

ON-SITE WASTEWATER TREATMENT AND DISPOSAL DESIGN REPORT

**13 Church Bay Road
Oneroa, Waiheke Island**

STEVE BERNSTEIN AND KEITH FLAMANK
September 2022 | V1



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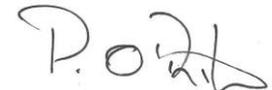
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Prepared by: 
Madya Dissanayaka, Graduate Engineer

Reviewed by: 
Emily Collings, Environmental Engineer

Approved by: 
Patrick O'Riordan, Director

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GWE Consulting Engineers

Ground Floor Oceanbridge House 25 Anzac Street Takapuna Auckland 0622
PO Box 32 311 Devonport Auckland 0624

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1 INTRODUCTION

This report was prepared by GWE Consulting Ltd (GWE) for our client Steve Bernstein and Keith Flamank in accordance with our letter of engagement dated 31 August 2022.

The client intends to make alterations and additions to the existing 3-bedroom dwelling at 13 Church Bay Road, Waiheke Island (the site). The client has proposed a new bedroom, so the dwelling will be assessed as a 4-bedroom dwelling for the purpose of onsite wastewater design.

This report provides an assessment of the onsite wastewater treatment requirements based on the proposed development and is in accordance with the Auckland Unitary Plan – Operative in Part (AUP-OP), Chapter E5 ‘On-site and Small-Scale Wastewater Treatment and Disposal’. The recommendations in this report have been based on guidance provided in the Auckland Regional Council (ARC) Technical Publication No. 58: On-site Wastewater Systems: Design and Management Manual (TP58), 2004.

2 PROPERTY/SITE DETAILS

The subject site is 13 Church Bay Road, Waiheke Island, and is legally described as Lot 9 DP 68070 with a total land area of 2,023 m². Figure 1 shows the site locality. The site is quadrilateral in shape with access provided via a concrete driveway off Church Bay Road to the south of the site.



Figure 1: Site Location Plan - 13 Church Bay Road, Waiheke Island

Source: <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

3 PROPOSAL

GWE has been provided with a set of drawings prepared by *Lighthouse Ltd*, dated 05/10/2022. Based on the drawings provided, we understand that the existing dwelling is to be altered to accommodate 4-bedrooms (refer to Appendix B).

For the purpose of on-site wastewater treatment and disposal, GWE has undertaken an occupancy assessment based on a 4-bedroom dwelling, which corresponds to a maximum occupancy of 6 people under TP58 Table 6.1.

The discharge is considered a **Permitted Activity** as it meets the requirements under E5.6.1 (General Standards) and E5.6.2.1 (Permitted Activity Standards).

4 SITE INVESTIGATION

4.1 Site Assessment

A site assessment was undertaken on 14 September 2022 by GWE Engineers. An examination of morphology, soil properties and site characteristics was included in the site assessment. The site inspection and site evaluation information was prepared in accordance with the TP58 Site Evaluation Investigation Checklist (refer to Appendix A).

The following land use characteristics were determined:

- The site is developed with an existing dwelling.
- The site is well vegetated with grassed lawn and a few mature trees.
- The property is currently serviced by a primary wastewater treatment system.
- The topography at the site is gentle to steeply sloping towards the south east (approx. 10-30 degrees).
 - The proposed wastewater disposal areas will be located on areas of less than 15-degree sloping.
- No sign of erosion or slope instability was observed on site.
- According to ARC GeoMaps, no overland flow paths (OLFP) traverse the site.
 - An OLFP is mapped along Church Bay Road, identified on site as a kerb and channel.
- Water supply is of roof water collected in water tanks
- The adjacent properties are expected to be serviced by a mixture of septic tanks and secondary/advanced secondary treatment systems.
- The Geological Map of New Zealand, (Institute of Geological and Nuclear Sciences Ltd., 2014) 1:250,000, indicates that the underlying soils is of the Waipapa Group chert (Waipapa terrane). The soils are described as '*lensoid chert, siliceous argillite and spilite, locally with manganese ore*'.

