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Rowan Lee

Proposed Dwelling, Lot 1, DP 10609, Rarangi Beach Road

- On-site Wastewater Management Report

26 July 2013

Our ref: 4053

Rowan Lee
New Dwelling
Lot 1, DP 10609,
Rarangi Beach Road

Contents

Issue No.	1	2	3	4	5	6
Date	26.07.13					
Prepared By	JH					
Approved By	RE					

1 Executive Summary

Smart Alliances have carried out an engineering appraisal of the on-site wastewater management criteria for the proposed new dwelling of Rowan Lee (the client) at Lot 1, DP 10609, Rarangi Beach Road, Blenheim.

The clients wish to construct a three bedroom dwelling which requires a wastewater design for 6 people. The total discharge on the site has therefore been placed at 990L/day.

There is sufficient area to treat and dispose of the wastewater created from the new dwelling.

The wastewater management system for the proposed dwelling should comprise a primary treatment (septic tank) unit fitted with a filter at the outlet. A pump chamber will distribute the treated wastewater to a discharge control sand trench for land application.

The application area should be two beds totalling a minimum of $28m^2$ in area.

Installation is to be in accordance with the requirements and recommendations of AS/NZS 1547:2012.

The recommendations listed above should not be taken in isolation and must be read in conjunction with the balance of this report and the context of the proposed residential development at the site.

2 Introduction

The client proposes to construct a new three bedroom dwelling on his property located at Lot 1, DP 10609, Rarangi Beach Road, Blenheim.

The purpose of this report is to present the results of site investigations carried out in relation to the on-site wastewater treatment and land application for the new dwelling. The site investigations were carried out on 02 July 2013.

3 Location & Site Description

The property is located on the corner of Rarangi Beach Road and Port Underwood Road.

The property borders one (1) privately owned property and the road reserve.

The property is relatively flat with a small plateau in the north west corner and is vegetated in grass.

The legal description of the property is Lot 1, DP 10609, and the land area is 0.0765 ha.

Locations of all the features of the property are shown on the site plan attached in Appendix A.

4 Wastewater Assessment

The site investigation has identified that the property is suitable for wastewater disposal by primary treatment (septic tank) fitted with a filter at the outlet. A pump chamber will distribute the treated wastewater to a discharge control sand trench for land application.

Three hand augured boreholes, numbered AG1 to AG3, were put down at the site in the proposed land application area. Their locations are shown on the site plan provided in Appendix A.

Based on the soil assessment carried out, an average drainage category of 1 has been adopted. With this considered, a maximum design loading rate of 35mm/day is considered appropriate. Logs of the representative soil properties are provided in Appendix B.

Groundwater was not encountered within the subsurface investigation and is anticipated to be at a depth greater than 1m below ground level. No natural watercourses are present within the property. A well (P28w/1579) exists approximately 60m east of the wastewater field.

No reticulated wastewater system is available on or near the property, however domestic wastewater can be collected, treated and disposed on the site.

The primary treatment system is expected to achieve the following treatment levels:

BOD after 5 days (average) < 150 g/m^3
Suspended solids (average) < 80 g/m^3

A wastewater design sheet is provided in Appendix B with the design calculation based on the following criteria for the proposed development:

- 3 bedrooms with permanent occupation by 6 people.
- Total design flow of 990 litres/day (6 persons and 165 litres/head/day).
- Soil category 1 and a design loading rate 35mm.
- Standard water reduction fixtures installed.

Standard water reduction fixtures are to be installed in accordance with Table H3 of AS/NZS 1547:2012 to assist in minimising water usage, such fixtures include:

Dual flush 11/5.5 litre water closets, shower-flow restrictors, aerator faucets (taps) and water conserving automatic washing machines.

Based on the criteria above, the minimum total area of the application field is $28m^2$.

We therefore recommend the application field be one 13m long and 2.2m wide bed. Details of the application bed are shown in Appendix A.

5 Environmental Assessment

An onsite wastewater system is required on this property as there is no reticulation in the area.

Because of the following reasons we do not envisage the wastewater becoming an environmental risk:

- Sand bed land application to provide a high level of treatment
- Short field size to insure even distribution
- Dose loaded via a pump
- No ground water in the vicinity of the wastewater field

The risk from the wastewater system contaminating drinking water is negligible. Set back distances are favourable, soil classification has been conservative and a large disposal area has been designed. The closest well (P28w/1579) is approximately 60m west of the land application area.

The filter installed at the outlet of the septic tank will improve the BOD_5 and SS and lessen the risk of soil clogging.

Being dosed via a pump will achieve good distribution and the 600mm of 2A sand will further treat the wastewater to a high standard.

The land application field is sited on elevated ground and not within any ground depressions that are prone to flooding.

The land application field is 12m from the nearest neighbours boundary. It is within 1m of the northern boundary which adjoins Port Underwood Road and where it poses no environmental risk.

The effect of a failed system will primarily affect the applicant's property. In the event of a failed system wastewater is likely to accumulate within the flat grassed area within which the field is located, adjoining the road reserve. Infiltration into the topsoil layers and the environmental buffering capacity of the land will ensure all water sources and neighbours are protected.

The effects will be easily identifiable, inhibit the applicant's use of the land and be generally unpleasant. The owner will want to address the failure and repair / install a new wastewater system. The property is large and a reserve area is available to relocate the field should the field fail.

