 : 1988, Test 6.5.2	

Date tested : 24/08/2018
Date reported : 27/08/2018

Appendix C

Slope Stability Outputs



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Mohr-Coulomb	2	26	None	0
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28	None	0
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Mohr-Coulomb	0	28	None	0.1
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Mohr-Coulomb	4	30	None	0

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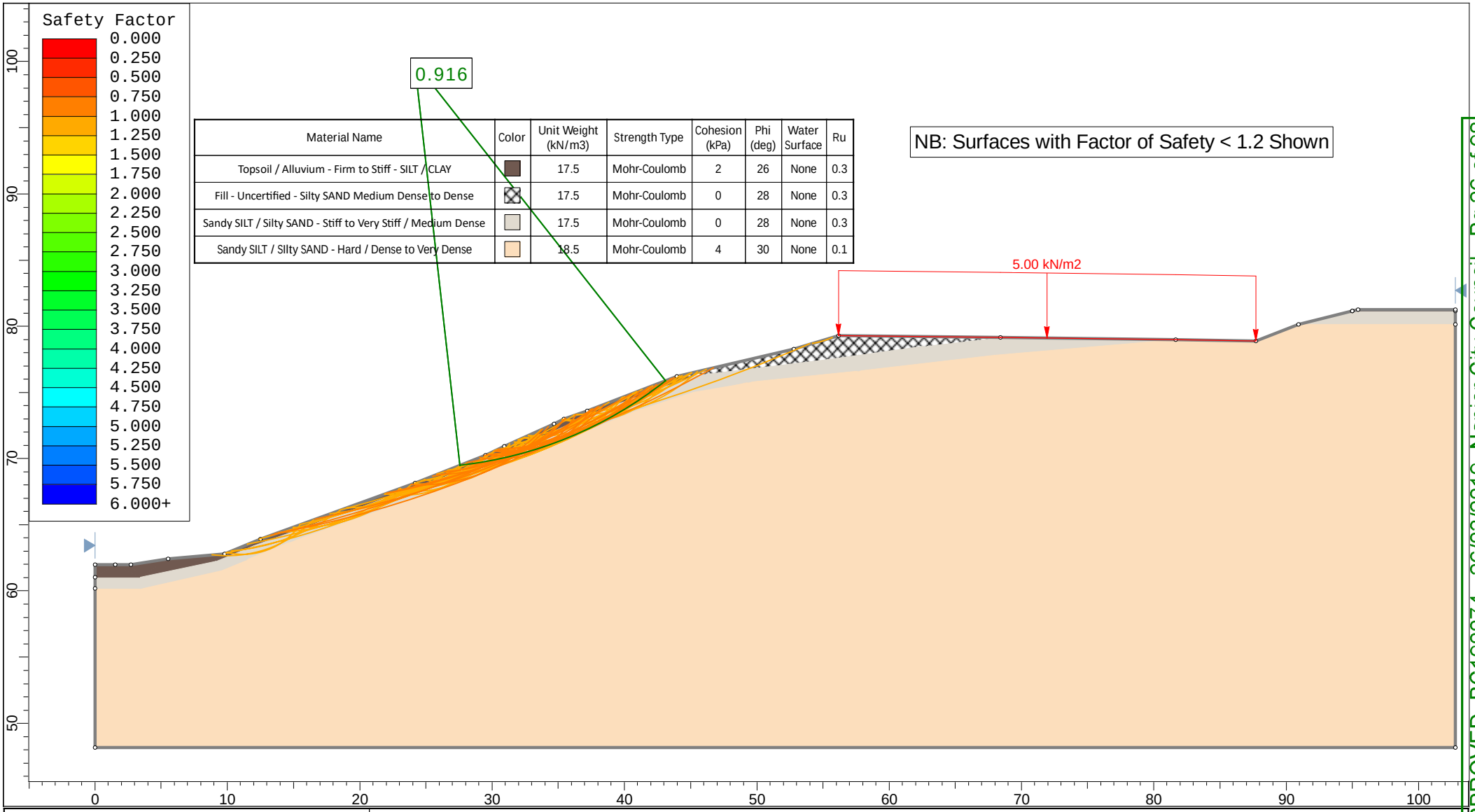
WSP | OPUS

SLIDEINTERPRET 8.016

Project	50 Silverton Road Poraiti			
Analysis Description	North-West Slope - Prevailing Conditions			
Drawn By	Chris Goss	*Scale*	1:400	*Company* WSP OPUS
Date	6/09/2018			*File Name* NW Slope - Prevailing.slmd



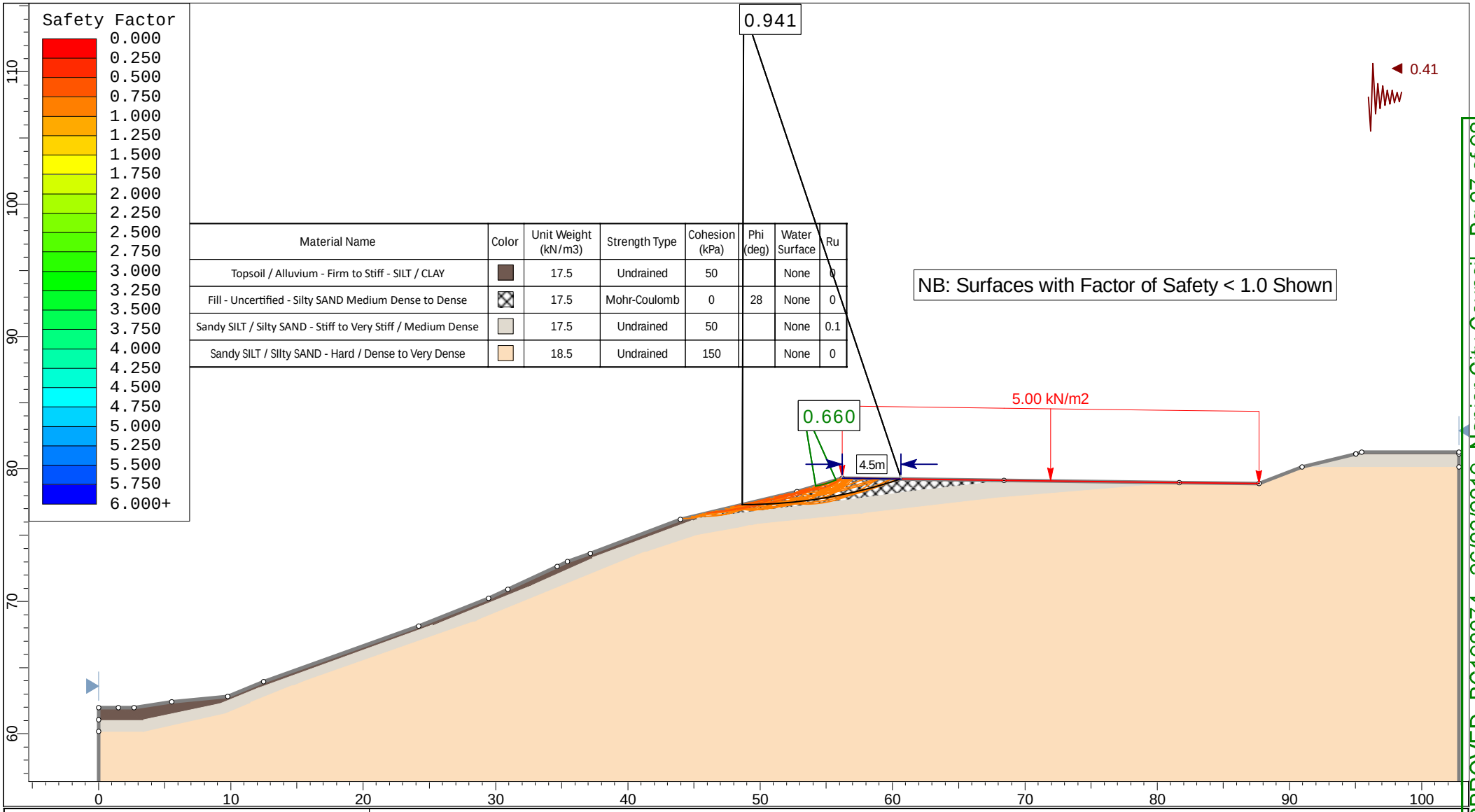
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Mohr-Coulomb	2	26	None	0.3
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28	None	0.3
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Mohr-Coulomb	0	28	None	0.3
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Mohr-Coulomb	4	30	None	0.1

NB: Surfaces with Factor of Safety < 1.2 Shown

WSP | OPUS

SLIDEINTERPRET 8.016

Project	50 Silverton Road Poraiti			
Analysis Description	North-West Slope - Short Term - Elevated Pore Pressures			
Drawn By	Chris Goss	Scale	1:400	Company WSP OPUS
Date	6/09/2018			File Name NW Slope - Elevated Pore Pressures.slmd

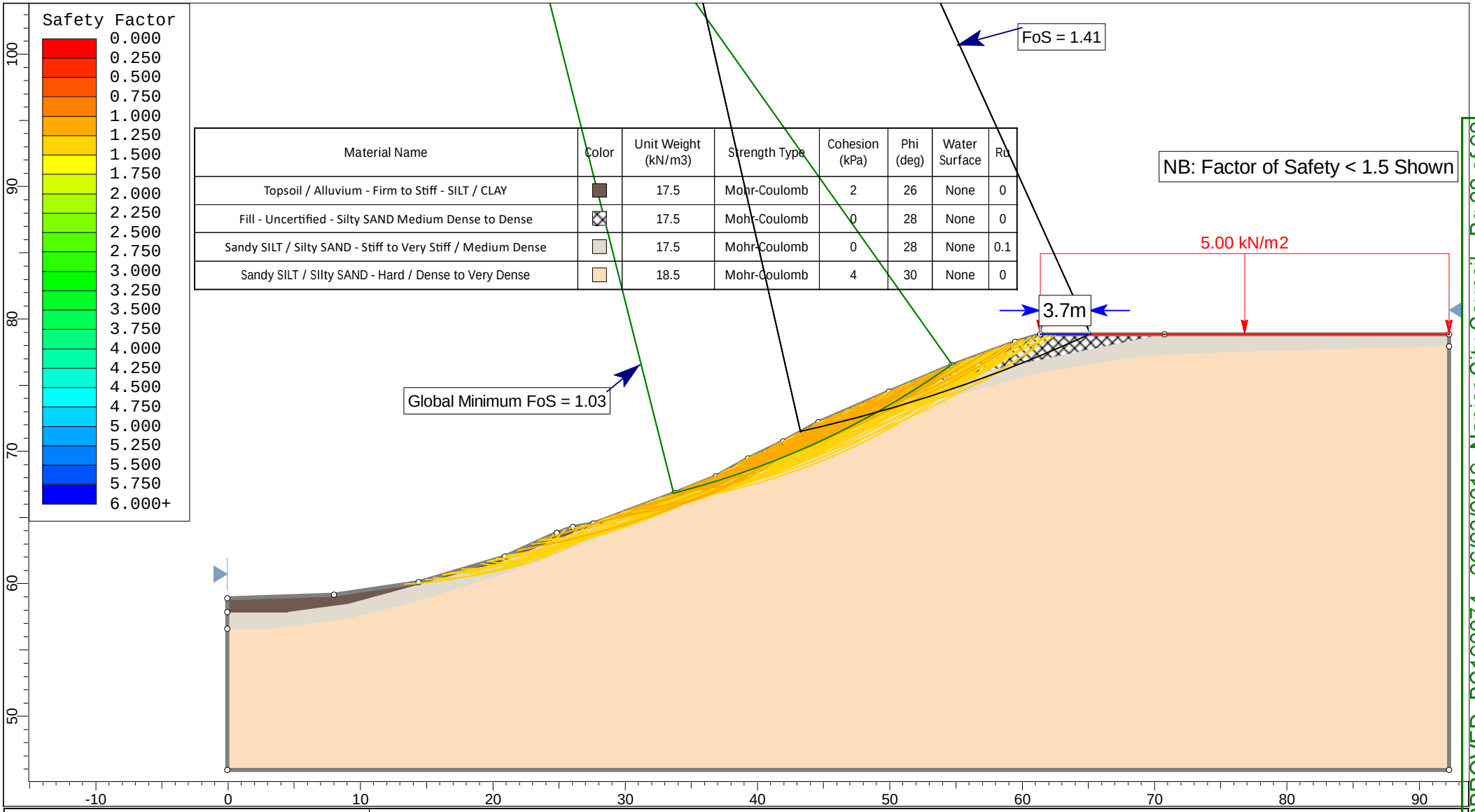


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Undrained	50		None	0
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28	None	0
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Undrained	50		None	0.1
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Undrained	150		None	0

WSP | OPUS

SLIDEINTERPRET 8.016

Project	50 Silverton Road Poraiti				
Analysis Description	North-West Slope - Seismic - ULS				
Drawn By	Chris Goss	*Scale*	1:400	*Company*	WSP OPUS
Date	6/09/2018			*File Name*	NW Slope - Seismic - ULS.slmd

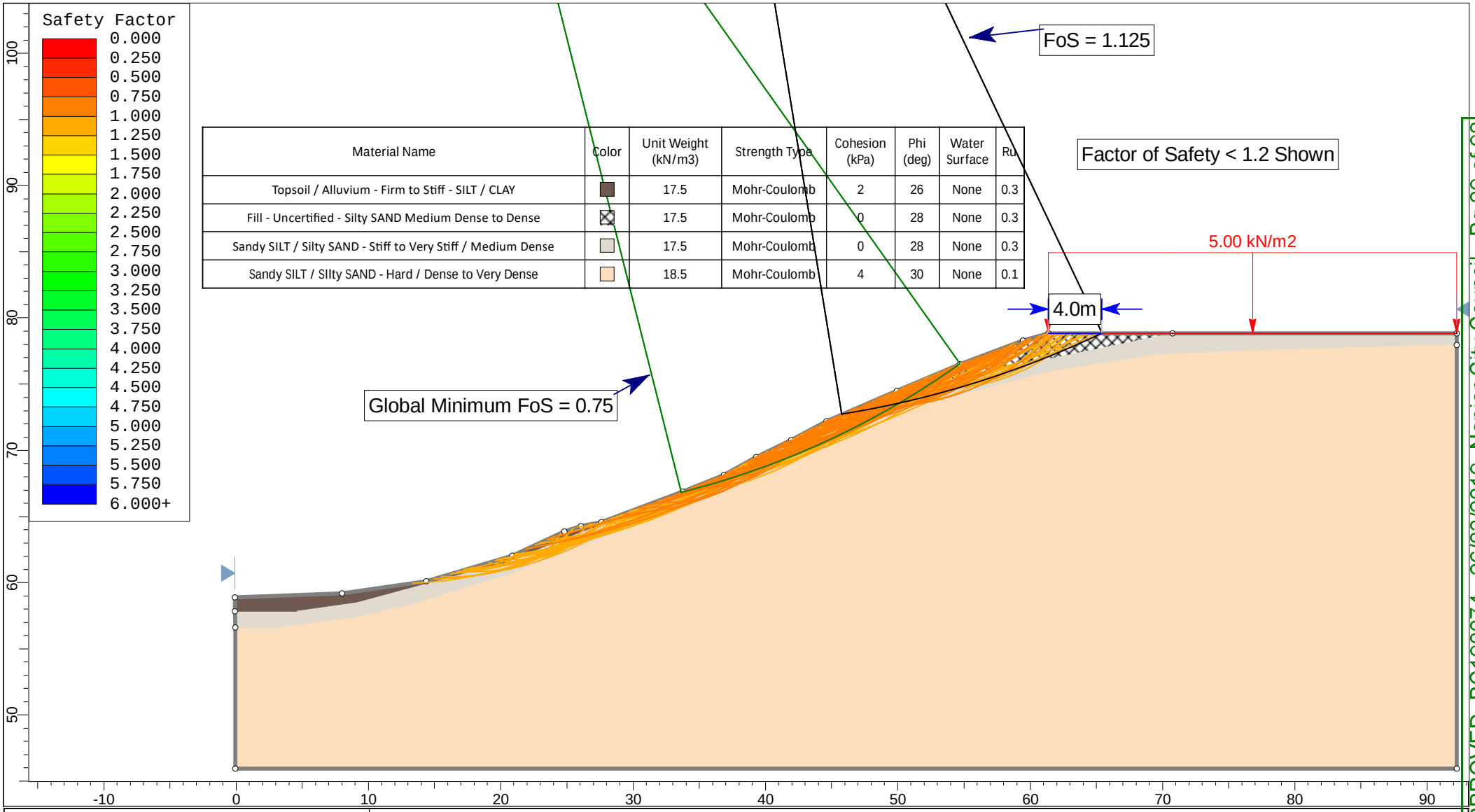


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Mohr-Coulomb	2	26	None	0
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28	None	0
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Mohr-Coulomb	0	28	None	0.1
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Mohr-Coulomb	4	30	None	0

WSP | OPUS

SLIDEINTERPRET 8.016

Project	50 Silverton Road		
Analysis Description	South-West Slope - Prevailing Conditions		
Drawn By	Chris Goss	Scale	1:400
Company	WSP OPUS		
Date	6/09/2018	File Name	SW Slope - Prevailing.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Mohr-Coulomb	2	26	None	0.3
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28	None	0.3
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Mohr-Coulomb	0	28	None	0.3
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Mohr-Coulomb	4	30	None	0.1