4.2 Subsoil Investigation

An assessment of underlying soils was undertaken by GWE during the site investigation. Soil profiles were assessed using auger-holes, with four hand augured boreholes (AH-01 to AH-04) advanced to a target depth of 1.2 m below ground level (bgl).

A summary, including relevant soil structure and textural features and horizon depths are outlined in Table 1. Approximate borehole locations are indicated on the Wastewater Site Plan (Drawing No. 500) appended as Appendix C. No percolation testing was undertaken.

Table 1: Soil Profile

HORIZON	DESCRIPTION	DRAINAGE	CATEGORY
AH1			
0.0-0.3 m	TOPSOIL, dark brown, moist, rootlets		
0.3-1.2 m	Silty CLAY, tan with grey and dark brown streaks, moist, plastic - At 0.8 m becomes more orange, stiff, dry to moist	Slow drainage	6
1.2 m	Target Depth. No Groundwater Encountered.		
AH2			
0.0-0.3 m	TOPSOIL, dark brown, wet		
0.3-1.2 m	Silty CLAY, tan with grey and brown streaks, stiff, plastic, dry to moist	Slow drainage	6
1.2 m	Target Depth. No groundwater encountered.		
AH3			
0.0-0.3 m	TOPSOIL, dark brown, wet		
0.3-1.2 m	Silty CLAY, tan with grey mottles, dry to moist, stiff, plastic	Slow drainage	6
1.2 m	Target Depth. No groundwater encountered.		
AH4			
0.0-0.3 m	TOPSOIL, dark brown, wet, rootlets		
0.3-1.2 m	Silty CLAY, tan with grey and orange mottles, dry to moist, stiff, plastic	Slow drainage	6
1.2 m	Target Depth. No groundwater encountered.		

The subsoil assessment is summarised as follows:

- The soils at the site are predominantly comprised of silty clay.
- ARC TP58 guidelines indicate that the soils are Category 6 with slow drainage properties.
- Loading rates for the wastewater disposal should be conservatively based upon Category 6 soils. Suitable for 2-3 mm/day loading rate as per TP58.

- Shallow streaking/mottling was observed in several boreholes across the site. This is expected to be caused by poor infiltration (Category 6 soils), rather than by a seasonally elevated groundwater table.
- No groundwater was encountered at a maximum exploratory depth of 1.2m.

5 DESIGN FLOW

Water supply is sourced from roof water collected in water tanks. A flow allowance of 145 L/person/day has been adopted in accordance with TP58 Table 6.2, source D (Households with 6/3 Flush Toilet(s) And Standard Water Reduction Fixtures). The peak wastewater volume generated from a 4-bedroom dwelling with 6 people occupancy is anticipated to be 870 Litres/day. Table 2 provides a summary of the design flows from the dwelling.

Table 2: Design Flow

DEVELOPMENT	4-bedroom dwelling
OCCUPANCY (TABLE 6.1, TP58)	6 people (max.)
FLOW ALLOWANCE	145 litres/person/day
DESIGN FLOWS	870 litres/day
WATER FIXTURES (TABLE 6.2, TP58)	Household with 6/3 flush toilet(s) and standard water reduction fixtures ¹
OTHER NOTES	No greywater reuse recycling proposed

Notes:

1. *Standard Water Saving Fixtures include dual flush 6/3litre toilet cisterns, and includes aerator faucets, shower flow restrictors, water conserving automatic washing machines and restricted, standard automatic washing machine and dishwasher, no garbage grinder. Further, a water meter is recommended and is a requirement in the Auckland Region for any systems with design flows based on allowances less than this level.*

GWE should be notified immediately if there are any changes to the number of bedrooms or floor layouts, as this could lead to an increase in the design wastewater volumes and impact on the size of the treatment system.