Regular maintenance and inspection by the owner will ensure the onsite wastewater system is operating to a suitable standard.

6 Conclusion

There is sufficient area to treat and dispose of the wastewater created from the proposed four bedroom house.

The wastewater management system for the proposed dwelling should comprise a primary treatment (septic tank) unit fitted with a filter at the outlet. A pump chamber will distribute the treated wastewater to a discharge control sand trench for land application

The application area should be a minimum of $28m^2$ in area.

Installation is to be in accordance with the requirements and recommendations of AS/NZS 1547:2012.

7 Limitations

This report is valid for five years from the date of issue and covers the onsite wastewater treatment at Lot 1, DP 10609, Rarangi Beach Road for Rowan Lee. Any other areas are outside the scope of this report.

The reliance by other parties on the information or opinions in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

8 References

1. NZS 1547:2012 On-site Domestic Wastewater Management.
2. Begg, J.G. and Johnston, M.R. (compilers) 2000. New Zealand Geological Map10:Geology of the Wellington Area, 1:250,000
3. Liping Pang (ESR Christchurch). *Microbial removal rates in subsurface media estimated from published studies of field experiments and large intact soil cores.* J.of Environmental Quality. Vol 38. July-Aug 2009. pp 1531-1559.
4. Crites, R.W. and Tchobanoglous. Small and Decentralised Wastewater Management Systems. WCB/McGraw-Hill, 02/04/1998

SMART ALLIANCES LTD

Jeremy Harnett
Environmental Scientist
26 July 2013

Appendix A - Drawings

- Site Plan Drawing
- Typical Field Area Details

REV	DATE	DETAILS	REV	DATE	DETAILS

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CLIENT
ROWAN LEE

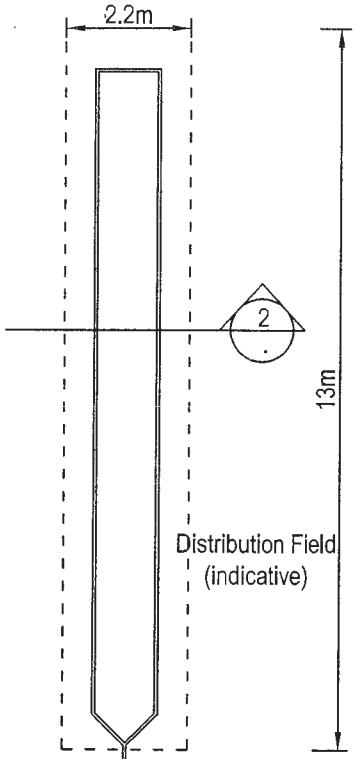
ISSUE
INFORMATION

PROJECT
LEE DWELLING
326 RARANGI BEACH ROAD

DRAWING
SITE PLAN

DATE 22-07-13	SCALE (A3) 1:250
DRAWN JH	REVISION 01
APPROVED	DWG NO. 4053-G10

CAD FILE REF: P:/4053-G10



SYSTEM USE & MAINTENANCE

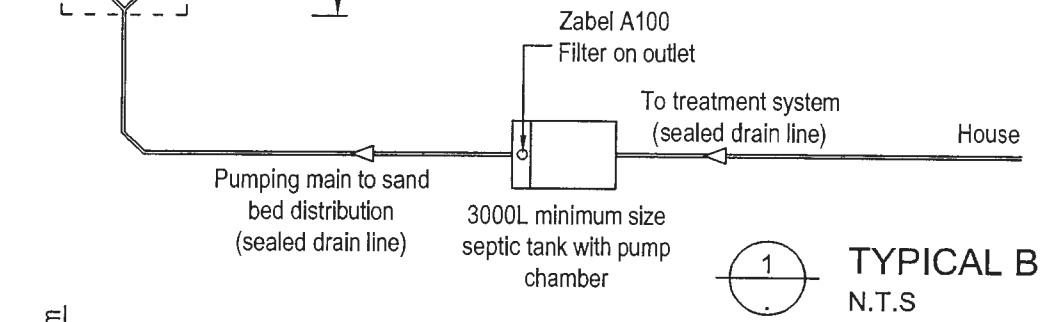
The household sewage should not contain anything other than human waste and toilet paper, and food material such as may go down a kitchen sink drain.

Garbage grinders are not recommended, although they need not be forbidden. More frequent de-sludging of the system may be needed if a garbage grinder is used.