APPROVED BC190074 26/03/2019 Napier City Council Pg 29 of 98

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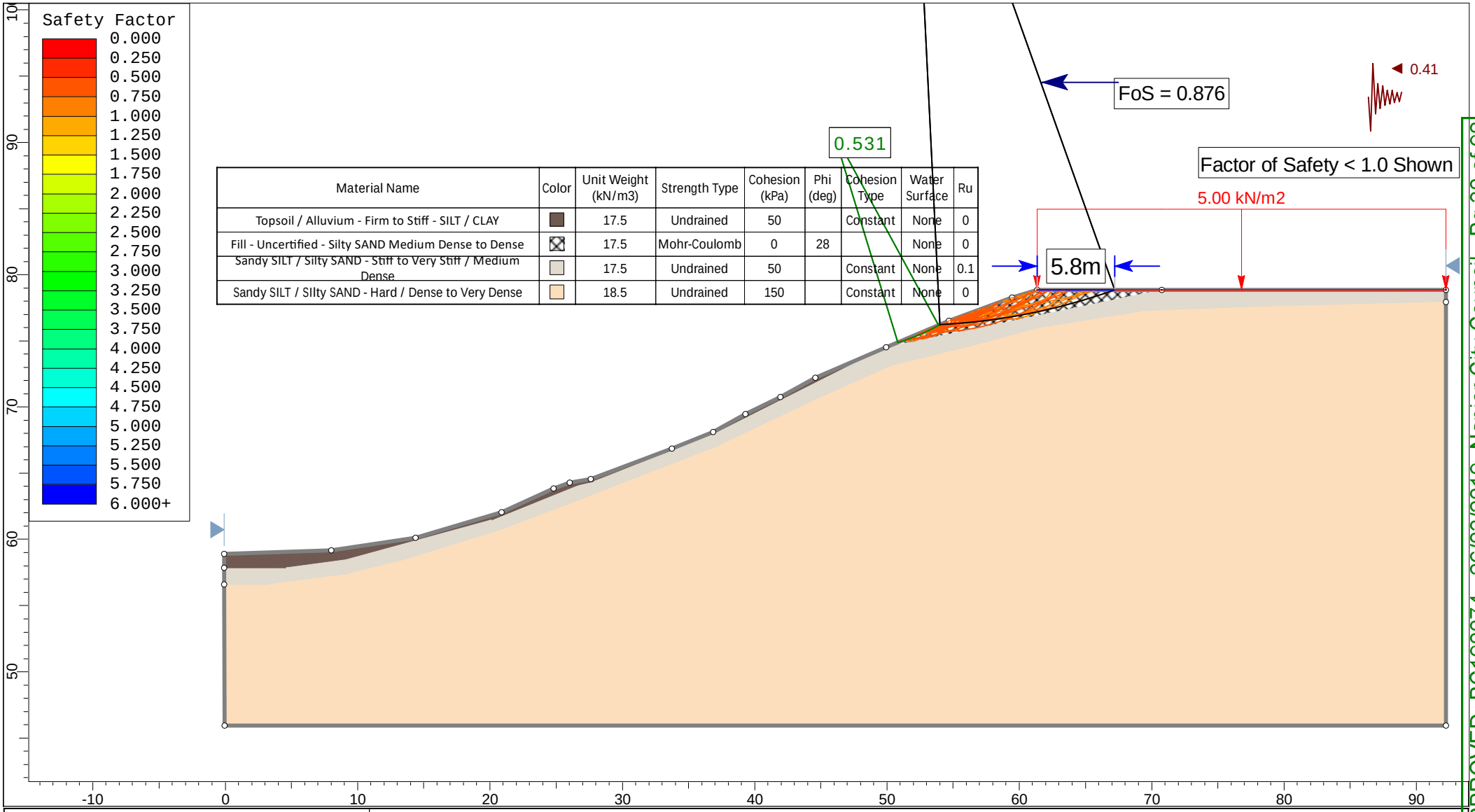
SLIDEINTERPRET 8.016

Project	50 Silverton Road		
Analysis Description	South-West Slope - Elevated Pore Pressures		
Drawn By	Chris Goss	*Scale* 1:400	*Company* WSP OPUS
Date	6/09/2018		*File Name* SW Slope - Elevated Pore Pressures.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Cohesion Type	Water Surface	Ru
Topsoil / Alluvium - Firm to Stiff - SILT / CLAY		17.5	Undrained	50		Constant	None	0
Fill - Uncertified - Silty SAND Medium Dense to Dense		17.5	Mohr-Coulomb	0	28		None	0
Sandy SILT / Silty SAND - Stiff to Very Stiff / Medium Dense		17.5	Undrained	50		Constant	None	0.1
Sandy SILT / SIlty SAND - Hard / Dense to Very Dense		18.5	Undrained	150		Constant	None	0

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SLIDEINTERPRET 8.016

Project	50 Silverton Road		
Analysis Description	South-West Slope - Seismic ULS		
Drawn By	Chris Goss	*Scale* 1:400	*Company* WSP OPUS
Date	6/09/2018		*File Name* SW Slope - Seismic - ULS.slmd

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www.wsp-opus.co.nz

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SOUTHERN LAKES
Po Box 169
Wanaka 9343
T: +64 3 443 6209

CANTERBURY
T: +64 21 824 063

Structural Design Calculations for:

Lot 1

50 Silverton Road

Poraiti

Napier

Job #: 83160

January 2019

Date : 16/01/2019
Designer : AAF
Checker : NL
Job Number : 83160

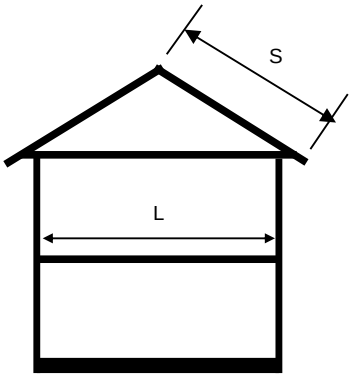
Raftfloor Design

WILTON JOUBERT Consulting Engineers

Site Address : Lot 1, 50 Silverton Road
Description : EDGE BEAM

Loadings

Upper Wall must be Timber



Tributary Roof and Floor Lengths

WALLS

Lower: Timber

(North/South Taupo)

	=	38	kg/m^2
	=	0.37	kPa
Height	=		m
Load/m	=		kN/m

Upper: Timber

(North/South Taupo)

	=	38	kg/m^2
	=	0.37	kPa
Height	=	2.50	m
Load/m	=	0.93	kN/m

Other (Specify Wall Weight)

Weight	=		kg/m^2
	=		kPa
Height	=		m
Load	=		kN/m

SUSPENDED MID-FLOOR Tributary Length L/2

Unit/Floor	=	Timber	
Topping	=	N/A	
	=	0.38	kPa
Live Loading	=	1.50	kPa
Super Imposed Dead	=		kPa
Tributary Span	=		m
Dead Load/m	=		kN/m
Live Load/m	=		kN/m

ROOF Light Tributary Length = S

	=	0.46	kPa
Live Loading		0.25	kPa
Tributary Span	=	4.04	m
Dead Load/m	=	1.86	kN/m
Live Load/m	=	1.01	kN/m

Loadings Summary

Walls	0.93	kN/m	Dead
Mid Floors		kN/m	Dead
		kN/m	Live
Slab*	3.42	kN/m	Dead+SDL
	0.90	kN/m	Live
Roof	1.86	kN/m	Dead
	1.01	kN/m	Live^
Extra Dead		kN/m	Dead
Extra Live		kN/m	Live

* Includes Edge Beam Weight, SDL = 0.5 kPa LL = 1.5 kPa

^ Roof LL not added if midfloor exists else LL = 0.25 kPa

Date : 16/01/2019
Designer : AAF
Checker : NL
Job Number : 83160

Raftfloor Design

WILTON JOUBERT
Consulting Engineers

Site Address : Lot 1, 50 Silverton Road
Description : EDGE BEAM

Working Loads

	Dead		6.21	kN/m
	Live		1.91	kN/m
Ultimate Loads (1.2G + 1.5Q)	Dead		7.45	kN/m
	Live		2.86	kN/m
Total Ultimate Load on Edge		w =	10.31	kN/m

Edge Beam Details

Wall Construction Type: Timber Clad Frame min beam width 200mm

Beam Width =	300	mm
Pod Depth =	220	mm
Top slab Depth =	85	mm
Self Weight =	2.20	kN/m
Construction Type =	Standard Raft	

Standard Raft Construction

Dependable bearing capacity: 150 kPa

Bearing Check = OK!
Working Pressure = 24 kPa

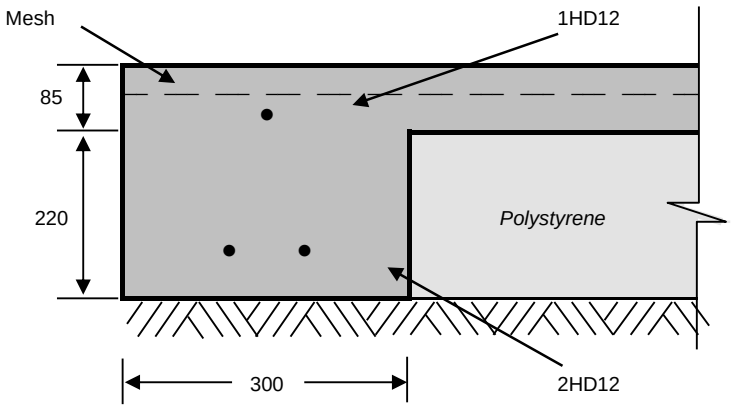
Steel Requirements - As Per Std Drg's

Top Steel: 1HD12
Btm Steel: 2HD12

Prescribed Edge Beam Design

Location (ie: which wall):
EDGE BEAM

Standard Raft Contruction
300 mm wide edge beam with
1HD12 in top & 2HD12 in bottom



Date : 16/01/2019
Designer : AAF
Checker : NL
Job Number : 83160

Raftfloor Design

WILTON JOUBERT
Consulting Engineers

Site Address : Lot 1, 50 Silverton Road
Description : SLIDING RESISTANCE

Calculation of Shear Pile Requirements

Use AS1170 design philosphy of preventing damaging movement up to an SLS event,and thereafter accepting increasing levels of damage as the event increases.

Assumed Class C soil:

City/town:	Napier		
C(t) = Ch(t) Z R N(T,D)			
Ch(t)	2.36		
Z	0.38		
Rs (25 yr RP)	0.25		
Ru 500yr	1	Assume T1 = 0.4	
N(T,D)	1 SLS	ku = 1 + (u-1)T1/0.7	
C(t) SLS	0.22	ku =	1
C(t) ULS	0.90		

Cd(T1) = C(t) Sp/ku For base sliding Sp = 1.0

SLS Cd(T1) = 0.22 Note for Class D soil SLS Cd(t1) = 0.29
ULS Cd(T1) = 0.78 ULS Cd(t1) = 1.00

Testing by Dr McManus University of Canterbury (Geotechnical Society Symposium, 2003) found the friction co-efficient of slab on polythene on sand had peak friction co-efficients of 0.42 for an unloaded slab and 0.53 for a loaded slab. Residual friction coefficient were 0.38 and 0.49 respectively.

These values are some what lower than that published by other sources, normally 0.7 peak and 0.5 residual.

Even using the lower values there will be no relative movement between the slab and the ground at SLS level event on either Class C or D. At ULS level event there may be relative movement between the slab and the ground, this may break services to the house, but will also serve to reduce the forces transferred to the structure of the house. This is acceptable within the intent of NZS 1170.5 2004.

Therefore, based on the above, shear key piles are unnecessary.

GENERAL

1. Do not scale from drawings. These drawings are to be read in conjunction with the architectural drawings and all other related documents. Refer to architectural drawings for dimensions, rebates & recesses.

2. Contact the architect/engineer if any discrepancies are found.

3. Under no circumstances shall polystyrene spacers be used. Use recommended spacers as per details provided.

4. DPM shall be in accordance with NZS3604 (polyethylene sheet, min. 0.25mm). Do not use multiple layers. All penetrations through the DPM shall be sealed.

5. A layer of sand blinding or granular fines (GAP7) shall be placed, screeded and compacted over the building platform. The maximum thickness of this layer shall be no more than 50mm.

6. All service trenches shall be properly backfilled and compacted.

7. Where underfloor heating is installed, floor topping shall be increased to 110mm.

8. Where concrete polishing and/or architectural cuts are made to the floor, the floor thickness shall be increased such that the final topping depth is no less than that specified on the plans after all polishing/cuts.

9. Polystyrene pods shall be 1100 x 1100 x 220mm or 1200 x 1200 x 220mm.

CONCRETE

1. All concrete work and materials shall conform to NZS3109 and applicable building consent authority regulations.

2. No cuts shall be made to the floor other than those shown on the drawings.

3. Unless otherwise noted, concrete shall be:

20MPa minimum or 25MPa minimum within 'exposure zone D' (if in doubt, confirm with local BCA)

REINFORCEMENT

1. Unless otherwise specified, all reinforcement shall be Ductility Class E, in accordance with NZS 4671.

2. All bend diameters shall comply with NZS 3109. Re-bending of reinforcement is not permitted. 'Spot' welding of reinforcement is not permitted.

3. All mesh reinforcement shall be Ductility Class E as per NZS4671

4. Unless otherwise specified by proprietary product specifications, mesh shall be lapped a minimum of 250mm or by a grid plus 50mm, whichever is greater.

5. Unless otherwise specified on plans, minimum covers are:
   exposed to earth: 75mm
   exposed to edge: 50mm
   protected by damp proofing: 50mm

6. Unless otherwise specified, reinforcement laps are:

Reinforcement Grade	Nomination	min. lap (whichever is greater)	concrete strength (MPa)
300	'D'	40Ø or min. 600mm	all blockfill, 20 and 25
500	'HD'	70Ø	all blockfill
500	'HD'	56Ø	20
500	'HD'	50Ø	25

SITE CONDITIONS

1. Design based on soils report/assessment
By: WSP Opus Ref: 2-S5361.00 00002 Dated: 12.09.18
Design based on all unsuitable material removed (to approximate depth of 0.3m) and uniform non-expansive soils across building platform with a minimal allowable bearing capacity of: 100 kPa. For filled ground, minimum allowable bearing capacity of 100kPa for hardfill such as GAP40 etc, and minimum shear strength of 150 kPa for clay fill, subject to engineers confirmation.

2. Building platform, where filled above CGL/FGL, shall be extended min. 1.0m beyond the building footprint.

3. Confirm position & depth of all public pipes on the site, prior to any works. If different to the site plan then Wilton Joubert Ltd. shall be contacted.

4. Where compacted fill (to replace excavated material) is required to form building platform, the fill/excavation shall be extended past the building edge by at least the same depth that is being excavated.

5. Building foundation shall be outside of 45° + 0.5m influence line from the bottom of any public pipes and 1V:1.5H influence line of any buried tanks.

6. All structures within the building platform area to be constructed a minimum distance of 5.0m from the crest of the north-western slope and 6.0m from the crest of the southwestern slope as indicated by the building set-back line on the Site Plan (Appendix A of the geotechnical report).

INSPECTIONS

1. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).

2. If BCA requires PS4 to be issued for inspections, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.

NOTES:
Do not scale from Drawings.
Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers
Northland: 09 945 4188
Auckland-Waikato: 09 527 0196
Canterbury: 021 824 063
Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

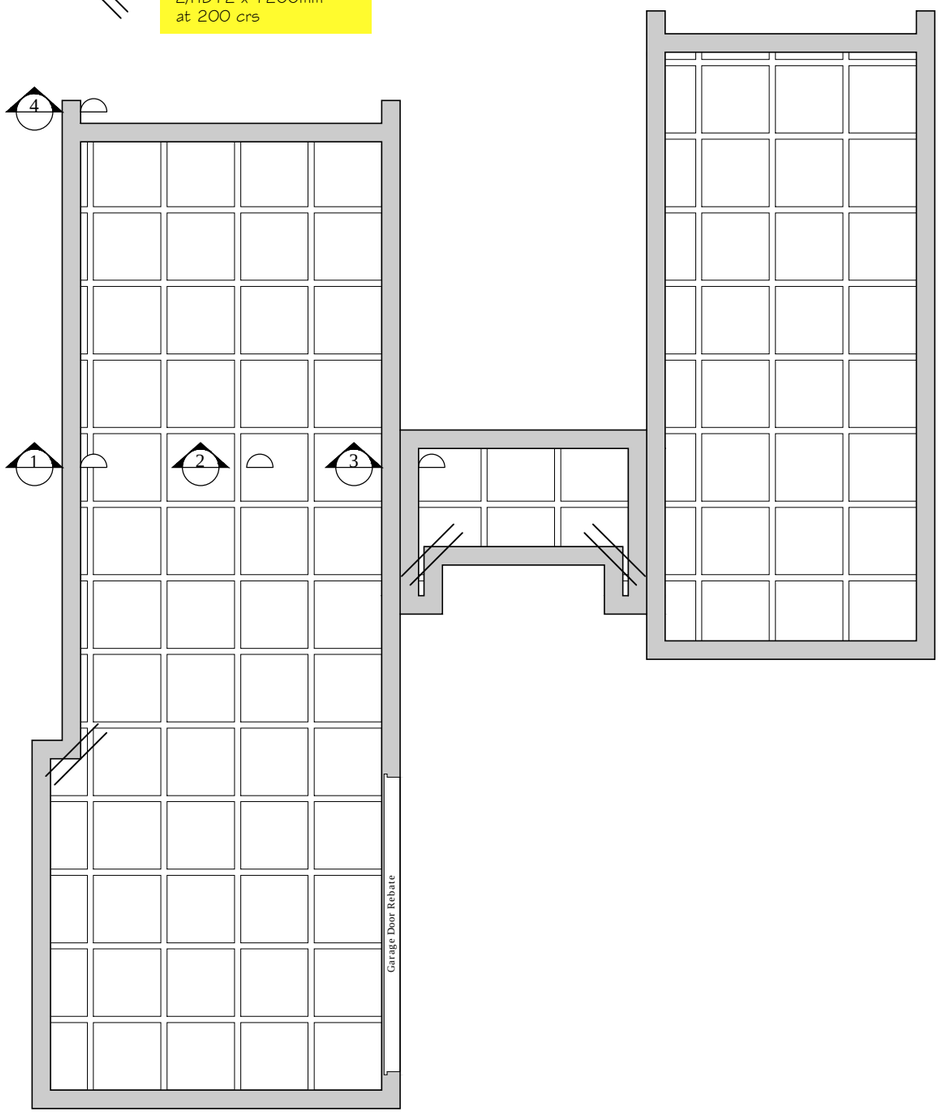
Job Title:
Proposed Residence
Lot 1
50 Silverton Road
Poraiti, Napier