6 WASTEWATER TREATMENT

The existing septic tank is to be decommissioned and replaced with a *Econotreat Wastewater Treatment Plant*. The proposed system provides secondary level treatment. The *Econotreat* system meets Grade A certification from the Onsite Effluent Treatment National Testing Programme (OSET NTP). Table 3 provides an overview of the system specifications. Refer to Appendix D for the full system specifications.

Table 3: Specification for Proposed Treatment System

WASTEWATER TREATMENT SYSTEM	ECONO TREAT VBB C-2000
SYSTEM COMPONENTS	<p>Tank 1 – Dual chamber septic tank 3,200 L</p> <p>Tank 2 – Aeration tank 3,200 L</p> <p>Pump chamber ~318 L</p>
ALARM SYSTEM	Visual and audible alarm located at plant
LOCATION	Refer to Drawing No. 500
DISCHARGE QUALITY	<p>BOD₅ ≤ 20 mg/L</p> <p>TSS ≤ 30 mg/L</p>

The treatment plant should be located a minimum of 3.0 m from the habitable dwelling and 1.5 m from site boundaries.

GWE should be consulted if an alternative brand of wastewater treatment plant is installed on site.

7 LAND DISPOSAL

Treated effluent is proposed to be dispersed to land via pressure compensating dripper irrigation (PCDI). PCDI is a common and recommended method of treated wastewater dispersal. The PCDI system offers even distribution over undulating contours with evapotranspiration assistance to minimise the risk of runoff.

It is proposed that the primary disposal area be located on the grassed lawn south-east of the site. The land application is proposed to be sub-surface laid at 0.5 m centres and the length of dripline increased accordingly e.g. 580 lineal meters. Refer to Appendix E for the list of high evapotranspiration plants considered suitable for wastewater disposal areas, lawn grass is considered appropriate.

The disposal area is proposed to be setback a minimum of 3.0 m from the proposed dwelling and 1.5 m from all site boundaries, in line with TP58 Table 5.2.

A greater than 15 m separation from the OLFP can be achieved.

96 m² (33%) has been allocated for reserve area. An overview of the disposal system is provided in Table 4.

Table 4: Proposed Land Disposal System

TYPE	PCDI system (subsurface laid at 0.5 m line centres)
SOIL CATEGORY	6
LOADING RATE	3 mm/day
LOADING DEVICE/METHOD	Pump
PRIMARY DISPOSAL AREA	290 m ²
RESERVE DISPOSAL AREA	96 m ² (33%)

GROSS LOT AREA TO DISCHARGE RATIO	2.3 L/m ² /day
SEPARATION DISTANCES (COMPLIANCE ASSESSED AS PER RECOMMENDED MINIMUM SEPARATION DISTANCES IN TP58 TABLE 5.2)	Buildings/Houses: 3 m (achieves TP58 setback) Property Boundary: 1.5 m (achieves TP58 setback) Surface watercourse: > 15 m (achieves TP58 setback) Groundwater: >0.6 m (achieves TP58 setback)

Refer to Appendix C for the Wastewater Site Plan (Drawing No. 500).

8 ASSESSMENT OF ENVIRONMENTAL EFFECTS

8.1 Impact on Surface Water

TP58 identifies the following required separation distances for surface water for Category 4–6 soils:

- 15 m provided there is secondary level treatment.

More than 15 m setback is achieved from the OLFP, meeting the requirements under TP58.

Furthermore, the PCDI driplines will be sub-surface laid and treated wastewater dispersed at a low loading rate of 3 mm/day, enhanced by evapotranspiration. As such, the effects on surface water are considered to be less than minor.

8.2 Impact on Groundwater

The groundwater table was not encountered at the depth of 1.2 m during subsoil investigations (early spring). Table 5.2 in TP58 gives a recommended separation of 0.9 m to groundwater for secondary treated wastewater in Category 4-6 soils. As the minimum separation of 0.9 m from groundwater is exceeded, the effects on groundwater are assessed as being less than minor.