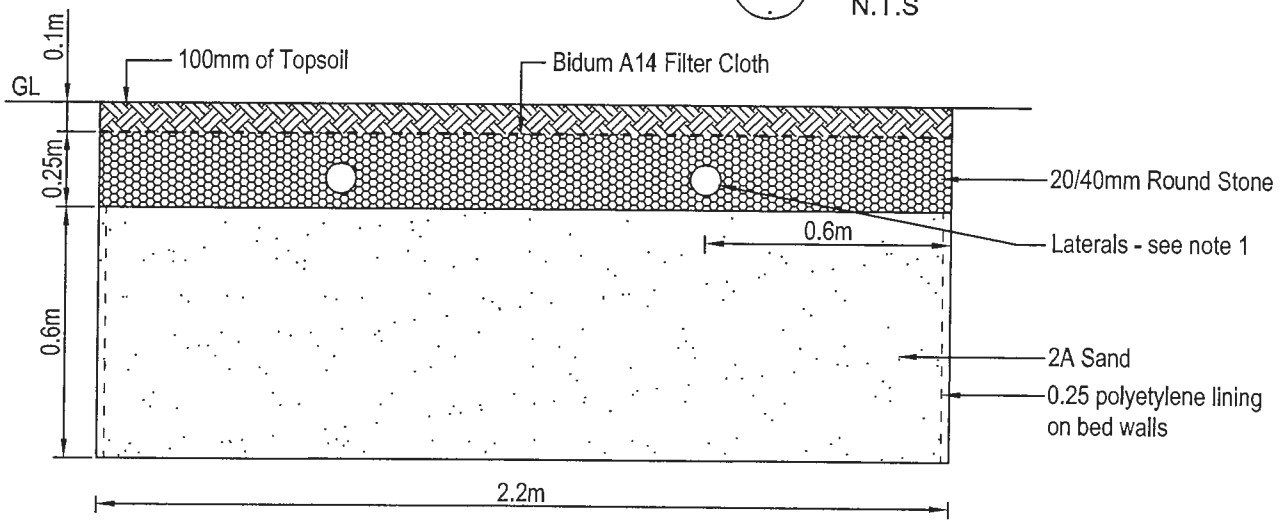
Normal use in the house of soaps, detergents, bleaches, plumbing fixture cleaners, drain cleaners and disinfectants will not harm the functioning of the system or the soil absorption system.

Prohibited discharge to the system:
* Oil/grease from a deep frier (for example).
* Stormwater or any drainage other than sewerage generated in the house.
* Petrol, oil or other flammable/explosive substances
* Garden, garage, and workshop chemicals (e.g. pesticides, paint cleaners,photographic chemicals, motor oil or trade waste.
* Disposable nappies & sanitary napkins.

It is an MDC requirement that any wastewater treatment system be regularly serviced and maintained by a contractor experienced in this field.



1 TYPICAL BED LAYOUT
N.T.S



Note:
1. Distribution drains to be U-PVC 100mmØ perforated pipe laid flat with perforations comprising at least 2% of surface area. (10mmØ slots at 100mm centres from 4 to 8 o'clock positions).

2 TYPICAL BED CONSTRUCTION
N.T.S

Do not scale from this drawing

REV	DATE	DETAILS
01	26-07-13	REPORT

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CLIENT
ROWAN LEE

PROJECT
LEE DWELLING
RARANGI BEACH ROAD

DRAWING
WASTEWATER DETAIL

ISSUE
REPORT

DATE 26-07-13
SCALE (A4) N.T.S
DRAWN JH
REVISION 01
APPROVED RE
DWG NO. 4053-G11

CAD FILE REF: P:/4053-G11

Appendix B – Wastewater Details, Calculations and Logs

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Wastewater Logs - 4053

Three hand augered boreholes, numbered AG 1 to AG 3, were put down at the site in the general vicinity of the proposed land application area and their locations are shown on the site plan in Appendix A. The representative soil properties are:

AG 1

Lower Depth (m)	Horizon or Layer Boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture Condition	
0.1	A	Alluvial	Brown-Grey	Pea Gravel	50%	Loose	Firm	Massive	Dry	1
0.9	B	Alluvial	Brown-Grey	Pea Gravel	70%	Loose	Firm	Massive	Slightly Moist	1

Site Classification: Sand – Very little to no coherence; cannot be moulded; single grains stick to fingers

AG 2

Lower Depth (m)	Horizon or Layer Boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture Condition	
0.1	A	Alluvial	Brown-Grey	Pea Gravel	50%	Loose	Firm	Massive	Dry	1
0.9	B	Alluvial	Brown-Grey	Pea Gravel	70%	Loose	Firm	Massive	Slightly Moist	1

Site Classification: Sand – Very little to no coherence; cannot be moulded; single grains stick to fingers

AG 3

Lower Depth (m)	Horizon or Layer Boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture Condition	
0.1	A	Alluvial	Brown-Grey	Pea Gravel	50%	Loose	Firm	Massive	Dry	1
0.9	B	Alluvial	Brown-Grey	Pea Gravel	70%	Loose	Firm	Massive	Slightly Moist	1

Site Classification: Sand – Very little to no coherence; cannot be moulded; single grains stick to fingers

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Project:	4053
Client:	Rowan Lee
Location:	326 Rarangi Beach Road
Date:	22.07.13

WASTEWATER SYSTEM DESIGN SHEET

To AS/NZS 1547:2012

Number of Proposed Bedrooms: 3

Intended water Supply: Community Scheme

Soil Category Determined on Site Category 1

Recommendation for this site: *Primary Treated Effluent in pump fed sand bed disposal*

DRAINAGE CONTROLS:
Need for surface water collector / cut-off drains? *No*

AVAILABILITY OR RESERVE / SETBACK AREAS
Reserve area available for extensions, % of design area: *100%*
Setback distance? (between development and disposal system):