Sheet Title:
General Notes

Designed: AAF	Drawn: MH
Checked: NL	Reviewed:
Scales:	Date: 18-1-2019
Job # 83160	Dwg No: S0

Legend:

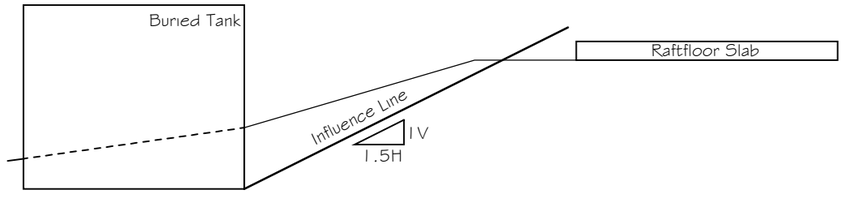
Re Entrant corner steel
2/HD12 x 1200mm
at 200 crs

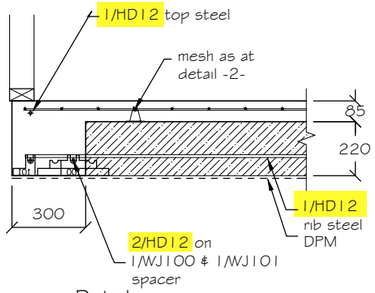


Raft Floor Plan

Scale 1:100

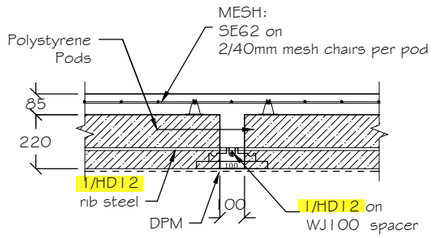
Note: Buried Tank Influence Line requirement





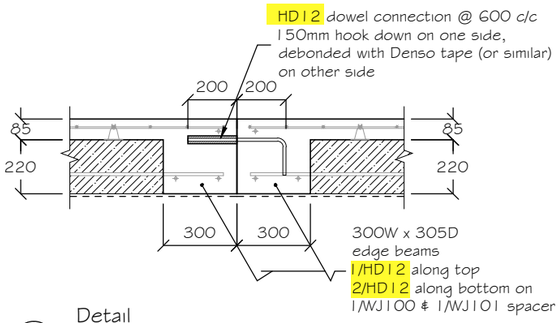
1 Detail

Raftfloor Edge Beam - 300
Scale 1:25



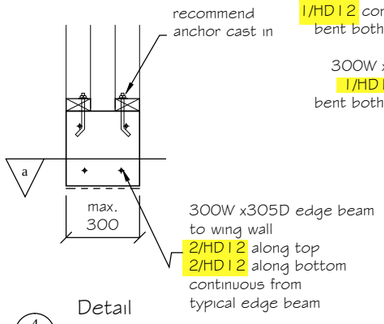
2 Detail

Raftfloor Internal Rib - 100
Scale 1:25



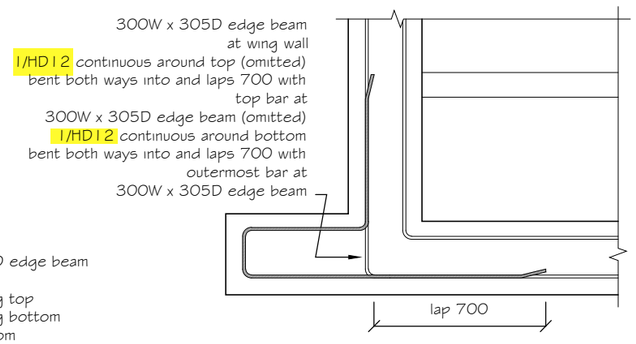
3 Detail

Raftfloor Edge Beam - 300
with control joint
Scale 1:25



4 Detail

Raftfloor Edge Beam - 300
At Wing Wall
Scale 1:25



4a Detail

As Required
Scale 1:25

Quantities of Spacers

(Quantities are approximate and to be used as a guide only)

Item	Qty.
WJ100 Centre Spacer	170
WJ101 Clip-on Spacer	90

NOTES:

Do not scale from Drawings.
Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers

Northland: 09 945 4188
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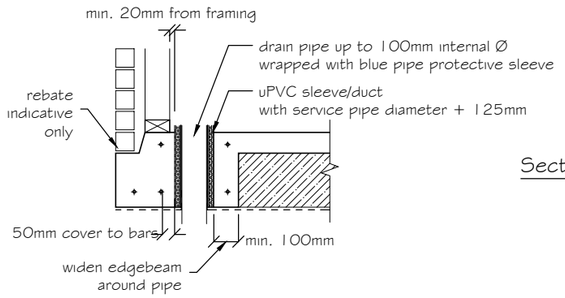
Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

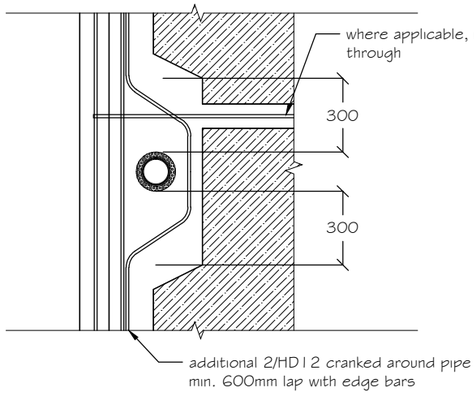
Job Title:
Proposed Residence
Lot 1
50 Silverton Road
Poraiti, Napier

Sheet Title:
Raft Floor
Plan & Details

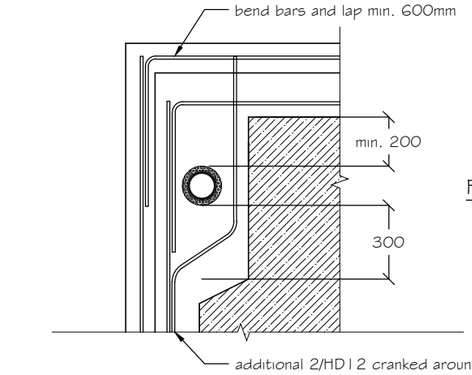
Designed: AAF	Drawn: MH
Checked: NL	Reviewed: ...
Scales: 1:100 & 1:25	Date: 18-1-2019
Job No: Job # 83160	Dwg No: S1



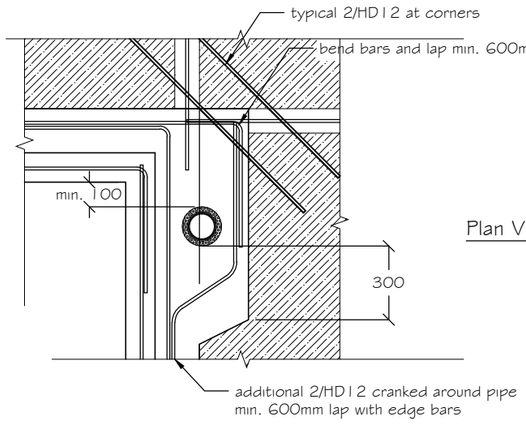
Section View: At Edge



Plan View: At Edge



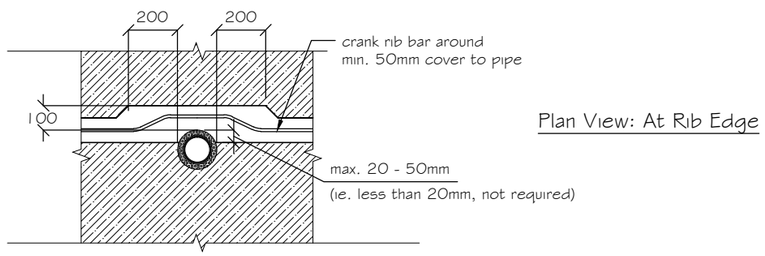
Plan View: At Open Corner



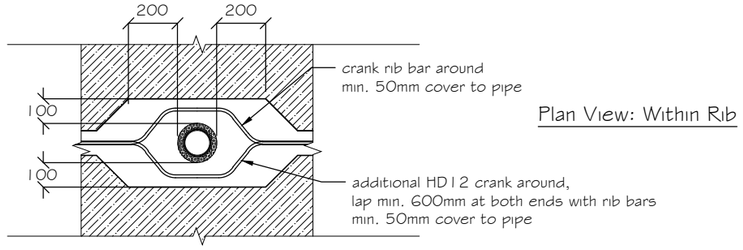
Plan View: At Closed Corner

Typical Detail Around Pipes

Raftfloor Edge Beam



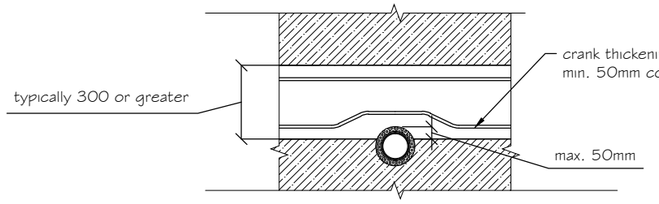
Plan View: At Rib Edge



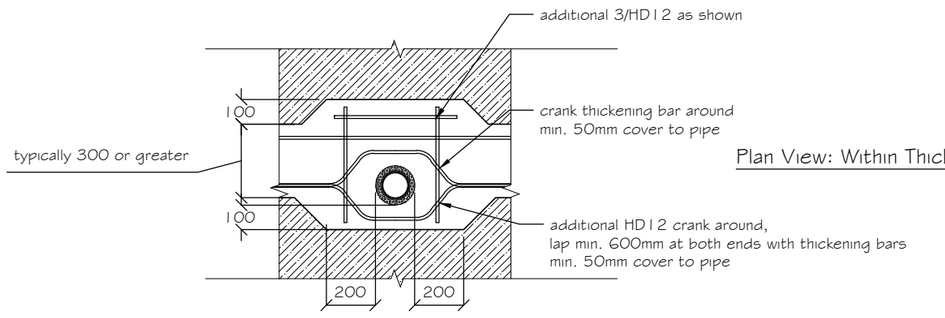
Plan View: Within Rib

Typical Detail Around Pipes

Raftfloor Internal Ribs



Plan View: At Thickening Edge



Plan View: Within Thickening

Typical Detail Around Pipes

Raftfloor Internal Thickenings

NOTES:

These details are applicable where plumbing/services are conveyed underground. Services are to be taken through polystyrene pods as much as possible. If this is unavoidable, it may be taken through ribs/thickenings, provided the details (or similar in principle) on this sheet are used.

All service trench backfill shall be properly compacted.

Member sizes and reinforcing shown are indicative only, details shown on raftslab plan & details shall take precedence over the details shown here.

NOTES:

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers
Northland: 09 945 4188
Auckland–Waikato: 09 527 0198
Canterbury: 021 824 063
Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

Job Title:

Sheet Title:
Typical Pipe Details

Designed:	--	Drawn:	DL
Checked:	DL	Checked:	--
Scales:	1:25	Date:	2019
Job No: / Revision No:		Plans No:	D1

Building Code Clause(s)……..

PRODUCER STATEMENT – PS1 – DESIGN

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

ISSUED BY: Wilton Joubert Ltd.
(Design Firm)

TO: Homeworx Design and Build Limited
(Owner/Developer)

TO BE SUPPLIED TO: Napier City Council
(Building Consent Authority)

IN RESPECT OF: Raftfloor design
(Description of Building Work)

AT: 50 Silverton Road, Poraiti
(Address)

Town/City: Napier **LOT** 1 **DP**…… **SO**……
(Address)

We have been engaged by the owner/developer referred to above to provide:

structural design services

(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/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 the drawings titled:

Lot 1, 50 Silverton Road, Poraiti, Napier and numbered S0-S1,D1;

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 as per Slope Stability Analysis by WSP Opus. Ref: 2-S5361.00 00002, Date 12.09.18
(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, David Lau am: ■ CPEng 221906 # ☐ Reg Arch …… #
(Name of Design Professional)

I am a member of: ☑ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE(Hons),PhD,CMEngNZ,CPEng,IntPE
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 David Lau (Signature)… 
(Name of Design Professional)

ON BEHALF OF Wilton Joubert Ltd. Date 21/01/2019
(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.

WILTON JOUBERT
Consulting Engineers

To the BCA

Site address: 50 Silverton Road, Poraiti

Dear Sir / Madam,

B2 Compliance

You have requested a Producer Statement for Design – PS1 for Clause B2 of the Building Code – Structural Durability. Based on advice by Engineering New Zealand, we are not able to provide this because there is no effective verification method for B2 contained within the Building Code.

However, we can confirm that for the structural elements shown in our documentation:

Timber

Timber treatment has been selected in accordance with Table 1A of B2/AS1. In general this is already covered by the submitted architectural drawings.

Concrete & Masonry

Concrete covers have been selected in accordance with NZS3101, Part 1, Section 3. Masonry as per NZS4230, Table 4.1.

Mild Steel

Generally, steel member/connections requirements as per NZS3604:2011 or proprietary coatings to comply with AS/NZS2312. Otherwise, steel protection has been specified in accordance with the 'Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings' AS/NZS 2312. We note that this is on a time to first maintenance basis.

We trust this provides the information that you are seeking.

Yours faithfully

David Lau, Wilton Joubert Ltd. Dated: 21/01/2019

WILTON JOUBERT
Consulting Engineers

NORTHLAND
PO Box 8130
Kensington
Whangarei 0145
T +64 9 945 4188

AUCKLAND
WAIKATO
PO Box 11-381
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Auckland 1524
T +64 9 579 1114
F +64 9 579 7778

CANTERBURY
PO Box 6312
Upper Riccarton
Christchurch 8442
T +64 3 341 1373

SOUTHERN LAKES
PO Box 169
Wanaka 9343
T +64 3 443 5322

PRODUCER STATEMENTS – Advisory Note

Producer Statements shall be submitted to territorial authorities or building consent authority in order for Code of Compliance Certificates to be issued. The requirement for consultants to issue the related Producer Statements may appear as a condition under the building consent documents or as a separate letter from the territorial authority or building certifier. **It is the owner's (or consent applicant) responsibility to check the building consent documentation and notify Wilton Joubert Ltd. in relation to the requirement for construction inspections required (and the subsequent PS4: Producer Statement for Construction Review) as stated on the consent documents. Please note, we cannot issue PS4 if we did not carry out the inspection.**

In order to secure our inspection services, it is strongly recommended that Wilton Joubert Ltd. be given at least 48 hours notice prior to time of inspection. Our inspections are limited to items that have been designed and detailed by us. We are also unable to inspect non-consented or unauthorised work. Building consented, stamped plans with consent numbers (or legible copy of the same) including amendments where applicable shall be made available on site during inspections.

In some cases due to the distance of the job from our offices, it may be more practical and cost effective to contact a local professional engineer to carry out the inspection, who may contact us with any questions that may arise. The engineer who carried out the inspection would subsequently be responsible for the issue of the producer statement for construction review.

The costs associated with site inspections and issuing of Producer Statements are separate from any previous work that we have been engaged for, such as engineering design of works. The costs for carrying out the inspections and related work are based on time spent travelling to site, time on site and other associated costs. Please contact us for an estimate of costs. Our assumptions are that the person(s) who arranged the inspection is responsible for payment of the fees, unless otherwise stated at time of engagement.

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and section 30C, 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: 50 Silverton Road	
Suburb: Poraiti	
Town/City: Napier	Postcode:

THE OWNER(S)		
Name(s):		
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 David Lau 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 ⊗		○ Carried out ○ Supervised	
Foundations and subfloor framing ∅	Raftfloor (B1)	○ Carried out ◉ Supervised	S0-S1, D1

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 ☒		◯ Carried out ◯ Supervised	
Roof ☒		◯ Carried out ◯ Supervised	
Columns and beams ☒		◯ Carried out ◯ Supervised	
Bracing ☒		◯ Carried out ◯ Supervised	
Other ☒		◯ Carried out ◯ Supervised	

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 ☒		◯ Carried out ◯ Supervised	
Damp proofing ☒		◯ Carried out ◯ Supervised	
Roof cladding or roof cladding system ☒		◯ Carried out ◯ Supervised	
Ventilation system (for example, subfloor or cavity) ☒		◯ Carried out ◯ Supervised	
Wall cladding or wall cladding system ☒		◯ Carried out ◯ Supervised	
Waterproofing ☒		◯ Carried out ◯ Supervised	
Other ☒		◯ Carried out ◯ Supervised	

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		◯ Carried out ◯ Supervised	
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: David Lau	LBP or Registration number: 221906
The practitioner is a: ◯ Design LBP ◯ Registered architect ◉ Chartered professional engineer	
Design Entity or Company (optional): Wilton Joubert Ltd.	
Mailing address (if different from below): PO Box 11381, Ellerslie, Auckland 1542	
Street address/Registered office: 108 Lunn Avenue	
Suburb: Mt. Wellington	Town/City: Auckland
PO Box/Private Bag:	Postcode:
Phone number: 09 527 0196	Mobile:
After hours:	Fax:
Email address: jobs@wjl.co.nz	Website: www.wiltonjoubert.co.nz

DECLARATION

I David Lau 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:

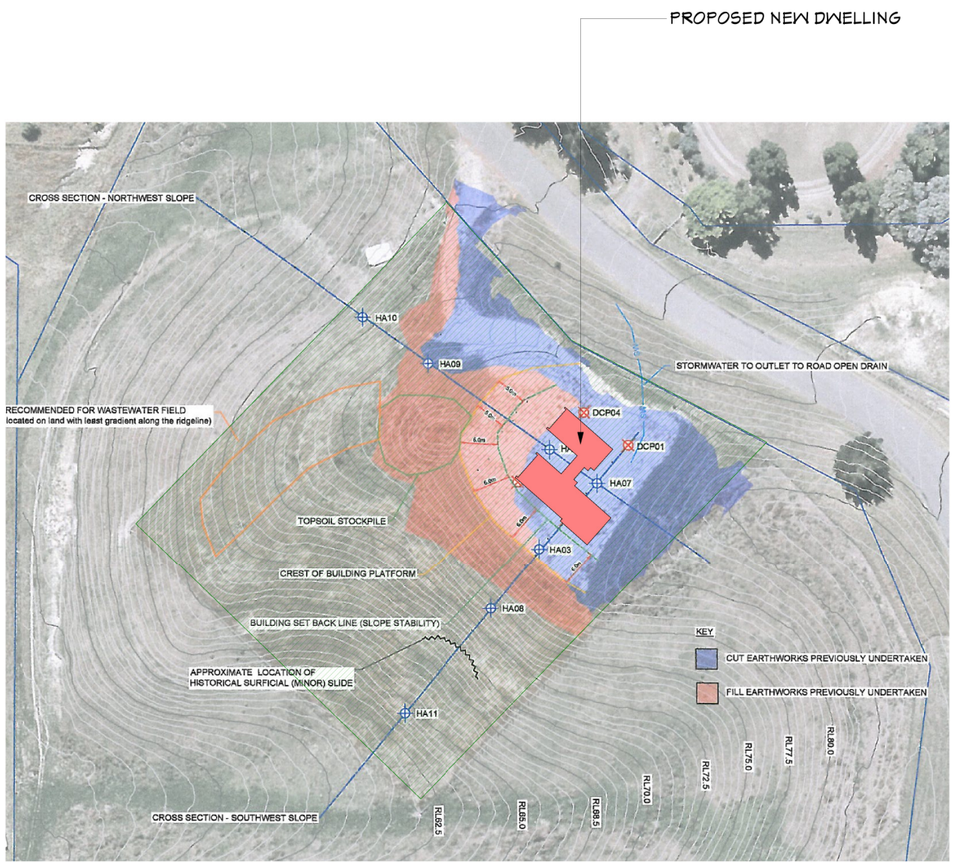
- Complies with the building code, or
- ~~Complies with the building code subject to any waiver or modification of the building code recorded on this form~~

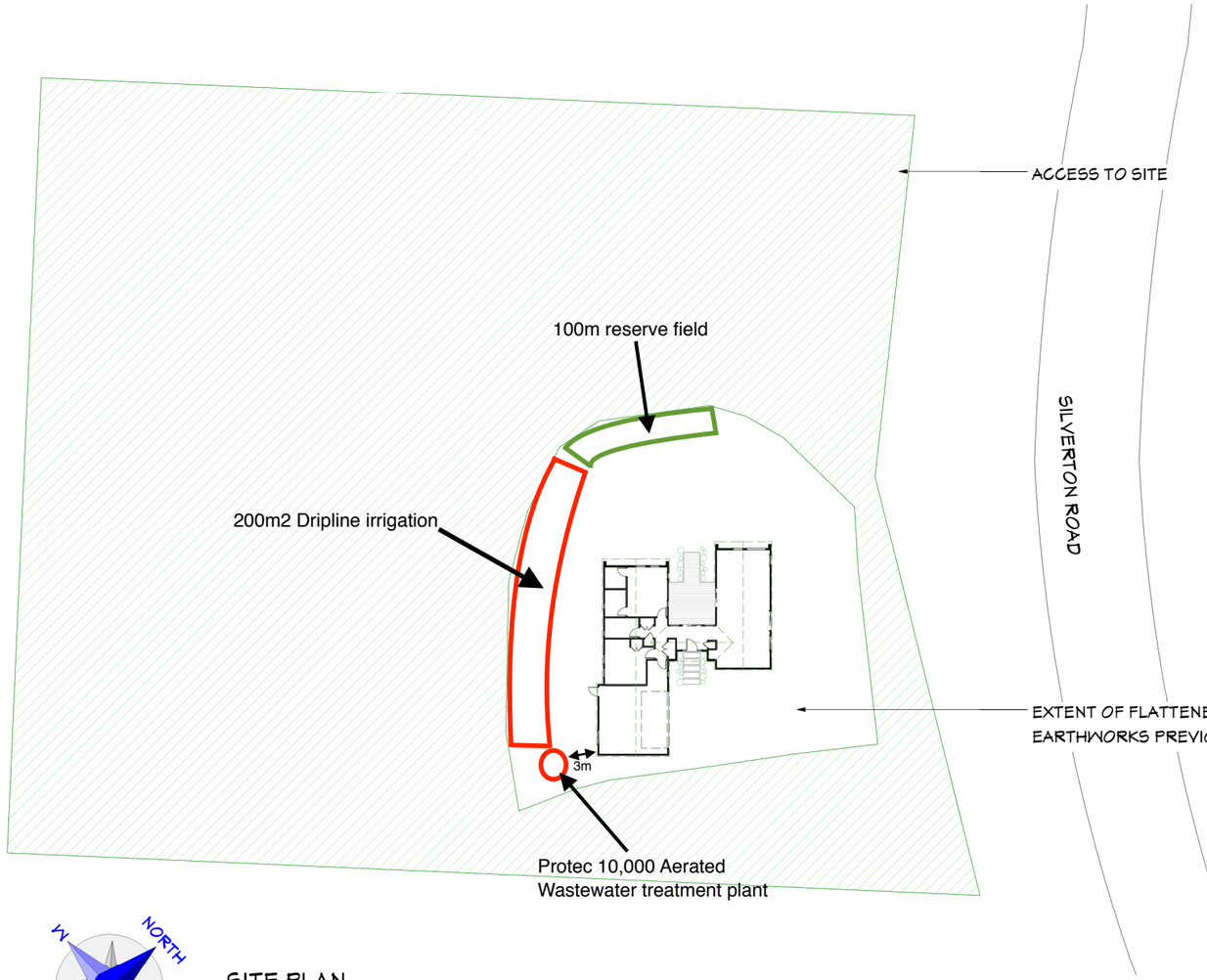
Signature: 

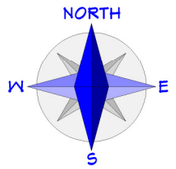
Date: 21/01/2019

50 Silverton Road
Lot 1 DP 522712
AREA: 0.5 Ha
EARTHQUAKE ZONE: 3
CORROSION ZONE: C
CLIMATE ZONE: 2
WIND ZONE: EXTRA HIGH

SWD Wastewater & Drainage ltd
Caleb Snee
Rego-18598
Date-1.02.2019







LOCATION PLAN
Scale 1:1000

SITE PLAN
Scale 1:500

Homeworx
New homes design and build

Schmidli Home

50 Silverton Road
Poraiti
Napier

Drawing Title: Location & Site Plan
Drawing Scale: As Shown

Designed by Gordon Sanson
LBP 117656

Notes:

Date Drawing Printed:
Tuesday, January 22, 2019

2

WASTEWATER&DRAINAGE SWD

1017 Outram Road | Hastings | 4122
M: 027 333 8212
E: caleb@swdnz.co.nz
www.swdnz.co.nz

DESIGN SPECIFICATION

Client:	Kurt Schmidil
Site Location:	50 Silverton road Poraiti
System Type:	Protec 10,000 Waste water treatment plant.
Effluent Distribution Method:	Drip line irragation laid at 1m centres approx 150mm below ground
Design Loading Rate:	4mm/d
Design:	4 people @ 200 litres each/day = 800 litres/day potential effluent discharge
Land Area Required:	200m2
Reserve Area:	100m2

Caleb Snee
Owner Operator
Registration No.: 18598
Certifying Drainlayer

HAWKE'S BAY REGIONAL COUNCIL

HAWKE'S BAY REGIONAL COUNCIL
HAWKE'S BAY
APPROVED
DESIGNER
Caleb Snee
Domestic on-site wastewater treatment systems

Date: 25.03.2019

Owner/contact person: 50 Silverton road Phone/e-mail:

Designer/Installer: Caleb Snee Phone/e-mail: 0273338212

Address of site: 50 Silverton Road Poraiti

Legal Description: DP-522712

PERMITTED ACTIVITY CHECKLIST (RULE 37 RRMP & RULE 28 RCEP)

Condition (as per Rule 37 (RRMP) & Rule 28 RCEP)	Tick to show compliance
Where the wastewater receives no more than advanced primary treatment, the discharge shall be onto or into a property with a land area of no less than 2500m^2.	tick
Where the wastewater receives more than advanced primary treatment then: i. the discharge shall be onto or into a property with a land area of no less than 1000m^2; and ii. the net site area to discharge volume ratio shall not be less than 1.5 m^2 per litre per day[1].	tick
The rate of discharge of sewage (including greywater) shall not exceed 2 m^3/d, averaged over any 7 day period.	tick
The treatment and disposal system shall be designed to cater for the peak daily loading.	tick
The discharge shall not occur over the Heretaunga Plains or Ruataniwha Plains unconfined aquifer as shown in Schedule VI (RRMP).	tick
The discharge and land treatment field shall not be within 20m of any surface water body (including any stormwater open drain or roadside drain), or any tile drain or within 1.5m of any property boundary.	tick
The system shall be designed and installed in accordance with the requirements specified in Figure 6 (RRMP) or Schedule N (RCEP).	tick
There shall be no surface ponding as a result of the discharge, or direct discharge into any water body.	tick
The discharge shall be distributed evenly over the entire disposal area. (Pumped/dose loaded/distributed by siphon)	tick
There shall be no increase in the concentration of pathogenic organisms in any surface water body as a result of the discharge.	tick
At the time of installation and commencement, the discharge shall not occur within 30 m of any bore drawing groundwater from an unconfined aquifer into which any contaminant may enter as a result of the discharge.	tick

[1] NOTE: The net site area to discharge volume ratio can be calculated by dividing the net site area by the expected daily wastewater volume. If the answer is less than 1.5, the discharge does not comply with this condition. e.g. a 1000 m^2 property with a three bedroom home on it with maximum daily discharge volume of 1200 L (6 people at 200 L/p/d) has a ratio of 0.83 (1000/1200). This discharge would not comply with this condition.

Condition (as per Rule 37 (RRMP) & Rule 28 RCEP)	Tick to show compliance
The point of discharge shall be no less than 600mm above the highest seasonal groundwater table	tick
The discharge shall not result in, or contribute to, a breach of the "Drinking Water Quality Standards for New Zealand" (Ministry of Health, 2005 (Revised 2008)) in any groundwater body after reasonable mixing.	tick
The discharge shall not cause any emission of offensive or objectionable odour, or release of noxious or dangerous gases (including aerosols) beyond the boundary of the subject property or on any public land.	tick
For discharges using pit privies: i. the privy shall be constructed in soil with an infiltration rate not exceeding 150mm/h, and ii. the privy shall not be the primary wastewater system for any permanently occupied dwelling.	Yes ☐ N/A ☑ Yes ☐ N/A ☑
The system shall be designed, constructed, operated and maintained in a manner which ensures that there is no clogging of the disposal system or soils.	tick
The discharge shall not be into a trench or bed disposal system constructed in category 5 or 6^2 soil except where wastewater receives at least secondary treatment.	tick
Where the wastewater receives secondary treatment or better, the discharge shall not exceed 20g/m^3 of BOD, and 30g/m^3 of suspended solids.	Yes ☑ N/A ☐
The wastewater treatment and land application system shall be maintained in accordance with the manufacturer's instructions, or if no manufacturer's instructions exist, in accordance with the best management practice as described in AS/NZS 1547, or TP58: On-site Wastewater Systems: Design and Management Manual (Auckland Regional Council Technical Publication No. 58), or other alternative recognised on-site wastewater design manuals. A schedule of maintenance shall be kept, and this schedule shall be available for inspection by the Regional Council upon request. Note: To ensure on-going compliance with this rule, you will need to ensure that the system is properly maintained. You should seek advice from the installer about what maintenance (for example cleaning the outlet filter and pumping out the tank) is required.	tick
The discharge shall not be disposed of by way of spray irrigation.	tick
The discharge shall not be into a raised bed.	tick
Additional comments:	

I confirm that, the information I have provided is accurate to the best of my knowledge and the proposed design meets the conditions of permitted activity Rule 37 (RRMP) or Rule 28 (RCEP). Therefore, resource consent is not required from the Hawke's Bay Regional Council for the discharge of contaminants from an on-site wastewater treatment system to land on the subject property.

Signed: _____ Date: _____

25.03.2019

On-Site Wastewater Disposal Site Assessment, Subsoil Investigation and Site Evaluation Checklist

1. Site Evaluator

1.1	Name: Caleb Snee	Registration Number: 18598
	Company: Swd Wastewater & Drainage	Address: P.O.Box 28019 H/N
	Phone: Fax:	Mobile: 0273338212

2. Site Information

2.1	Location Address: 50 Silverton road		
	Owner: Kurt Schmidil	Address: 50 Silverton road	
	Phone:	Fax:	Mobile:
2.2	Legal Description Property Number- 56272	Lot No: lot 1 DP: 522712	Valuation No:
	Area of Site: m^2	Ha: 0.5	

2.3	Shape/Layout of site - plans attached?	Yes	☑	No	☐
2.4	Photographs of site attached?	Yes	☐	No	☑
2.5	Percolation Test Results Attached?	Yes	☐	No	☑
2.6	Illustration of Soil Structure Attached?	Yes	☑	No	☐
2.7	Photograph of Soil Structure Attached?	Yes	☐	No	☑

3. Hydraulic Loading Information

3.1	Number of Bedrooms 6	Number of Persons 12	Design Loading Rate Per Person (1/day) 200

3.2	Waste Disposal Unit Installed?	Yes	☐	No	☑
3.3	Water Saving Devices Fitted?	Yes	☐	No	☑
3.4	Water Supply / Rain Water / Bore/Well / Reticulated (cross out those not applicable)				

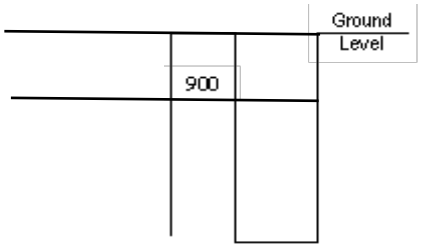
4. Site Assessment

4.1	Have Plans / Photographs of the Site been supplied? **If not, why not**	Yes	☑	No	☐
4.2	Topography of Site – Flat (<10%) / Rolling (10-20%) / Sloping (20-30%)/ Steep (>30%) (cross out those not applicable)				
4.3	Give details if different from 4.2				

4.4	Does the site contain fill?	Yes	☐	No	☑	Unknown	☐
4.5	Does the site Contain Drainage Flow Paths?			Yes	☐	No	☑
4.6	Any Visible or Known Stormwater Problems?			Yes	☐	No	☑
4.7	Need for Ground Water/Surface Water "Cut-Off / Collector Drains"			Yes	☐	No	☑
4.8	Is the winter High Water table known? If known comments please:			Yes	☐	No	☑

4.9	Proposed Disposal and Reserve area, Distance from: Boundaries ..1.5.. / Waterway ..na.. / Well/Bore ..na.. / Buildings..3m..
4.10	Local Experience – (Existing on-site Systems) (Either Comment or tick which is applicable) Is performance Satisfactory? Yes ☑ No ☐ Unknown ☐ N/A ☐ If answer is No - Comments please

5. Sub Soil Investigation

5.1	How was Soil Profile Determined? Bore Holes / Dig Test Holes / Earlier Site Excavations / Other – (Please specify)				
5.2	Have the soils been assessed by an Independent Party? If so please specify LDE Geotec Report Ref 13295	Yes	☑	No	☐
5.3	Has the soil structure Profile been completed? Have photographs been supplied? 	Yes Yes	☑ ☐	No No	☐ ☑
5.4	Has Percolation Testing been carried out? If YES specify method	Yes	☐	No	☑
5.5	Are Percolation test results attached?	Yes	☐	No	☑
5.6	Soil Category - show the estimated soil category from the descriptions below:				
			Tick applicable box		
	1. Gravel, coarse sand, rapid draining, structureless		☐		
	2. Sandy Loams – weakly structured		☐		
	3. Loams – moderate to weak structure		☑		
	4. Clay Loams – weak to massive		☐		
	5. Light Clays - Strong / Moderate / Weak		☐		
	6. Medium to Heavy Clays - Strong / Moderate / Weak		☐		

6. Site Evaluation

6.1	Design Considerations:				
	Any environmental constraints? If yes please specify	Yes	☐	No	☑
	Any soil constraints? If yes please specify (see 5.6)	Yes	☐	No	☑
	Any site constraints? If yes please specify (see 2.2, 4.2, 5.6) Slopes	Yes	☑	No	☐
	Any Hawke's Bay Regional Council (HBRC) constraints? If yes please specify – Rule: 35 / 36 / 37 (Please circle which rule applies)	Yes	☐	No	☑

6.2	Type of Sewer Treatment System considered best suited for the site 10.000ltr Secondary treated wastewater treatment plant
6.3	Type of Disposal System considered best suited for the site Subsurface Dripline
6.4	Minimum disposal area recommended (for trenches / beds / irrigation systems - see 6.2 and 6.3 attached and 6.8 below) 200m2
6.5	Minimum size of reserve area (See HBRC & HDC Requirements) 100 m2
6.6	Are sewer treatment system and disposal system calculations and design plans attached? Yes ☑ No ☐ **If not why not**
6.7	Other comments: 2 Bedrooms= 4 PE x 200 l/ person/day=800l/day 800 / 4 = 200m2
6.8	Trench and bed calculation from AS/NZS 1547 2012

Calculations:

Length of drain = Q ÷ (sum of DLR x W)

Example:
Q = Litre/day used = 3 bedroom, 6 people x 180 L/D/person
Q = 1080 ÷ DLR from Table 4.2A1 ÷ trench width
= 1080 ÷ (15 x .600) (see 6.3)
= 1080 ÷ 9
= 120m of drain required (see 10b)

Or

Length of drain = Q x 1 ÷ DLR = m^2
= m^2 ÷ trench width = length of drain

Example: = 1080 x 1 ÷ 15 = 72 m^2
= 72 ÷ .600 = 120m of drain (see 6.3.2b)