DESIGN
Daily Loading Rate: *35.0* mm/day

Occupancy: 6 *Persons*

L/person/day: 165 L/p/d = 990 L/day from Table H3 AS/NZS 1547:2012

DESIGN DAILY FLOW: 990 L/day

SEPTIC TANK SIZE (MIN): 3000

AREA REQUIRED: 28 m²

LENGTH REQUIRED: 13 m with 2.2 metre wide beds

RESERVE AREA REQUIRED: 100% of specified

BED LENGTH: 13 m

NUMBER OF BEDS: 1

RECOMMENDED LAA = 1x 13m by 2.2m bed

Appendix C – Photographs

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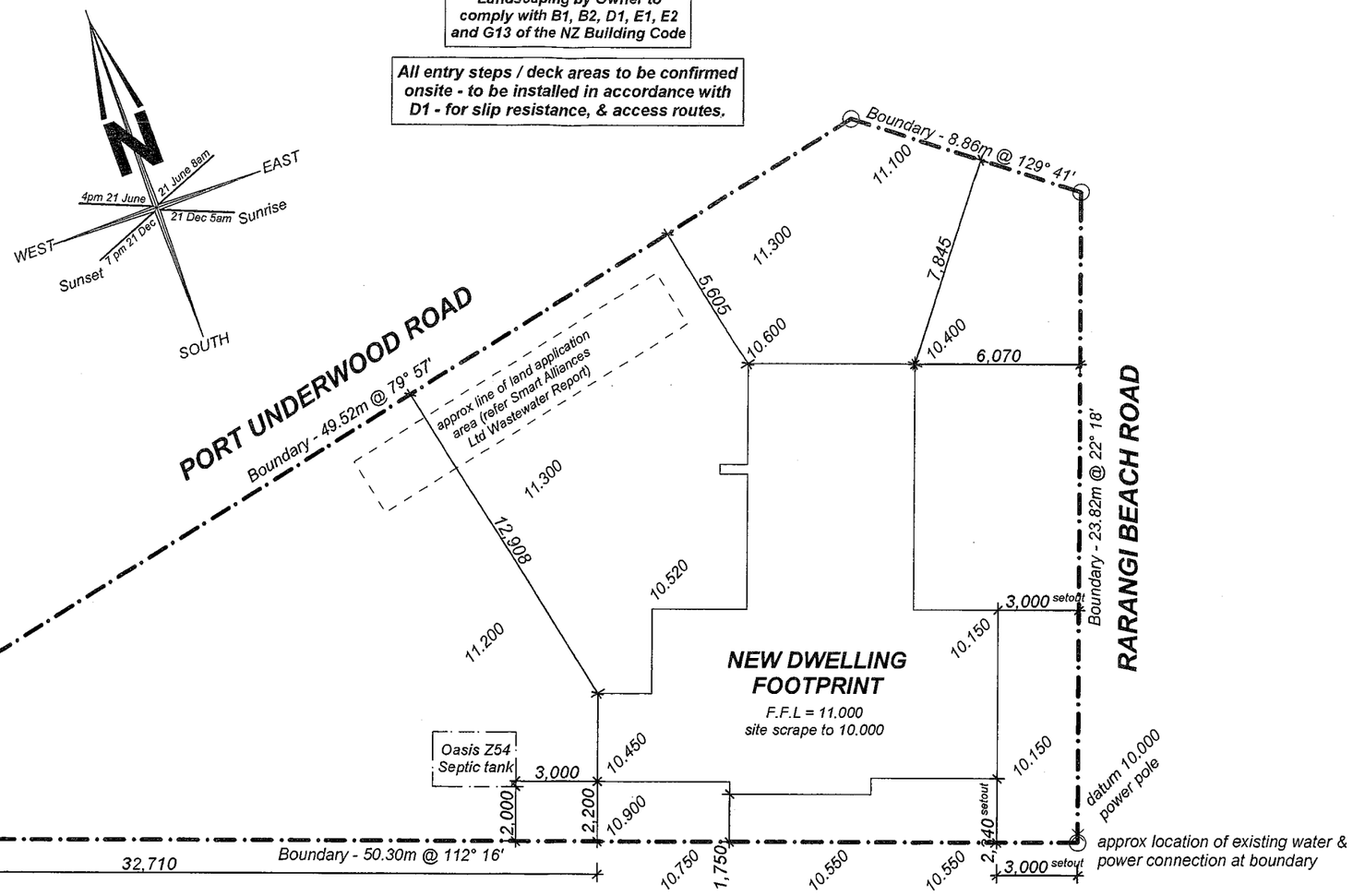
Looking north across the proposed land application area

Auger 1

Landscaping by Owner to comply with B1, B2, D1, E1, E2 and G13 of the NZ Building Code

All entry steps / deck areas to be confirmed onsite - to be installed in accordance with D1 - for slip resistance, & access routes.



326 Rarangi Beach Road
Lot 1 - Port Underwood Road
DP 10609

Site Area
=765m²

Ground Floor Area
= 142.81m²

Site Coverage
= 18.67%

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*Finished floor levels to comply with district councils minimum floor level requirements. Plans are **subject to change** once onsite levels can be verified.*

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NOTE

1. All work shall comply with NZS 3604:2011
2. All windows and doors to comply with NZS 4211:1985
3. Glazing to comply with NZS 4223:1993
4. Contractor must verify all dimensions on site prior to commencing any work
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Rev No.	Date	Amendment

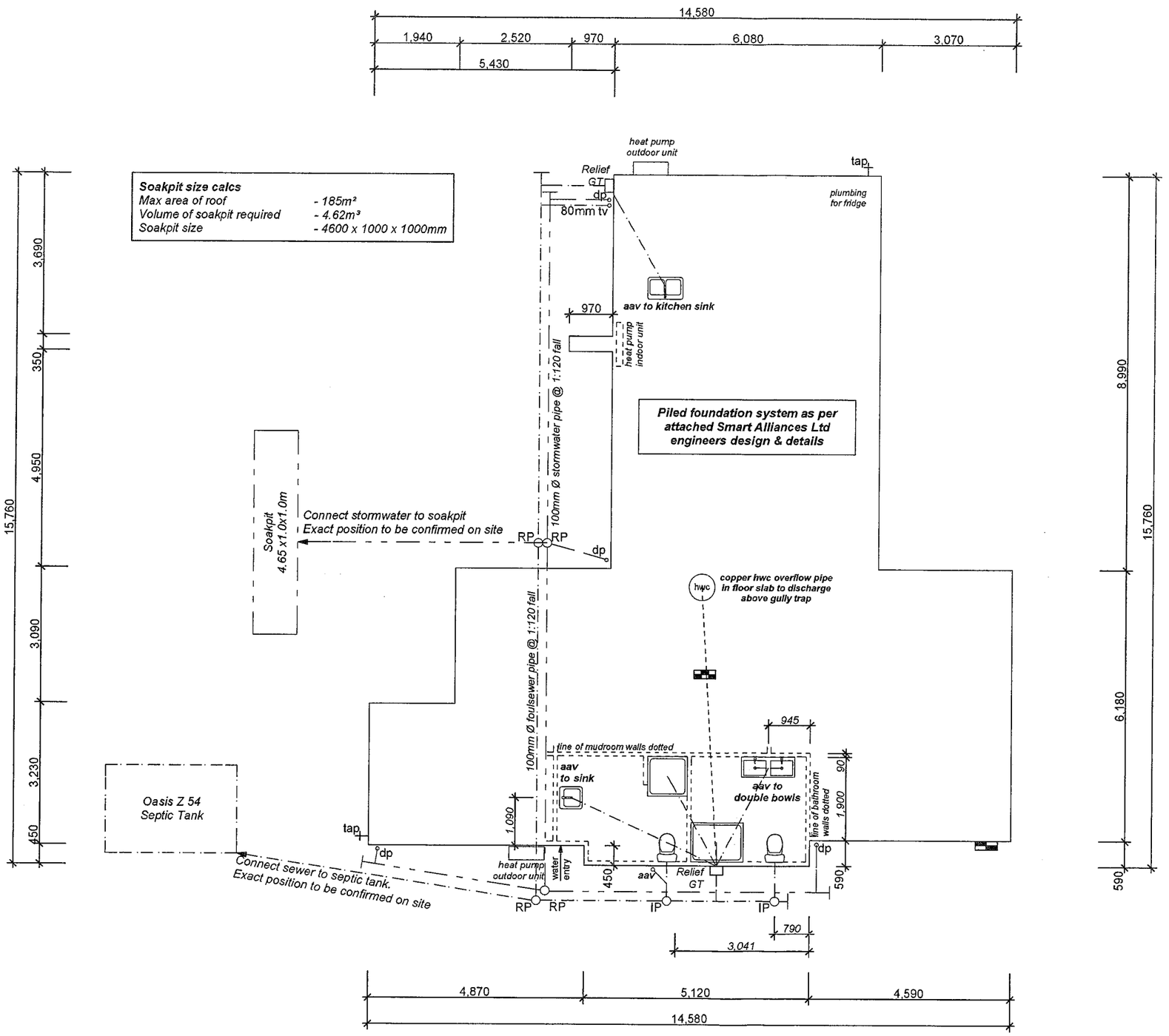
Consultant: R & D Lee
Drawn: C. Curtis
Date: 14/11/2013
Scale: 1:200

Job Name & Location: **Lee Beach House**
Lot 1, Rarangi Beach Road,

Sheet Title: Site Plan

Sheet No.: 01 of 10

Revision:



Soakpit size calcs

Max area of roof	*- 185m²*
Volume of soakpit required	*- 4.62m³*
Soakpit size	*- 4600 x 1000 x 1000mm*

LEGEND

Foulsewer Drain (100mm dia)	
Stormwater Drain (100mm dia)	
Downpipe	∘ dp
Terminal Vent (80mm)	∘ tv
Air Admittance Valve	∘ aav
Gully Trap	□ GT
Rodding Point	○ RP
Inspection Point	○ IP
Exterior Tap	┼ tap
Meter Board	
Switchboard	

Ground Floor Area *142.81m²*

All Plumbing and Drainage to comply with New Zealand Building Code and Other Approved Documents Sections G10, G12 and G13.

NOTE: All pipes under slab to be sleeved

NOTE: All fixtures more than 3.5m from gully traps shall be fitted with air admittance valves

40mm Ø waste pipe @ 1:40 fall to all bathroom and ensuite fittings except WC's
40mm Ø waste pipe @ 1:30 fall to laundry fittings
50mm Ø waste pipe @ 1:40 fall to kitchen fittings
WC's to have 100mm Ø waste @ 1:60 fall

HWC COMPLIANCE
Hot Water Cylinder shall comply with provisions of G12, H1 and NZS 4305: 1996 which is stated in H1 of the NZ Building Code.