7. General Comments

7.1	AS/NZS 1547:2012 "On-site domestic wastewater management" can be used for guidance in On-site evaluation and soil assessment. This Standard can provide options for on-site wastewater treatment and land application systems.
7.2	AS/NZS 1546.1:2008 "Septic tanks" has been adopted by the Hastings District Council. Unless a manufacturer has built his tanks to comply with this Standard and had an engineer verify that the tanks comply with the Standard, that particular make of tank is not permitted to be installed within the Hastings District.
7.3	Where it is necessary to contact the Hawke's Bay Regional Council in relation to On-site Waste Water Disposal, Charlotte Drury Principal Consents Officer (06) 833 8058 is the person to contact.
	Name: Caleb Snee
	Signature: 
	Date: 01.09.2019

8. Design Flow Allowances for Sewage Systems

Source	Minimum wastewater flow allowance in L/person/day	
	On-site roof water tank supply	Reticulated community/bore water supply
Households	180	200
Households (blackwater only)	60	60
Households (greywater only)	90	120
Motels/hotels - Guests, resident staff - Non-resident staff - Reception rooms - Bar trade (per customer) - Restaurant (per diner)	 220 30 20-30 20 25-30	 220 30 20-30 20 25-30
Community halls - Banqueting - Meetings	 20 10	 30 15
Tea rooms (per customer) -Without restroom facilities -With restroom facilities	 10 15	 15 25
School (pupils plus staff)	15-30	15-30
Rural factories, shopping centres	30	50
Camping grounds - fully serviced -recreation areas	 100 50	 130 65

NOTE: For the purposes of determining building occupancy, Hawke's Bay Regional Council adopts an occupancy of 2 people per room, excluding bathrooms, kitchens, laundries and any other room that cannot feasibility be used as a bedroom

9. Trenches / Beds / Mounds

Maximum design loading rates for trenches, beds and mounds

Soil category	Soil texture	Structure	Design loading rate			
			Primary treated effluent		Secondary treated effluent (mm/d)	Mounds Specific design (mm/d)
			Conservative rate (mm/d)	Maximum rate (mm/d)		
1	Gravels and sands	Structureless	20 (see note 1)	35 (see note 1)	50 (see note 1)	32
2	Sandy loams	Weakly structured Massive	20 15	35 25	50 50	24 24
3	Loams	High/mod structure Weakly structure / massive	15 10	25 15	50 30	24 16
4	Clay loams	High/mod structure Weakly structured Massive	10 6 4	15 10 5	30 20 10	16 8 5
5	Light clays	Strongly structured Mod structure / massive	HBRC consent required – see Rule 37(nA)	HBRC consent required – see Rule 37(nA)	HBRC consent required – see Rule 37(nA)	8 Specialist soil advice & design techniques required
6	Medium to heavy clays	Strongly structured Mod structured / massive	HBRC consent required – see Rule 37(nA)	HBRC consent required – see Rule 37(nA)	HBRC consent required – see Rule 37(nA)	Specialist soil advice & design techniques required

Note 1: The treatment capacity of the soil and not the hydraulic capacity of the soil or the growth of the clogging layer govern the effluent loading rate of category 1 soils. Category 1 soils require special design.

10. Design Specifications for Trenches / Beds / Mounds

a) Trenches must be at least 400mm deep and 300mm wide and have a depth of aggregate of 200mm to 400mm.

b) They shall be limited to around 25m long, and there must be a spacing of at least 1000mm between adjacent trench walls.

c) Beds must be at least 1000mm wide, with a minimum spacing of 1000mm between adjacent bed walls and within 1.00m from distribution lines to wall of bed.

d) Multiple distribution lines to be included where beds are more than 1.5 metres in width.

e) Both trenches and beds must be backfilled with distribution media and covered with a minimum of 150mm of topsoil.

f) The discharge shall be pumped, or dosed in fixed quantities so that the wastewater is applied evenly across the entire land treatment field.

g) Gravity drainage to trench and beds is not permitted unless a specifically designed siphon system is used to provide dose loading and distribution over the entire trench or bed area at any one time.

h) Trenches or beds shall not be constructed on slopes of greater than 15 degrees (approximately 27% slope).

11. Irrigation Systems

Maximum design irrigation rates for irrigation systems

Soil Category	Soil texture	Design irrigation rate DRIP (mm/day)	Design irrigation rate LPED (mm/day)
1	Gravels and sands	5	Not advisable
2	Sandy loams	5	4
3	Loams	4	3.5
4	Clay loams	3.5	3
5	Light clays	3	2.5
6	Medium to heavy clays	2	Not advisable

Design specifications for Irrigation Systems

a) Irrigation lines placed on the surface shall be pinned to the surface and covered with at least 100mm of media after the surface has been scarified.

b) Subsurface irrigation lines shall be installed at a maximum depth of 200mm below ground level and covered with at least 100mm depth of cover.

c) Maximum spacing of 600mm in Category 1 and 2 soils and 1000mm in all other soil categories, as defined by AS/NZS 1547:2012.

d) Secondary treated wastewater shall be applied evenly across the entire land treatment field.

e) On sloping ground the design irrigation rate (DIR) shall be decreased to ensure that effluent migration down slope is taken up adequately with the top soil and plant root system. Required reductions according to slope are as follows:

   i. Flat slopes and up to 10% - no reduction;

   ii. 10% to 20% - reduction in DIR value of 20%;

   iii. 20% to 30% - reduction in DIR value of 50%; and

   iv. >30% - specialist advice required.

f) Appropriate plant species are advised to be planted to assist with evapotranspiration.

12. Conversion of per cent grade, slope and gradient

Slope conversion table

Per cent grade (%)	**Slope angle** Degrees (°)	**Slope ratio (V:H)** Approximate gradient
5	2.8	1:20.0
10	5.7	1:10.0
15	8.5	1:6.7
20	11.3	1:5.0
25	14.0	1:4.0
30	16.7	1:3.3
35	19.3	1:2.9
40	21.8	1:2.5

Installation Guide for Wright Tanks Ltd ProTec 10 Wastewater Treatment system.

Thank you for choosing the ProTec Wastewater system.

This is a Biological Submerged Aeration growth media system and when installed correctly and looked after mindfully, it will serve you well.

Installation Heights:
-Installed ground level to base 2600 to 2650mm high/deep
-Diameter tank 2600mm
-Hole size to install 2750mm deep x 3x3 metre wide.

Add 100mm of clean/washed sand, screed bedding material perfectly level with no dips or high spots, so the finished hole depth is a maximum of 2650mm.

Install the tank and check for level and correct install height, adjust if required.

Please note, your riser lids should protrude above ground level, in excess of 25mm, to prevent any potential ground water intrusion under heavy rain conditions.

You may be best to pre-fill the primary with 3000 to 4000 litres of fresh water to prevent the tank from hydraulic lift, whilst sitting unconnected throughout the build.

Back fill with excavated soil or suitable material if the excavated soil is not suitable, to approximately ¾ level. At this point you will need to connect the transport line, then continue the backfilling procedure. You can lightly compact or let it naturally settle over time and top up as required.

LAA installation should be done as per engineers' design for each job as per instructions/report supplied by client.

Once the electrician has connected the power supply, turn the system on in the electrical box at the tank and ensure it is on at the meter board (up is on) in both applications.
Your system is pre-set and checked ready to go.

Should you experience a red-light situation, alarm or any suspected issues, please call the 0800 253 273 phone number also listed on the face plate of your systems electrical box.

Power Supply:
1x 2.5mm, 3 core single phase cable wired to the house meter board on a separate 16 or 20-amp flick switch.
(NOT AN RCD)
All the circuit breakers are supplied in the electrical box itself.
Should the system be installed greater than 20 metres from the dwelling, you may need to ask your electrician as they may wish to up spec the cable to 4mm or greater.

Invert Level:
Approximately 800mm from ground level to bottom of 100mm intake, see install diagram.
Or 1.8 from base to bottom of 100mm intake.

Please refer to the operational guide supplied, or visit our website for good operation practice and safe products.

t:0800 253 273 fax:06 353 3020
e: admin@wrighttanks.co.nz web: www.wrighttanks.co.nz
PO Box 4777 Palmerston North

WRIGHT TANKS LTD

Guidelines for the effective operation of your Wright Protec Wastewater Treatment Plan

Your new Wright Protec Wastewater Treatment Plant is designed to break down solids through bacterial processes. For this process to occur a HEALTHY system is paramount. Within a healthy septic system healthy bacteria forms and the breaking down of solids begins.

Many factors can hinder the growth of such bacteria from what is flushed down the toilets, sinks or down the outside drains, consideration is required before it goes down.

What not to put down!

Solvents – Paint – Petroleum Products – Chemicals – Chlorine – All Medicines – Cooking oils/Fat/Grease – Sanitary Products – Nappies – Wipes (Including flushable)

What goes down your laundry during a wash load can have major effects on the healthy bacteria, even though it says it's eco-friendly or grey water safe doesn't always make it so.

SAFE PRODUCTS	RECOMMENDED WHAT NOT TO USE
Persil liquid	Charge
Dynamo	Cold water surf
Cold power liquid	FAB
New Generation	Persil
Earthwise liquid	Reflect
Eco store liquid	Bleach
Cold power powder	Vanish Napisan
	New Improved Persil liquid

Heavy chemicals, bleaches and excessive soap powder usage should be avoided, your system is a living environment and requires some restraint and care to remain heathy.

Please ensure your electrician wires your septic system on a separate 16 or 20 amp switch (NOT AN RCD). If there is any confusion please phone Wright tanks directly on 0800 253 273.

Your system leaves our factory pre-set and checked, as long as your electrician leaves it switched on, the system is ready to start up itself.

If you experience a "RED LIGHT" on the electrical box, please contact our office so Wright tanks can attend the issue quickly, this may safe guard from any damage occurring in your system.

Your Protec requires servicing at 6 month intervals, we are on call and can offer you a service contract if required when outside your initial warranty/service contract expiry date.

If you have leaking taps, toilets or any other overflows that drain into the septic tank they must be reported immediately for repair.

If you have any queries please feel free to call or email

t:0800 253 273 fax:06 353 3020
e: admin@wrighttanks.co.nz web: www.wrighttanks.co.nz
PO Box 4777 Palmerston North

WRIGHT TANKS LTD

Testing information on The Wright ProTec 10,000 Wastewater Treatment Plant

HAWKE'S BAY REGIONAL COUNCIL
HAWKE'S BAY
REGIONAL COUNCIL
APPROVED
DESIGNER
ANDREW WRIGHT
Domestic on-site wastewater treatment systems

NZCTMA
APPROVED

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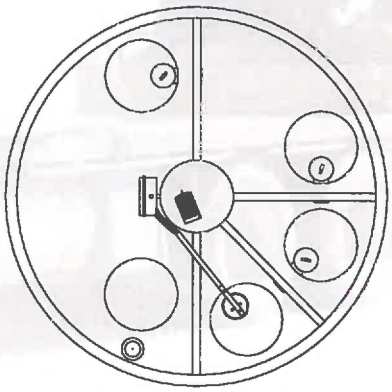
PO Box 4777 Palmerston North

WRIGHT TANKS LTD

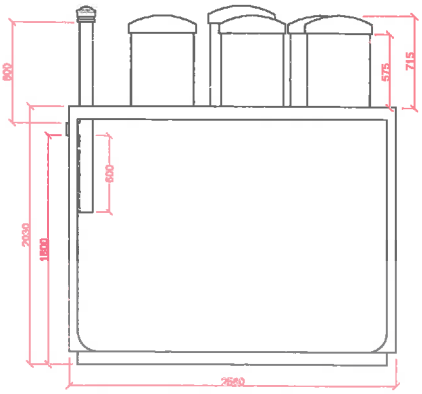
The Wright ProTec 10,000 Wastewater Treatment Plant

The Wright ProTec 10,000 Wastewater Treatment Plant treats effluent to a superior quality. It is Ideal for use in environmentally sensitive locations, or locations where a high water table level exists.

Key aspects of the Wright ProTec 10,000 Wastewater Treatment Plant.



Utilization of the latest developments in effluent filter technology
Proven aeration and treatment technology
Advanced design
Single tank system
Shock dose buffering
Holiday mode available
Concrete construction
High quality of treated effluent
Inexpensive and maintenance efficient
Treats up to 2,100L per day of wastewater
Designed to cater for kitchen waste disposal units
Suited for domestic and small commercial properties
Prompt and on going support from Wright Tanks Limited
No sloth-off maintenance like trickle down textile filter sewage systems
Treated effluent can be used to irrigate gardens, trees, lawns and shelter belts
Each internal chamber is sealed form the others, no chance of cross contamination
Full self dialing alarm telemetry available



HAWKE'S BAY REGIONAL COUNCIL
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APPROVED
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ANDREW WRIGHT
Domestic on-site wastewater treatment systems

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Datacomms Plus Ltd
Communication and Network Cabling Specialists

PO Box 4565
Palmerston North
Phone (06) 357-6070
Fax (06) 357-6071
Mobile (027) 435-7689

Wright Tanks
Rangitikei Street
Palmerston North

6th December 2010

Electrical Meter Reading

Dear Customer,

As an Independent Registered Electrician I have carried out a power consumption test on a Wright tanks septic system (This test was completed on a 4 bedroom house with 5 occupants). Below are the calculations on the amount of power used on a given week. The price per Kwh was given by energy provider on a standard rate for most residential houses including the new price increase.

Readings

- Reading of week's power consumption 12.4 Kwh.
- Genesis standard rate per Kwh 20.47 cents.
- Amount per week = $2.53.
- Amount per day = 36 cents.

Ben Newman
DatacommsPlus
0274357002

Hawke's Bay Regional Council
159 Dalton St
Private Bag 6003
Napier 4142, New Zealand
Tel 06 835 9200
Fax 06 835 3601
Freephone 0800 108 838
www.hbrc.govt.nz

Our Ref: 15/1/9

16 August 2011

Wright Tanks Ltd
P. O. Box 4777
PALMERSTON NORTH 4442

Dear Andy

SAMPLING OF WRIGHT TANKS PROTEC 10000 WASTEWATER TREATMENT SYSTEMS BY THE HAWKES BAY REGIONAL COUNCIL

Thank you for allowing Council to carryout sampling of **WRIGHT TANKS PROTEC 10000** wastewater treatment systems. Nineteen samples were taken from eight systems. The units were all servicing domestic dwellings. The samples were taken and analysed by Central Environmental Laboratories, Palmerston North.

Issuing of resource consents for the discharge from waste water treatment systems in Hawkes Bay is conditional upon the manufacturer agreeing to the specified model being sampled by the Council, and the aggregated BOD_5 and TSS results from that testing meeting the following criteria:

50% of the samples taken shall be less than 30gm/m^3; and
75% of the samples taken shall be less than 40gm/m^3.

I am pleased to report that the sample analysis results meet the criteria set by Council.

Yours sincerely

K. J. Peacock

KEITH PEACOCK
TEAM LEADER - COMPLIANCE
RESOURCE MANAGEMENT GROUP
Phone: (06) 833 8097
Mobile: 027 208 3384
Email: keith@hbrc.govt.nz

CENTRAL ENVIRONMENTAL LABORATORIES
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Batchelar Road
Palmerston North, New Zealand

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Analytical Report

COA No: 09/01019-1

Wright Tanks Ltd
P O Box 4777
PALMERSTON NORTH 4442
Attention:

Date received: 27/02/2009 **Time received:** 13:30:00 **Sampled by:** Client **Sample date:** 27/02/2009
Sample time: 13:00:00

Sample	Sample ID	Test	Result	Units
09/01019-01	Sample A			
	Sewage	BOD inhibited	11	g/m³
		Nitrate	0.119	g/m³ NO3-N
		Suspended solids	6	g/m³

Notes:

Report released by Lee Odlin Date: 10 March 2009
Laboratory Manager

Signatories:
Daniel Chick
Malcolm Daley

This Laboratory is accredited by International Accreditation New Zealand.
Tests as reported have been performed in accordance with the conditions of our accreditation.
Tests which have been subcontracted can be found in the attached report. Test methods, detection limits and uncertainties are available on request.
The results reported apply only to the sample as received at the Laboratory.
This report shall not be reproduced except in full, without the written approval of this laboratory.

CENTRAL ENVIRONMENTAL LABORATORIES
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Analytical Report

COA No: 09/03824-1

Wright Tanks Ltd
P O Box 4777
PALMERSTON NORTH 4442
Attention: Andrew Wright

Date received: 07/08/2009 **Time received:** 17:00:00 **Sample date:** 07/08/2009 **Sample time:** 13:30:00

Sample	Sample ID	Test	Result	Units
09/03824-01	Sewage Sample C	Carbonaceous BOD Suspended solids	< 6 7	g/m³ g/m³

Notes:

Report released by Johan Bosch **Date:** 19 August 2009
Laboratory Manager

Signatories:
Malcolm Daley

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Analytical Report

COA No: 09/03705-1

Wright Tanks Ltd,
P O Box 4777
PALMERSTON NORTH 4442
Attention: Andrew Wright

Date received: 31/07/2009 **Time received:** 15:30:00 **Sampled by:** Client **Sample date:** 31/07/2009
Sample time: 15:05:00

Sample	Sample ID	Test	Result	Units
09/03705-01	Sewage Site C	Carbonaceous BOD	< 6	g/m³
		Suspended solids	4	g/m³

Notes:

Report released by Johan Bosch **Date:** 10 August 2009
Laboratory Manager

Signatories:
Malcolm Daley

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Analytical Report

COA No: 09/01419-1

Wright Tanks Ltd
P O Box 4777
PALMERSTON NORTH 4442
Attention.