G12 Water Supplies
Relief Valve Drain shall comply with Section 6.7.2 under G12/AS1
Vent Pipes shall comply with Section 6.8.2 under G12/AS1
Pipes to Tempering Valve also to be Copper.

H1 Energy Efficiency - NZS4305: 1996
Clause 3.2 Table 5
Length of Pipe to Kitchen Sink 10.0m with a 15mm pipe.
Other Clauses to comply with 3.5, 3.7 and 3.8

Tempering Valve to HWC Set at 55°C

Downpipe Size Calculation:
No of dp's = 2
Roof Plane Area Total = 72.2m²
Roof Pitch = 10°
Area of Roof per dp = 36.1m²

As per Table 5 of E1/AS1 Surface Water 63mm Ø dp's are required to service this roof

Downpipe Size Calculation:
No of dp's = 2
Roof Plane Area Total = 112.7m²
Roof Pitch = 14°
Area of Roof per dp = 56.4m²

As per Table 5 of E1/AS1 Surface Water 63mm Ø dp's are required to service this roof

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NOTE
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Rev No.	Date	Amendment

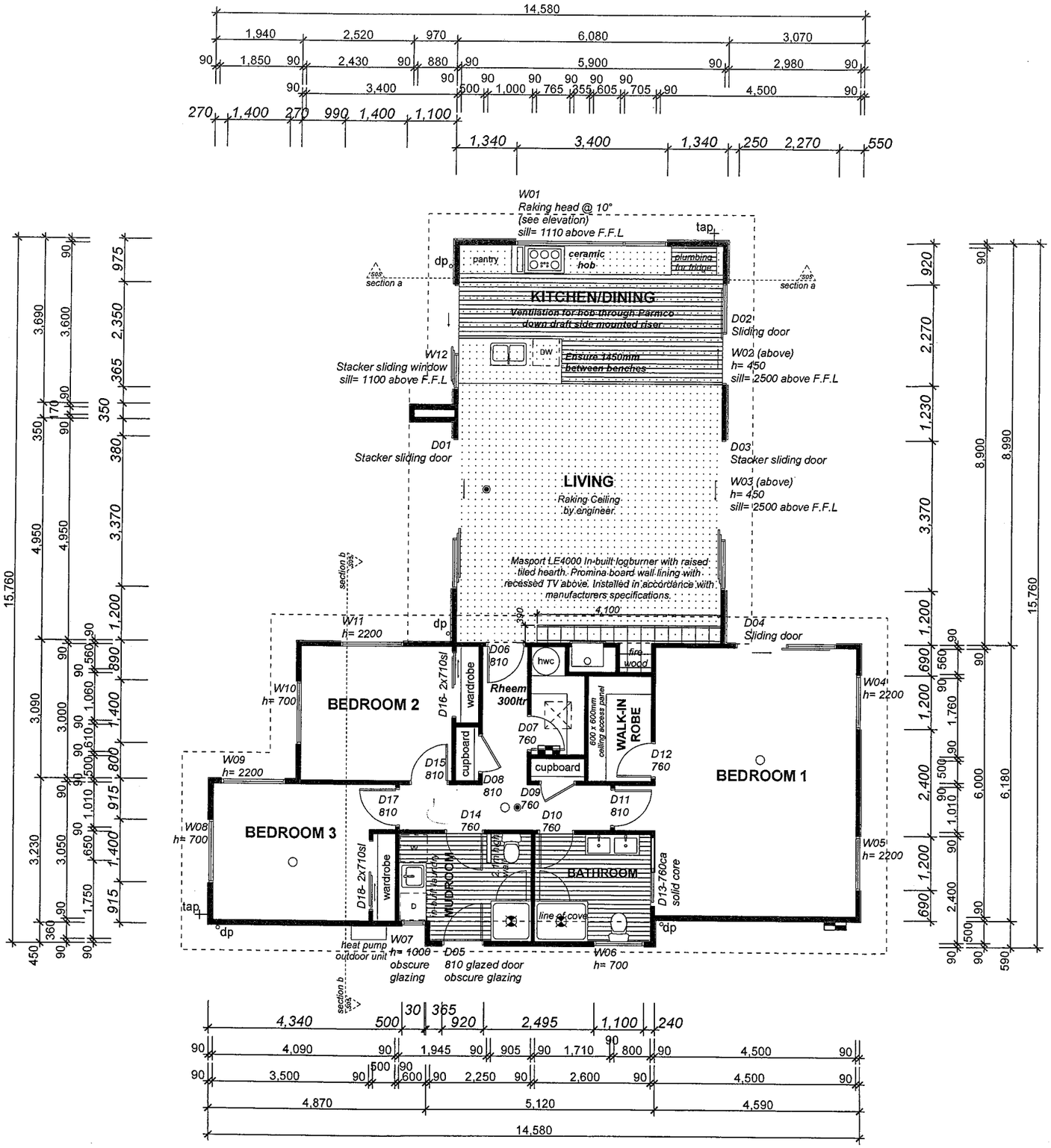
Consultant R & D Lee
Drawn C. Curtis
Date 14/11/2013
Scale 1:100