Date received: 19/03/2009 **Time received:** 13:10:00 **Sampled by:** Client **Sample date:** 18/03/2009
Sample time: 12:15:00 **Order no.:** Site A

Sample	Sample ID	Test	Result	Units
09/01419-01	Site A Sewage	Faecal coliforms	2300	MPN / 100 mL

Notes:

Report released by Lee Odlin **Date:** 23 March 2009
Laboratory Manager

Signatories:
Becky Demchick

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accredited laboratory

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Analytical Report

COA No: 09/01871-1

Wright Tanks Ltd,
P O Box 4777
PALMERSTON NORTH 4442
Attention:

Date received: 14/04/2009 **Time received:** 12:55:00 **Sampled by:** Client **Sample date:** 14/04/2009
Sample time: 12:00:00

Sample	Sample ID	Test	Result	Units
09/01871-01	Sewage Site A	Faecal coliforms	4900	MPN / 100 mL

Notes:

Report released by Lee Odlin **Date:** 20 April 2009
Laboratory Manager

Signatories:
Becky Demchick

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Tests as reported have been performed in accordance with the conditions of our accreditation.
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Palmerston North, New Zealand

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Analytical Report

COA No: 11/03330-1

Wright Tanks Ltd,
P O Box 4777
PALMERSTON NORTH 4442
Attention: Andrew Wright

Date received: 29/09/2011 **Time received:** 16:05:00 **Sampled by:** Andy **Sample date:** 29/09/2011
Sample time: 14:30:00 **Sample type:** Effluent

Sample	Sample ID	Test	Result	Units
11/03330-01	Manakau Pub	Carbonaceous BOD **	6	g/m³
	Manakau	Suspended solids	4	g/m³

Notes: ** This test has been outsourced. Subcontracted reports can be supplied on request.

Test Methodology:

Test	Methodology	Detection Limit
Carbonaceous BOD	APHA 21st Ed. 5210 B	1 g/m³
Total Nitrogen	APHA 21st Ed. 4500-P J and 4500-NO2 B	0.05 g/m³
Suspended solids	APHA 21st Ed. 2540 D	1 g/m³

Report released by Graham Mason **Date:** 07 October 2011
General Manager

Signatories:
Johan Bosch

This Laboratory is accredited by International Accreditation New Zealand.
Tests as reported have been performed in accordance with the conditions of our accreditation.
Tests which have been subcontracted can be found in the attached report. Test methods, detection limits and uncertainties are available on request.
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Analytical Report

COA No: 11/02167-1

Wright Tanks Ltd,
P O Box 4777
PALMERSTON NORTH 4442
Attention: Andrew Wright

Date received: 24/06/2011 **Time received:** 14:50:00 **Sampled by:** Andy **Sample date:** 24/06/2011
Sample time: 13:50:00 **Sample type:** Effluent

Sample	Sample ID	Test	Result	Units
11/02167-01	Workshop	Carbonaceous BOD **	< 6	g/m³
		Total Nitrogen	38	g/m³
		Suspended solids	5	g/m³

Notes: ** This test has been outsourced. Subcontracted reports can be supplied on request.

Test Methodology:

Test	Methodology	Detection Limit
Carbonaceous BOD	APHA 21st Ed. 5210 B	g/m³
Total Nitrogen	APHA 21st Ed. 4500-P J and 4500-NO2 B	0.05 g/m³
Suspended solids	APHA 21st Ed. 2540 D	1 g/m³

Report released by Graham Mason **Date:** 05 July 2011
General Manager

Signatories:
Johan Bosch

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On-site Effluent Treatment National Testing Programme (OSET NTP)

PERFORMANCE CERTIFICATE
Wright ProTec 10000 On-site Domestic Wastewater Treatment System, OSET NTP Trial 10, 2014/2015

System Tested
The **Wright ProTec 10000 system** is a Submerged Aerated Filter Wastewater Treatment Plant using SAGM 370L growth media in the aeration tank as the submerged fixed growth filter system. The manufacturers rated design capacity is 2,100 litres/day. Total operational liquid volume is 8,400 litres (Primary Chamber 4,500 litres; Aeration Chamber 2,100 litres; Clarifier 1,200 litres; Pump Chamber 1,200 litres; Emergency storage 616 litres). No tertiary treatment (such as UV disinfection) is incorporated. It comprises a single 4 chamber tank. The air blower is HA 002/221 CEG-145 Lpm running continuously to a fine bubble air diffuser (FlexAir TO4, 250mm disc) and an airlift pump providing 3:1 recirculation for nitrogen removal. There is a GT 150 (1mm) filter in both the Primary Chamber and Aeration Chamber plus a GT 500 (300 micron) filter after the Final Clarifier. The manufacturers stated service frequency is 6 monthly.

Test Flow Rate
The **Wright ProTec 10000 system** was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2014 to July 2015 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 2 weeks.

Testing and Evaluation Procedures
A total of 37 treated effluent samples of organic matter (BOD_5) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2012.
A total of 16 treated effluent samples of organic matter (BOD_5), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH_4-N), total phosphorus (TP) and faecal coliforms (FC) at generally six day intervals during weeks 23 through 35 were tested and the results benchmarked and rated on their median values. In addition, the energy used by the treatment system was assessed on the mean of consumption levels over the 16 sample days.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements
These requirements are that 90% of all test samples must achieve a BOD_5 of $\leq$ 20 g/m^3 and TSS of $\leq$ 30 g/m^3 with no one result for BOD_5 being >30 g/m^3 and no one result for TSS being >45 g/m^3. Based on the full set of 37 test results in weeks 9 to 35 the **Wright ProTec 10000 system failed both the Maximum and 90%ile BOD_5 requirements and failed the 90%ile TSS requirements so did not achieve AS/NZS 1547 secondary effluent quality performance requirements.** The **Wright ProTec 10000 system** thus **failed** the secondary effluent quality requirements of AS/NZS 1547:2012 at the test flow rate of 1,000 L/day (ie at 48% of the plants advised design capacity). [However, it should be noted that if only the 24 results between Weeks 18-35 (subsequent to repair of the incorrectly wired aeration pump) were considered then the Wright ProTec plant would have passed all AS/NZS 1547 secondary effluent quality performance requirements at the test flow rate].

Benchmark Ratings
The **Wright ProTec 10000 system achieved** the following effluent quality ratings for the sixteen benchmarking results in weeks 20 - 35.

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD (mg/L)	*7*	*2.8*	A	<5	<10	<20	<30	≥30
TSS (mg/L)	*14*	*5.7*	B	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	*33.8*	*1.5*	D	<5	<15	<25	<30	≥30
NH_4- Nitrogen (mg/L)	*13.2*	*6*	C	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	*4*	*0.5*	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	*28,000*	*81,000*	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	*1.7*	*0.3*	B	0	<1	<2	<5	≥5

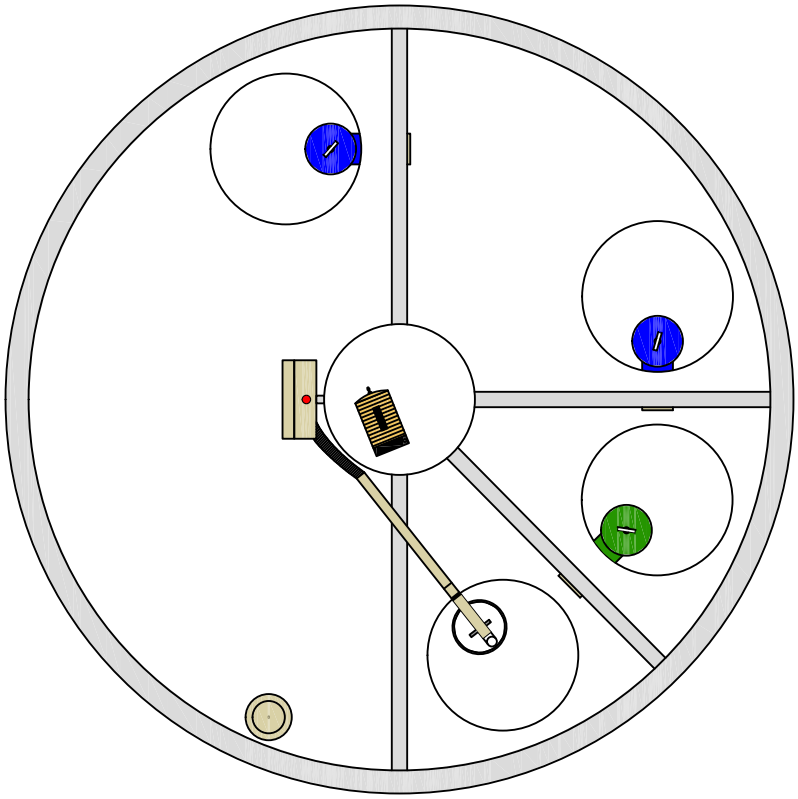
This Performance Certificate is specific to the **Wright ProTec 10000** model as specified above when operated at a flow rate of 1,000 litres/day (48% of advised plants design capacity), and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **Wright ProTec 10000 system** contact **Wright Tanks Ltd**, Palmerston North, P: **0800 253 273**, or E: andrew@wrighttanks.co.nz .

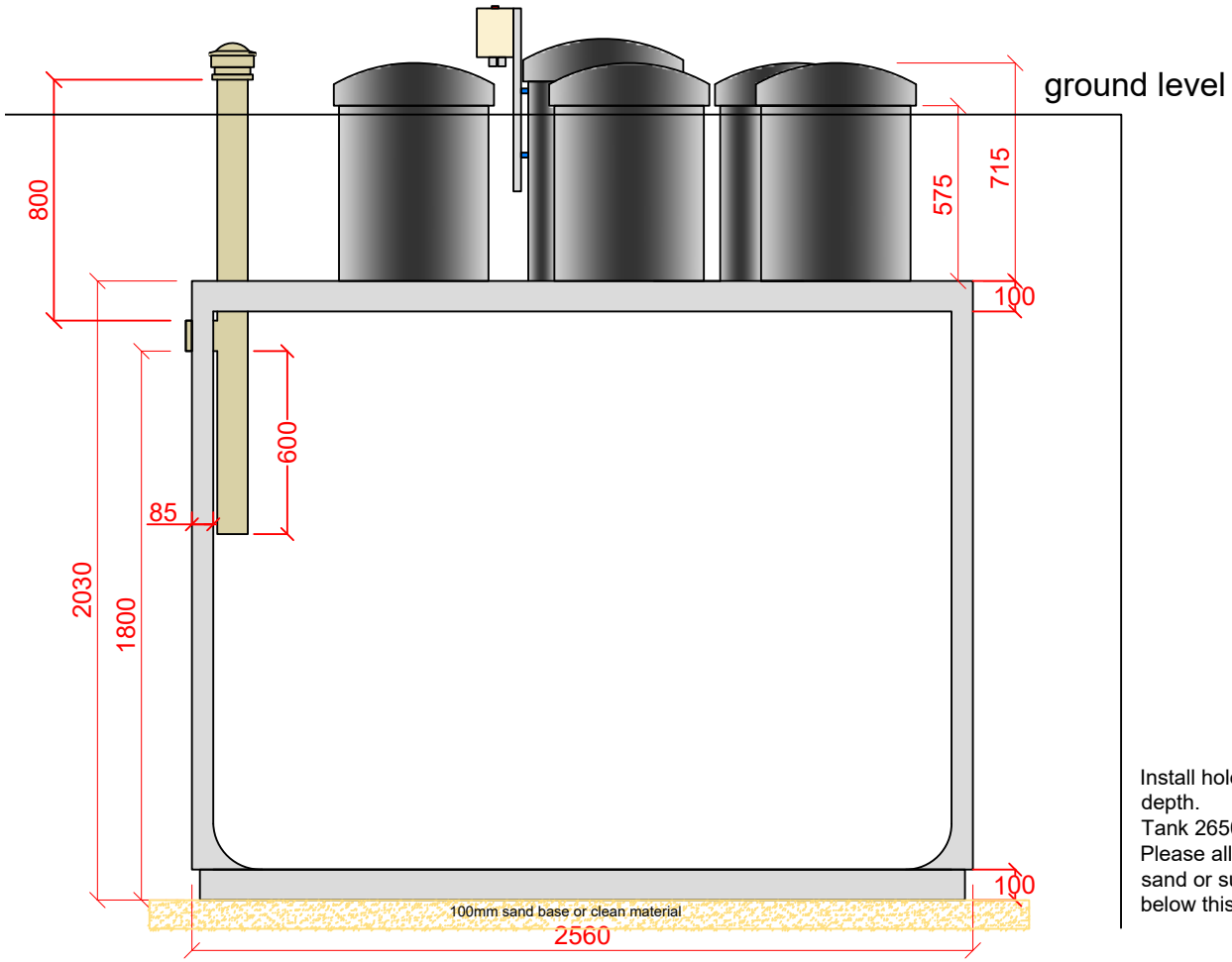
Authorised By:

Ray Hedgland, Technical Manager, OSET NTP
1 February 2016

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 2/12 Mt Blanc Pl, Northpark, Howick, AUCKLAND 2013 Mob: 021 626 772 E-mail: ray@hedgland.co.nz

ProTec 10 WWTP





Install hole depth.
Tank 2650mm.
Please allow 100mm of sand or suitable material below this.

Design Navigator H1 Compliance Report

Project Summary

H1 Report created by:	Homeworx Design and Build Limited
Project Name:	Schmidli Home
Client:	Christine and Kurt Schmidli
Lot No:	Lot 1 DP 522712
Comment:	
Project Id:	119256
Report Date:	16/01/2019

Compliance Result

This report shows compliance of the design with Clause H1 Fourth edition Amendment 3 from January 2017 and the R-value targets of Clause E3 Second edition Amendment 6 from January 2017.

This building complies with H1 via the following methods:

- the Schedule Method in NZS4218:2009
- the Calculation Method in NZS4218:2009
- the BPI Method

H1 Compliance Details

NZS4218:2009 Schedule Method Compliance

The use of the Schedule Method is permitted .

In order to comply the R-values for all the construction elements must be the same or larger than the permitted minimum R-values. This design **complies** with the NZS4218:2009 Schedule Method.

Non-Solid Construction

	Permitted Minimum	Proposed Minimum	
Floor:	1.3		✓
Non-solid Walls:	1.9	2.11	✓
Glazing in Non-solid Walls:	0.26	0.26	✓
Roof:	2.9	3.31	✓
Skylights:	0.26		✓

Notes:
If multiple solid wall types levels are used the table shows the requirements for the corresponding walls and windows in them. For solid timber and for other solid constructions two options are shown for each. But the components of these options can not be mixed, i.e. it is not permitted to use the solid timber wall R-value from option 1 and the solid timber window R-value from option 2.

NZS4218:2009 Calculation Method Compliance

The use of the Calculation Method is permitted .

In order to comply the Actual Heat Loss must be the same or smaller than the Reference Heat Loss AND all component R-values must be the same or larger than 50% of the R-values in the '50% Rule' table below. This design **complies** with the

NZS4218:2009 Calculation Method.

HeatLoss:

Reference building	Proposed building
496	359

Minimum R-values ("50% rule"):

	Permitted Minimum	Proposed Minimum	
Floor:	0.65		✓
Non-solid Walls:	0.95	2.11	✓
Roof:	1.45	3.31	✓

The Reference building has the following areas and R-values.

					Non-solid	Solid Timber	Other Solid
					100.0	0.0%	0.0%
Floor:	Area:	0	m²	R-values:	1.3	1.3	1.5
Walls excl. glazing:	Area:	198.5	m²	R-values:	1.9	1.2	1
Glazing (up to 30%):	Area:	85.1	m²	R-values:	0.26	0.26	0.26
Glazing (surplus of 30%):	Area:	0	m²	R-values:	0.4	0.34	0.31
Roof:	Area:	186.2	m²	R-values:	2.9	3.5	3.5
Heat Loss:					496	546	579

For mixed constructions the heat loss of the reference building is calculated as the sum of the heat losses for each type of wall construction multiplied by the fraction of the wall area of each type. This approach is based on clause 4.2.6 of NZS4218:2009.
There are no skylights in the reference building. The reference building roof area is the sum of the proposed building roof and skylight areas.

Building Performance Index Compliance

The use of the Building Performance Index (BPI) method is permitted .

This design complies with the BPI.

In order to comply the design must have a BPI smaller or equal to 1.55 kWh/DegMonth.m². Your building has a BPI of 0.96 kWh/DegMonth.m².

The normalised annual heating energy use of this design is 6460 kWh.

Please refer to www.designnavigator.co.nz/BPICorrelation.pdf regarding the recognition of the BPI for NZBC compliance verification.

Compliance with Clause E3

This building complies with the R-value targets in NZBC Clause E3 .

Component	Minimum R-value	Project R-value
Framed wall constructions with cavities	1.5	
Single skin masonry wall without a cavity	0.6	
Solid timber wall no less than 60 mm thick	0.6	
Roof or ceilings	1.5	

Design Details

Building Dimensions

Floor Area	0	m²
Gross Wall Area	283.6	m²
Net Wall Area	233.7	m²
Wall (North) Area	18.2	m²
Wall (East, South and West) Area	215.5	m²
Gross Roof Area	186.2	m²
Net Roof Area	186.2	m²
Glazing Area	49.9	m²
Window (North) Area	15.8	m²
Window (East, South and West) Area	34.1	m²
Skylight Area	0	m²

Glazing Areas

Total Vertical Glazing Percentage	17.6	%
East, South and West Window Percentage	13.7	%
Total over 30%	no	
East, South and West over 30%	no	
Total over 50%	no	
max. Skylight Area for Schedule Method	2.79	m²
Skylights over Schedule Method Limit	no	
Decorative Glazing	0	m²
Decorative Glazing over 3m²	no	

Information required for BPI calculation

Living Floor Area	110.3	m²	Note: This includes also internal floors.
Average Room Height	2.6	m	
Thermal Mass Level	Medium weight		Slab floor with some carpeting or direct glued timber, timber framed walls.

Climate

Location	Napier
Climate Zone	2

Heat Loss Details

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
Floors										
Walls										
Wall 1	North Abodo ga	N	10.2	2.4	24.5	15.7	2.19	7.2		C
Window 1-1	Windows		8.8	1.0		8.8	0.26	33.8	0.58	
Wall 2	North Axon pan	N	4.0	2.4	9.6	2.6	2.11	1.2		C
Window 2-1	Windows & Doo		7.0	1.0		7.0	0.26	27.1	0.58	
Wall 3	East Axon pane	E	41.4	2.4	99.5	80.2	2.11	38.0		C
Window 3-1	Windows & Doo		19.3	1.0		19.3	0.26	74.1	0.58	
Wall 4	South Abodo	S	4.0	2.4	9.6	5.8	2.19	2.7		C
Window 4-1	Windows & Doo		3.8	1.0		3.8	0.26	14.5	0.58	
Wall 5	South Axon pan	S	10.7	2.4	25.7	25.7	2.14	12.0		C
Wall 6	West Axon Pan	W	47.9	2.4	114.9	103.8	2.11	49.2		C
Window 6-1	Windows & Doo		11.1	1.0		11.1	0.26	42.6	0.58	
Roofs										
Roof 1	Corrugate roof				186.2	186.2	3.31	56.3		
Total Heat Loss								358.6		

* Any concrete slab-on-ground floor regardless of its dimensions can be assumed to have an R-value of at least R-1.3 (H1/AS1 2.1.5).
** The Shading Coefficient is only required for BPI calculations.
*** C: Cavity Construction (any construction that is not solid), T: Solid Timber, S: Other Solid Construction (Note that the use of solid timber and other solid construction types is discretional, i.e. solid timber walls and other solid walls can be treated as if they are non-solid (NZS4218:2009 section 4.1.3.).)

Wall Construction Details

Name: Axon panel walls — 2.11 m²°C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : Fibre cement board 1470 9mm *R-value: 0.04*	
Air Barrier : James Hardie HomeRAB Precladding - 4mm *R-value: 0.02*	
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 R2.6 Wall 2.6
	still Airgap: none *R-value: 0.00*
Wall Lining : Gypsum plasterboard 10mm *R-value: 0.04*	
internal surface 0.09	

Name: Abodo walls — 2.19 m²°C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : Vertical weatherboard *R-value: 0.16*	
Air Barrier : James Hardie HomeRAB Precladding - 4mm *R-value: 0.02*	
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 R2.6 Wall 2.6
	still Airgap: none *R-value: 0.00*
Wall Lining : Gypsum plasterboard 10mm *R-value: 0.04*	
internal surface 0.09	

Roof Construction Details

Name: Corrugate roof

3.31 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

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 10mm
R-value: 0.04

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 186.2 Number of downlights: 30 Clearance from lamp holder side [m]:

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	Schmidli Home
Street and Number:	50 Silverton Road
Lot and DP Number:	Lot 1 DP 522712
City/Town/District:	Napier
Designer:	Annalisa Pol
Company:	Homeworx
Date:	07.01.19

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	28
Roof Height above Eaves (m)	1.7
Building Height to Apex (m)	4.3
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	10.57
Building Width (m)	8.72
Building Plan Area (m²)	58.2

Building Location

Wind Zone = Extra High

Earthquake Zone 3

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**698**	**718**

Bracing Units required for Earthquake

	Along & Across
Single Level	**314**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									698	314
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1476 211%	1298 413%
N	5	1.00		2.4	GS1-N	GIB®	65	60		
	6	0.80		2.4	JHDgn	RAB	55	51		
									120 OK	111 OK
O	1	3.60		2.4	JHDn	RAB	425	367		
	2	1.20		2.4	JHDn	RAB	142	122		
	3	0.82		2.4	GS1-N	GIB®	50	48		
	4	0.80		2.4	JHDgn	RAB	55	51		
	5	0.74		2.4	JHDgn	RAB	51	47		
									723 OK	637 OK
P	1	0.96		2.4	JHDgn	RAB	66	61		
	2	3.60		2.4	JHDn	RAB	425	367		
	3	1.20		2.4	JHDn	RAB	142	122		
									633 OK	551 OK

Single Level Across Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									718	314
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1188 165%	1071 341%
E	1	0.74		2.4	JHDgn	RAB	51	47		
	2	0.74		2.4	JHDgn	RAB	51	47		
	3	4.70		2.4	JHDn	RAB	555	479		
									657 OK	574 OK
F	1	0.83		2.4	BL1-H	GIB®	91	85		
	2	0.40		2.4	JHDgn	RAB	28	26		
	3	0.40		2.4	JHDgn	RAB	28	26		
	4	0.74		2.4	BLG-H	GIB®	99	94		
	5	0.83		2.4	BL1-H	GIB®	91	85		
									336 OK	315 OK
G	1	1.30		2.4	JHD	RAB	195	182		
									195 OK	182 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Ecoply	EP1 0.4	0.4	80	95
RAB	JHDn	1.2	118	102
RAB	JHD400	0.4	83	107
RAB	JHD600	0.6	99	107
RAB	JHD1200	1.2	154	140
RAB	JHD2400	2.4	135	150
Homerab	HPn	1.2	67	71
Homerab	HP400	.4	85	91
Homerab	HP600	.6	99	103
Homerab	HP1200	1.2	133	104
Homerab	HP2400	2.4	141	67
Ecoply	EP1	0.6	130	130
Homerab	HPgn	.4	73	66
RAB	JHDgn	.4	69	64
RAB	JHD	1.2	154	140

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	Schmidli Home
Street and Number:	50 Silverton Road
Lot and DP Number:	Lot 1 DP 522712
City/Town/District:	Napier
Designer:	Annalisa Pol
Company:	Homeworx
Date:	07.01.19

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	28
Roof Height above Eaves (m)	1.7
Building Height to Apex (m)	4.3
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	16.45
Building Width (m)	6
Building Plan Area (m²)	91.58

Building Location

Wind Zone = Extra High

Earthquake Zone 3

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**507**	**1077**

Bracing Units required for Earthquake

	Along & Across
Single Level	**494**

Single Level Along Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									507	494
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1071 211%	940 190%
M	1	2.40		2.4	JHDn	RAB	283	245		
	2	1.20		2.4	JHDn	RAB	142	122		
	3	2.40		2.4	JHDn	RAB	283	245		
	4	0.80		2.4	JHDgn	RAB	55	51		
									763 OK	663 OK
N	1	0.96		2.4	JHDgn	RAB	66	61		
	2	1.20		2.4	JHDn	RAB	142	122		
	3	0.90		2.4	JHDgn	RAB	62	58		
	4	0.55		2.4	JHDgn	RAB	38	35		
									308 OK	277 OK

Single Level Across Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									1077	494
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1535 143%	1357 275%
A	1	6.00		2.4	JHDn	RAB	708	612		
									708 OK	612 OK
B	1	3.50		2.4	GS1-N	GIB®	242	210		
									242 OK	210 OK
C	1	2.50		2.4	GS1-N	GIB®	173	150		
									173 OK	150 OK
D	1	2.50		2.4	JHD	RAB	375	350		
	2	0.55		2.4	JHDgn	RAB	38	35		
									413 OK	385 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Ecoply	EP1 0.4	0.4	80	95
RAB	JHDn	1.2	118	102
RAB	JHD400	0.4	83	107
RAB	JHD600	0.6	99	107
RAB	JHD1200	1.2	154	140
RAB	JHD2400	2.4	135	150
Homerab	HPn	1.2	67	71
Homerab	HP400	.4	85	91
Homerab	HP600	.6	99	103
Homerab	HP1200	1.2	133	104
Homerab	HP2400	2.4	141	67
Ecoply	EP1	0.6	130	130
Homerab	HPgn	.4	73	66
RAB	JHDgn	.4	69	64
RAB	JHD	1.2	154	140

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	Schmidli Home
Street and Number:	50 Silverton Road
Lot and DP Number:	Lot 1 DP 522712
City/Town/District:	Napier
Designer:	Annalisa Pol
Company:	Homeworx
Date:	07.01.19

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	1.7
Building Height to Apex (m)	4.3
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	17.6
Building Width (m)	14.7
Building Plan Area (m²)	149.6

SUPERSEDED

Building Location

Wind Zone = Extra High

Earthquake Zone 3

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**1119**	**1147**

Bracing Units required for Earthquake

	Along & Across
Single Level	**807**

Single Level Along Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									1119	807
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2227 199%	1934 240%
a	1	6.00		2.4	JHDn	RAB	708	612		
									708 OK	612 OK
b	1	3.50		2.4	GS1-N	GIB®	242	210		
									242 OK	210 OK
c	1	0.74		2.4	JHDgn	RAB	51	47		
	2	0.74		2.4	JHDgn	RAB	51	47		
	3	4.70		2.4	JHDn	RAB	555	479		
									657 OK	574 OK
d	1	2.50		2.4	GS1-N	GIB®	173	150		
									173 OK	150 OK
e	1	2.50		2.4	JHDn	RAB	295	255		
	2	1.30		2.4	JHDn	RAB	153	133		
									448 OK	388 OK

SUPERSEDED

Single Level Across Resistance Sheet

Job Name: Schmidli Home

									Wind	EQ
									Demand	
									1147	807
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2091 182%	1816 225%
m	1	3.50		2.4	JHDn	RAB	413	357		
	2	2.80		2.4	JHDn	RAB	330	286		
									743 OK	643 OK
n	1	0.96		2.4	JHDgn	RAB	66	61		
	2	1.50		2.4	JHDn	RAB	177	153		
	3	1.20		2.4	JHDn	RAB	142	122		
									385 OK	337 OK
o	1	3.70		2.4	JHDn	RAB	437	377		
									437 OK	377 OK
p	1	0.96		2.4	JHDgn	RAB	66	61		
	2	3.90		2.4	JHDn	RAB	460	398		
									526 OK	459 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Ecoply	EP1 0.4	0.4	80	95
RAB	JHDn	1.2	118	102
RAB	JHD400	0.4	83	107
RAB	JHD600	0.6	99	107
RAB	JHD1200	1.2	154	140
RAB	JHD2400	2.4	135	150
Homerab	HPn	1.2	67	71
Homerab	HP400	.4	85	91
Homerab	HP600	.6	99	103
Homerab	HP1200	1.2	133	104
Homerab	HP2400	2.4	141	67
Ecoply	EP1	0.6	130	130
Homerab	HPgn	.4	73	66
RAB	JHDgn	.4	69	64

SUPERSEDED

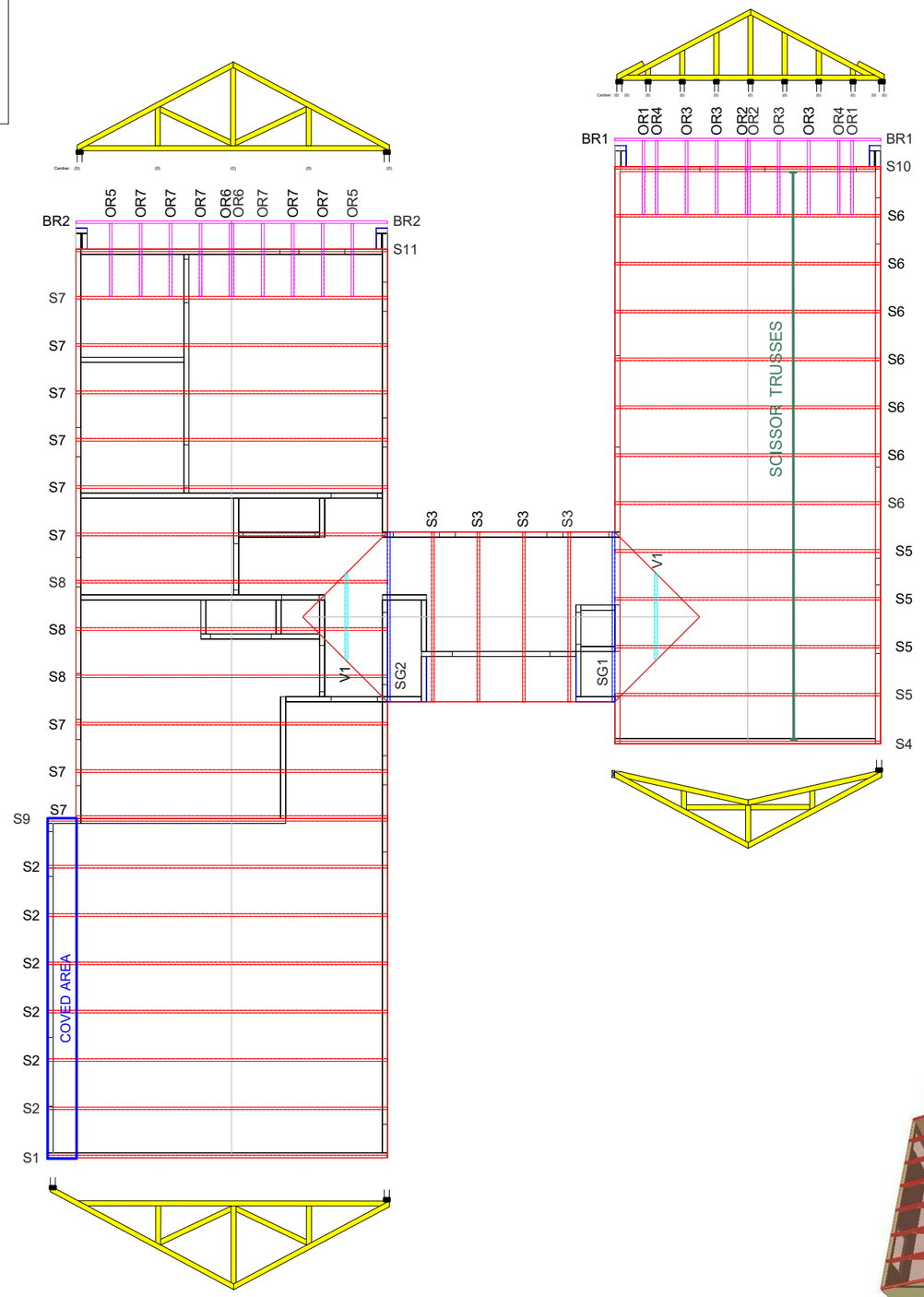
BUILDING CONSENT INFORMATION :

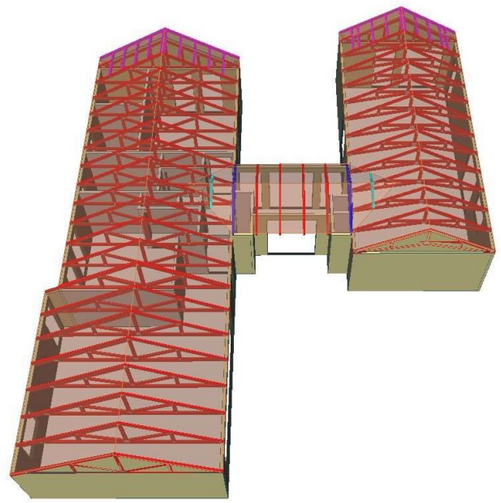
These layouts and associated design statements are provided as a means of showing compliance with NZBC and may be used for Building Consent purposes only.

This is a Buildable Layout that may have dimensional changes made at time of manufacture.

All exterior walls and solid interior walls shown on this layout are considered load bearing.

All point loads over 8kN shown and may require slab/pad thickening or pile.





BUILDABLE LAYOUT FOR CONSENT

Tumu Frame & Truss
1300 Omahu Rd
Hastings
Ph: 06 879 7850
Fax: 06 879 6468

Friday, 11 January 2019

Roofing	: Longrun
Pitch	: 28.00 Deg.
Spacing	: 900
Design Wind Velocity	: 55.00 m/s (Ult.)
Detailer	: Jason Horne
Overhang	:
Fascia Type	:
Truss Timber Treatment:	

Dimensions shown are overall frames. Running dimensions are from outside of frame to face of truss.
Double trusses to be gun nailed together @ 250crs (staggered) in chords and webs (1 row for timber widths up to 100mm, 2 rows up to 200mm, otherwise 3 rows)

Disclaimer:
Tumu Frame & Truss will not consider any claims for the correction of any pre-cut errors unless prior consultation has taken place and approval for the error has been agreed.

Tumu Frame & Truss do not agree to pay for any waiting time.