Job Name & Location
Lee Beach House
Lot 1, Rarangi Beach Road,

Sheet Title
Foundation & Drainage Plan

Sheet No.
02 of 10

Revision



FRAMING TREATMENTS in accordance with NZS 3602: 2003	
Exterior Framing	H1.2 treated SG 8 Radiata Pine
-Bottom Plate (90 x 45mm)	H1.2 treated SG 6 Radiata Pine
Interior Framing	H1.2 treated SG 6 Radiata Pine
Roof & Purlin Framing	H1.2 treated SG 8 Radiata Pine

Roofing	Colorsteel Longrun Corrugate
Roof Pitch	10° & 14°
Eaves	600mm from timber framing 740mm from timber framing South Bedroom 1 wall

EXTERIOR CLADDINGS
James Hardie Linea Weatherboards & James Hardie Axon Panels on cavity batten systems

Ground Floor Area 142.73m²

SHADED AREA INDICATES RAKING CEILING. ALL OTHER AREAS TO HAVE 2420mm HIGH LEVEL CEILING

◉ Smoke Detectors with hush button in accordance with F7 of the Building Code

Mechanical Ventilation - Securimax HYPER150High Performance In-Duct Axial Fan - 320m³/hr 89 litres per second - Ducted through to soffit

ALUMINIUM JOINERY HEAD HEIGHTS
all windows and doors to 2200 RO unless noted otherwise

DOUBLE GLAZING TO ALL WINDOWS AND DOORS

Grooved jambs to all internal doors
Refer to Homeview for opening sizes
Return studs required to all openings

INSULATION

Walls	R2.6 fibreglass insulation batts
Ceiling	R3.6 fibreglass insulation batts

All internal doors 1980mm high throughout

1200mm Gib Fyreline behind hob

WIND ZONE = HIGH

SEA SPRAY ZONE

All downlights to be CA 135-IC rated

Vinyl wet area flooring to have a CoF = 0.4

900x900mm Acrylic Shower Cubicle Mudroom
1200x900mm Acrylic Shower Cubicle Ensuite

Ducted heatpump to ceiling vents ○

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Telephone – 03 579 2368 Fax – 03 579 2481

Rev No.	Date	Amendment

NOTE
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3. Glazing to comply with NZS 4223:1985 & Pt 3 1993
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5.

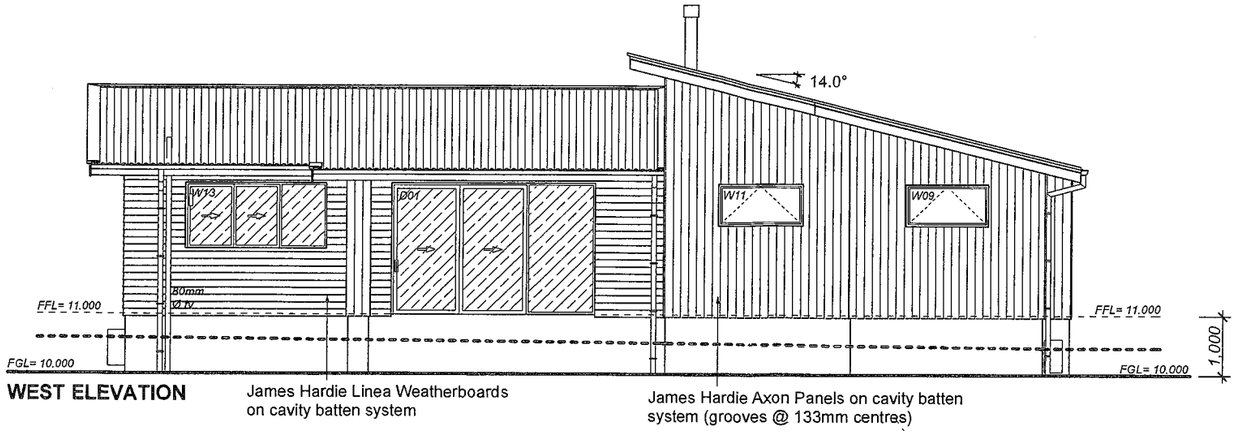
Job Name & Location

Lee Beach House
Lot 1, Rarangi Beach Road

Sheet Title

Floor Plan

Consultant	R & D Lee
Drawn	C. Curtis
Date	20/05/2013
Scale	1:100
Sheet No.	3 of 5
Revision	

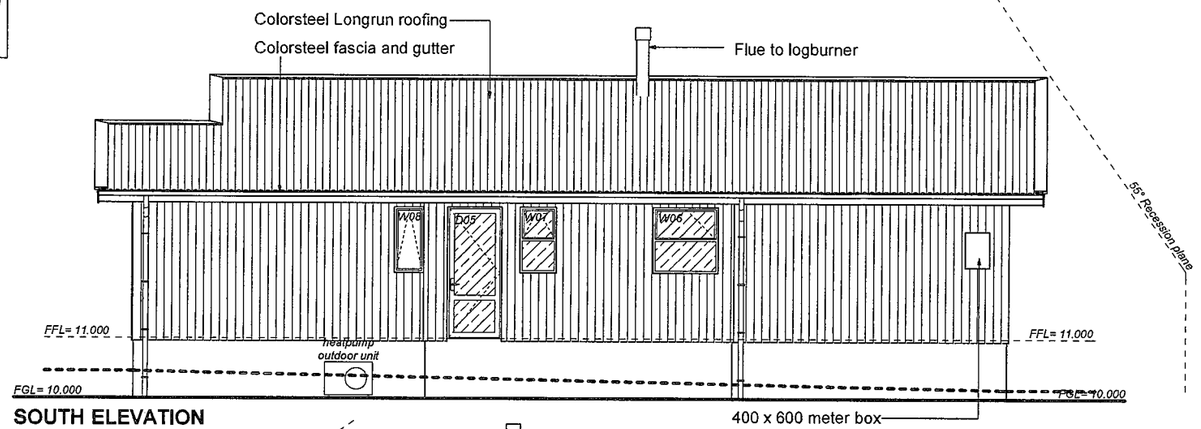


WEST ELEVATION

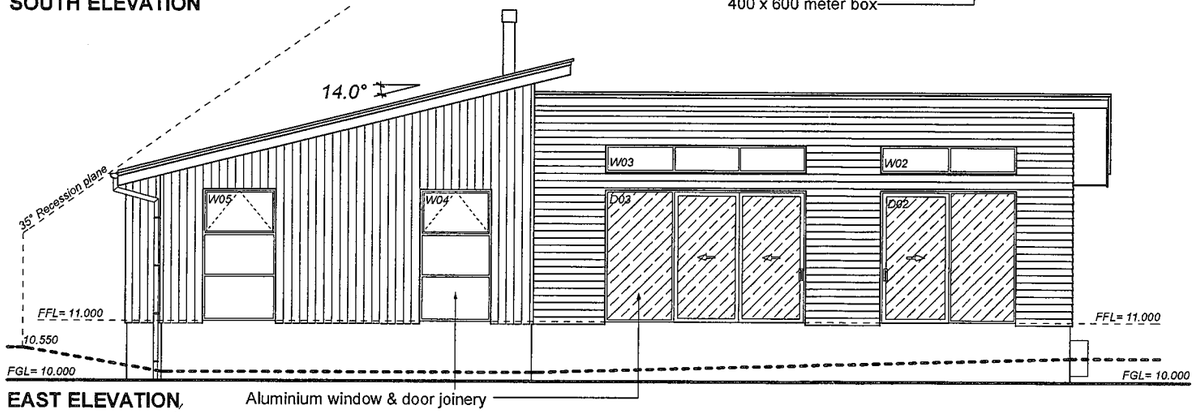
James Hardie Linea Weatherboards on cavity batten system

James Hardie Axon Panels on cavity batten system (grooves @ 133mm centres)

All entry steps / deck areas to be confirmed onsite - to be installed in accordance with D1 - for slip resistance, & access routes.

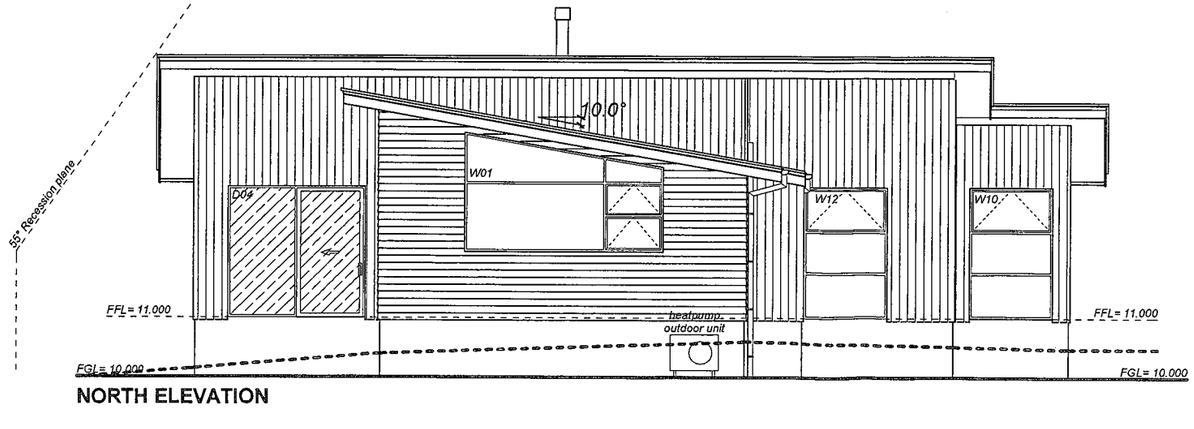


SOUTH ELEVATION



EAST ELEVATION

Aluminium window & door joinery



NORTH ELEVATION

CONTINUOUS WANZ SUPPORT BARS TO ALL EXTERNAL DOORS & WINDOWS EXCEPT GARAGE SECTIONAL DOOR

Safety Glazing as per NZS 4223

Existing Ground Level

Finished Ground Level

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Rev No.	Date	Amendment

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Job Name & Location

Lee Beach House
Lot 1, Rarangi Beach Road

Sheet Title

Elevations

Consultant	R & D Lee
Drawn	C. Curtis
Date	19/11/2013
Scale	1:100

Sheet No.

6 of 10

Revision