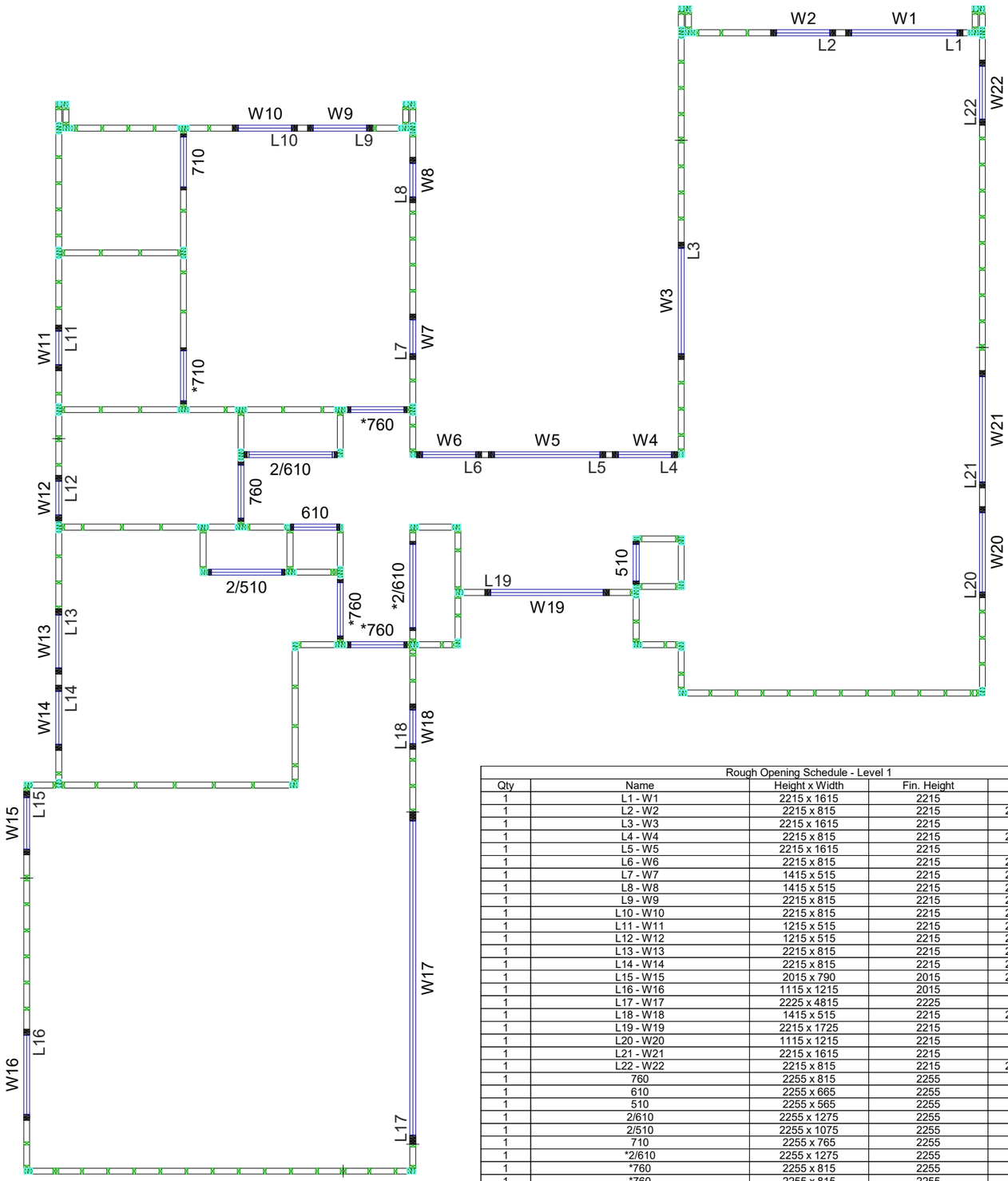
MAX TRUSS SIZE =
TRUSS CUBE =
ROOF PACK =

Customer : Homeworx
Site Address : C & K Schmidli
: 50 Silverton Rd, Poraiti

Job Ref: 3956C

pryda

LINTEL LAYOUT



Rough Opening Schedule - Level 1				
Qty	Name	Height x Width	Fin. Height	Lintel Size
1	L1 - W1	2215 x 1615	2215	1-PLL150
1	L2 - W2	2215 x 815	2215	2-90x45 hyCHORD H12
1	L3 - W3	2215 x 1615	2215	1-PLL150
1	L4 - W4	2215 x 815	2215	2-90x45 hyCHORD H12
1	L5 - W5	2215 x 1615	2215	1-PLL150
1	L6 - W6	2215 x 815	2215	2-90x45 hyCHORD H12
1	L7 - W7	1415 x 515	2215	2-90x45 hyCHORD H12
1	L8 - W8	1415 x 515	2215	2-90x45 hyCHORD H12
1	L9 - W9	2215 x 815	2215	2-90x45 hyCHORD H12
1	L10 - W10	2215 x 815	2215	2-90x45 hyCHORD H12
1	L11 - W11	1215 x 515	2215	2-90x45 hyCHORD H12
1	L12 - W12	1215 x 515	2215	2-90x45 hyCHORD H12
1	L13 - W13	2215 x 815	2215	2-90x45 hyCHORD H12
1	L14 - W14	2215 x 815	2215	2-90x45 hyCHORD H12
1	L15 - W15	2015 x 790	2015	2-90x45 hyCHORD H12
1	L16 - W16	1115 x 1215	2015	1-PLL150
1	L17 - W17	2225 x 4815	2225	1-240x90 hyONE H12
1	L18 - W18	1415 x 515	2215	2-90x45 hyCHORD H12
1	L19 - W19	2215 x 1725	2215	1-PLL150
1	L20 - W20	1115 x 1215	2215	1-PLL150
1	L21 - W21	2215 x 1615	2215	1-PLL150
1	L22 - W22	2215 x 815	2215	2-90x45 hyCHORD H12
1	760	2255 x 815	2255	(None)
1	610	2255 x 665	2255	(None)
1	510	2255 x 565	2255	(None)
1	2/610	2255 x 1275	2255	(None)
1	2/510	2255 x 1075	2255	(None)
1	710	2255 x 765	2255	(None)
1	*2/610	2255 x 1275	2255	(None)
1	*760	2255 x 815	2255	(None)
1	*760	2255 x 815	2255	(None)
1	*710	2255 x 765	2255	(None)
1	*760	2255 x 815	2255	(None)

TUMU FRAME & TRUSS

Tumu Frame & Truss
1300 Omahu Rd
Hastings
Ph: 06 879 7850
Fax: 06 879 6468

FTMA NEW ZEALAND

Friday, 11 January 2019

Detailer : Jason Horne
Wind : 55.00 m/s (Ult.)
Cladding :

Ext Frame :
Ext B/Plates :
Int Frame :
Int B/Plates :
Wet Areas :

Standard Ext Stud crs :
Standard Ext Nog crs :
Standard Int Stud crs :
Standard Int Nog crs :

Metal Braces :
Ply Braces :

150x40 Strapping over :

BUILDER TO CHECK ALL DIMENSIONS, OPENING POSITIONS, TRIMS, LINTELS & BRACES etc., ON SITE BEFORE LINING.

ALL JOINERY TO BE SITE MEASURED. (Windows & Doors may have changed)

ALL STEELWORK TO BE SITE MEASURED. (No assumptions to be made by steel fabricator that information supplied on this prenail plan is accurate in terms of length, height & exact location)

BUILDER TO READ PRENAIL PLAN IN CONJUNCTION WITH ARCHITECTUAL PLANS.

MAX FRAME SIZE =
PRENAIL CUBE =
BEAMS & STUDS CUBE =
TOTAL DELIVERY =
4N5 STRAPNAILS =

Customer : Homeworx
Site Address : C & K Schmidli
: 50 Silverton Rd, Poraiti

Level:

Job Ref: 3956C

Tumu Frame & Truss
Stortford Lodge, PO Box 2308, Hastings, , Ph (06) 879-7850, Fax (06) 879-6468

Component Summary Report

Level 1

Nominal Wall Height = 2465 mm

Lintel And Jamb Stud Summary

Label	Opening Width (mm)	Opening Hight (R) or (L) (mm)	Lintel		Jamb Stud (LEFT)				Jamb Stud (RIGHT)			
			Size	Defl. (mm)	Size	Min. Bearing (mm)	Reactions (kN)		Size	Min. Bearing (mm)	Reactions (kN)	
							Down	Uplift			Down	Uplift
L1	1615	2100 (L)	1 / 140x90 GL8H12	-0.3	2 / 45x90 JFLVL8H12	35.0	2.3	-2.2	2 / 45x90 JFLVL8H12	35.0	2.3	-2.2
L2	815	2100 (L)	2 / 90x45 hyCHORD H12	-0.1	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4
L3	1615	2100 (L)	1 / 140x90 GL8H12	-0.4	2 / 45x90 JFLVL8H12	35.0	3.2	-4.3	2 / 45x90 JFLVL8H12	35.0	2.9	-3.9
L4	815	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	4.1	-5.8	2 / 45x90 JFLVL8H12	35.0	0.7	-1.2
L5	1615	2100 (L)	1 / 140x90 GL8H12	-0.2	2 / 45x90 JFLVL8H12	35.0	0.8	-1.3	2 / 45x90 JFLVL8H12	35.0	0.8	-1.3
L6	815	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	0.7	-1.2	2 / 45x90 JFLVL8H12	35.0	3.3	-4.7
L7	515	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	2.0	-2.7	2 / 45x90 JFLVL8H12	35.0	0.7	-0.9
L8	515	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	1.4	-1.9	2 / 45x90 JFLVL8H12	35.0	1.2	-1.6
L9	815	2100 (L)	2 / 90x45 hyCHORD H12	-0.1	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4
L10	815	2100 (L)	2 / 90x45 hyCHORD H12	-0.1	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4	2 / 45x90 JFLVL8H12	35.0	1.4	-1.4
L11	515	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	1.5	-2.1	2 / 45x90 JFLVL8H12	35.0	1.1	-1.5
L12	515	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	0.5	-0.6	2 / 45x90 JFLVL8H12	35.0	2.2	-3.0
L13	815	2100 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	2.5	-3.3	2 / 45x90 JFLVL8H12	35.0	0.2	-0.2
L14	815	2100 (L)	2 / 90x45 hyCHORD H12	-0.1	2 / 45x90 JFLVL8H12	35.0	1.6	-2.2	2 / 45x90 JFLVL8H12	35.0	1.8	-2.4
L15	790	2015 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	0.0	No uplift	2 / 45x90 JFLVL8H12	35.0	0.0	No uplift
L16	1215	2015 (L)	1 / 140x90 GL8H12	0.0	2 / 45x90 JFLVL8H12	35.0	0.1	No uplift	2 / 45x90 JFLVL8H12	35.0	0.1	No uplift
L17	4815	2000 (L)	1 / 240x90 hyONE H12	-7.8	3 / 45x90 JFLVL8H12	35.0	9.1	-11.6	3 / 45x90 JFLVL8H12	35.0	9.2	-11.7
L18	515	2215 (L)	2 / 90x45 hyCHORD H12	0.0	2 / 45x90 JFLVL8H12	35.0	1.4	-1.9	2 / 45x90 JFLVL8H12	35.0	1.2	-1.7
L19	1725	2100 (L)	1 / 140x90 GL8H12	-0.6	2 / 45x90 JFLVL8H12	35.0	2.8	-2.3	2 / 45x90 JFLVL8H12	35.0	2.8	-2.3
L20	1215	2100 (L)	1 / 140x90 GL8H12	-0.1	2 / 45x90 JFLVL8H12	35.0	2.6	-3.4	2 / 45x90 JFLVL8H12	35.0	2.1	-2.8
L21	1615	2100 (L)	1 / 140x90 GL8H12	-0.4	2 / 45x90 JFLVL8H12	35.0	3.0	-4.1	2 / 45x90 JFLVL8H12	35.0	2.7	-3.6
L22	815	2215 (L)	2 / 90x45 hyCHORD H12	-0.2	2 / 45x90 JFLVL8H12	35.0	1.2	-1.6	2 / 45x90 JFLVL8H12	35.0	1.4	-1.9

Notes:
(1) R= Raised Lintel and L= Lowered Lintel.
(2) 'Defl.' relates to maximum permanent load deflection.
(3) 'Min. Bearing' is set to minimum 35mm. N/R indicates no bearing on studs with lintel acting as top plate stiffener.
(4) 'Down' relates to maximum downward reaction due to factored combined loads (e.g. 1.2G+1.5Q) and 'Uplift' refers to maximum uplift reaction due to 0.9G+Wup load combination.

Tumu Frame & Truss
Stortford Lodge, PO Box 2308, Hastings, , Ph (06) 879-7850, Fax (06) 879-6468

Date: 11-01-2019
Ver 4.4.0

Producer Statement - PS1 - Design

Job Ref: **3956C**

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

Tumu Frame & Truss

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

Tumu Frame & Truss
Stortford Lodge, PO Box 2308, Hastings, , Ph (06) 879-7850, Fax (06) 879-6468

Date: 11-01-2019
Ver 4.4.0

Fabricator / Designer Statement

Job Ref: **3956C**

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: *Homeworx*

SITE Details:

Address : *C & K Schmidli*
50 Silverton Rd, Poraiti

City: *Napier*
Post Code:

Nominal Design Criteria:

Design working life: 50 years
Building importance: Residential (Importance Level 2)
Roofing: Longrun (6.0 kg/sq.m)
Ceiling: 10mm Gib-board (6.8 kg/sq.m)
Top chord purlins: 900 mm

Design roof snow load: 0 Pa
(incl. probability factor
Ground snow load: 0 Pa
Location: Region N1 - lower Nth Island
Altitude above sea lev 100 m

BC restraints: Lateral tie restraints at 1800 mm crs
Standard truss spacing 900 mm
Standard roof pitch: 28.00 deg.
Ult. design wind speed 55 m/s (wind classification = Extra

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).

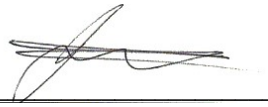
All truss designs and their connections have been designed using Pryda design software. Additional items such as roof/ceiling plane bracing, special notes, supplementary timber, etc., which may be shown on the plan drawings are the responsibility of others.

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: Jason Horne Position: Detailer

Signed:  Date: 11-01-2019

Fabricator / Designer Statement

Job Ref: **3956C**

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
BR2	Fixings and connections have not been designed.
BR1	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	13	-0	1/NPPC4	JD5	90	JD5	-1.94	2/12g-11x35 screws, 6/30x3.15d nails
	7	6000	1/NPPC4	JD5	90	JD5	-1.94	2/12g-11x35 screws, 6/30x3.15d nails
S10	10	4150	1/NPPC4	JD5	70	JD5	-1.69	2/12g-11x35 screws, 6/30x3.15d nails
	4	550	1/NPPC4	JD5	70	JD5	-1.76	2/12g-11x35 screws, 6/30x3.15d nails
	5	1150	1/NPPC4	JD5	70	JD5	-1.72	2/12g-11x35 screws, 6/30x3.15d nails
	6	1750	1/NPPC4	JD5	70	JD5	-1.48	2/12g-11x35 screws, 6/30x3.15d nails
	7	2350	1/NPPC4	JD5	70	JD5	-0.67	2/12g-11x35 screws, 6/30x3.15d nails
	8	2950	1/NPPC4	JD5	70	JD5	-1.49	2/12g-11x35 screws, 6/30x3.15d nails
	9	3550	1/NPPC4	JD5	70	JD5	-1.64	2/12g-11x35 screws, 6/30x3.15d nails
S11	1	-	1/NPPC4	JD5	90	JD5	-0.54	2/12g-11x35 screws, 6/30x3.15d nails
	10	4555	1/NPPC4	JD5	70	JD5	-2.46	2/12g-11x35 screws, 6/30x3.15d nails
	4	955	1/NPPC4	JD5	70	JD5	-2.35	2/12g-11x35 screws, 6/30x3.15d nails
	5	1555	1/NPPC4	JD5	70	JD5	-1.41	2/12g-11x35 screws, 6/30x3.15d nails
	6	2155	1/NPPC4	JD5	70	JD5	-1.50	2/12g-11x35 screws, 6/30x3.15d nails
	7	2755	1/NPPC4	JD5	70	JD5	-0.87	2/12g-11x35 screws, 6/30x3.15d nails
	8	3355	1/NPPC4	JD5	70	JD5	-1.50	2/12g-11x35 screws, 6/30x3.15d nails
	9	3955	1/NPPC4	JD5	70	JD5	-1.42	2/12g-11x35 screws, 6/30x3.15d nails
S2	13	-0	1/NPPC6	JD5	90	JD4	-4.00	3/12g-11x35 screws, 9/30x3.15d nails
	7	6000	1/NPPC6	JD5	90	JD4	-4.01	3/12g-11x35 screws, 9/30x3.15d nails
S3	3	800	1/NPPC4	JD5	90	JD5	-2.09	2/12g-11x35 screws, 6/30x3.15d nails
	6	3000	1/NPPC4	JD5	90	JD5	-1.39	2/12g-11x35 screws, 6/30x3.15d nails
S4	3	1175	1/NPPC4	JD5	70	JD5	-0.82	2/12g-11x35 screws, 6/30x3.15d nails
	4	2350	1/NPPC4	JD5	70	JD5	-0.54	2/12g-11x35 screws, 6/30x3.15d nails
	5	3525	1/NPPC4	JD5	70	JD5	-0.82	2/12g-11x35 screws, 6/30x3.15d nails
S5	7	4700	1/NPPC4	JD5	90	JD5	-3.16	2/12g-11x35 screws, 6/30x3.15d nails
S6	1	-	1/NPPC4	JD5	90	JD5	-3.16	2/12g-11x35 screws, 6/30x3.15d nails
	7	4700	1/NPPC4	JD5	90	JD5	-3.16	2/12g-11x35 screws, 6/30x3.15d nails
S7	1	-	1/NPPC6	JD5	90	JD5	-3.61	3/12g-11x35 screws, 9/30x3.15d nails
	7	5510	1/NPPC6	JD5	90	JD5	-3.61	3/12g-11x35 screws, 9/30x3.15d nails
S8	7	5510	1/NPPC6	JD5	90	JD5	-3.61	3/12g-11x35 screws, 9/30x3.15d nails
S9	1	-	1/NPPC4	JD5	90	JD5	-1.86	2/12g-11x35 screws, 6/30x3.15d nails
	7	5510	1/NPPC4	JD5	90	JD5	-1.83	2/12g-11x35 screws, 6/30x3.15d nails
SG1	1	-	2/NPPC6	JD5	90	JD5	-7.68	3/12g-11x35 screws, 9/30x3.15d nails
	5	3000	1/NPPC8	JD5	90	JD5	-7.25	4/12g-11x35 screws, 12/30x3.15d nails
SG2	1	-	2/NPPC6	JD5	90	JD5	-7.33	3/12g-11x35 screws, 9/30x3.15d nails
	5	3000	2/NPPC4	JD5	90	JD5	-5.79	2/12g-11x35 screws, 6/30x3.15d nails

Primary connections (truss to girder):

Truss Marks			Fixing Details	
Girder	Supported	Connector	Girder	Supported
SG1	S5	2/MG	8/30x3.15d nails	8/30x3.15d nails
SG2	S8	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

Fabricator / Designer Statement

Job Ref: **3956C**

All additional connections are as follows:

Supporting Truss	Supported Truss	Top Chord	Bottom Chord
S10	OR1	1/MGL	-
	OR3	1/MGL	-
	OR4	1/MGL	-
S11	OR5	1/MGL	-
	OR7	1/MGL	-

Fixing Summary:

Connector	Description	Total	Fixing Method (per connector)	
Primary			Girder	Supported Truss
MG	Multigrips	14	8/30x3.15d nails	8/30x3.15d nails
Secondary			Supporting Truss	Supported Truss
MGL	Multigrip (long)	16	6/30x3.15d nails	4/30x3.15d nails
Tiedown			Support	Truss
NPPC4	Purlin cleat	50	2/12g-11x35 screws	6/30x3.15d nails
NPPC6	Purlin cleat	37	3/12g-11x35 screws	9/30x3.15d nails
NPPC8	Purlin cleat	1	4/12g-11x35 screws	12/30x3.15d nails