8.3 Impact on Soil

As the site soils are categorised as Category 6 with slow draining characteristics, PCDI has been specified to ensure an even loading of treated effluent over the whole disposal area. Discharging secondary treated effluent to land via PCDI will have a less than minor impact on the long-term acceptance rates of the soils at the site.

Any nitrate/nitrogen from the treatment plant will be denitrified by the carbon in the soil layers and micro-organisms. Evapotranspiration vegetation at the disposal area will also promote the uptake of nitrogen and phosphorus and mitigate the accumulation of these compounds in the topsoil zone.

8.4 Impact on Amenity Values

Given the high level of treatment provided by the proposed treatment system, odours are not anticipated at the plant nor the disposal field. The volume of treated effluent produced is proposed to be dispersed over a large disposal area. The treatment plant and disposal areas will be located a minimum of 3.0 m from habitable buildings and a minimum of 1.5 m from lot boundaries. The treatment plant is not expected to result in any discernible adverse noise effects to the owners or neighbours.

Constituents remaining in the treated effluent such as nitrogen and phosphorus are taken up by vegetation and transpired to the air. The regular doses of effluent within the disposal area will promote vegetation growth.

8.5 Summary

The system has been designed in accordance with relevant guidelines, and is consistent with the Resource Management Act (RMA) and the AUP-OP. Furthermore, there are several specific design features that will mitigate against environmental effects, including:

- Secondary level treatment.
- Separation distances in accordance with TP58 Table 5.2 are maintained.
- Low loading rate (3 mm/day).
- Evapotranspiration planting proposed.
- 33% reserve area is available, in accordance with TP58.

For the reasons outlined above, and throughout the application, insignificant adverse environmental effects are anticipated. Groundwater, surface water, public health, and amenity are all adequately protected. Overall, the proposal to discharge domestic wastewater from the proposed dwelling via a land disposal system, is considered to have less than minor adverse effects that can be contained within the boundaries of the site. Ongoing maintenance and management of the proposed treatment system in accordance with the supplier's specifications will be required to ensure that no minor adverse effects arise.

9 STATUTORY ASSESSMENT

In accordance with Table E5.4 of the AUP-OP, the proposal to discharge wastewater from the proposed development via a land disposal system is a **Permitted Activity** under E5.4.1 (A1) as the discharge meets the permitted activity standards identified under rule E5.6.2.1.

Tables 5 and 6 outline the general and permitted activity conditions as per the Rules E5.6.1 and E5.6.2.1 and how they are being complied with in the proposal.

Table 5: General Standards for Activities (Rule E5.6.1)

PERMITTED ACTIVITY CRITERIA (RULE E5.6.1)	PROPOSED ACTIVITY
1. The wastewater discharge must not result in contamination of ground water at a point of extraction, any surface water, a stormwater drain, a neighbouring property, or cause a public health risk.	Complies – Wastewater discharge meets recommended minimum separation distances in accordance with TP58.
2. The construction of the on-site wastewater treatment system and the resulting discharge of treated wastewater must not disturb or otherwise adversely affect any place scheduled in the Historic Heritage Overlay or any site or place in the Sites and Places of Significance to Man Whenua Overlay.	Complies – No such sites recorded nearby.
3. The wastewater treatment system must be maintained by a suitably qualified on-site wastewater service provider in accordance with Technical Publication 58 On-site Wastewater Systems: Design and Management Manual 2004 (TP58) recommendations, the manufacturer's recommendations or the suitably qualified on-site wastewater service provider's recommendations. At a minimum, the maintenance, where relevant to the specific system, must ensure that:	
a. septic tank outlet filters are checked and serviced regularly at intervals as recommended by the manufacturer.	Complies – Service and maintenance agreement between client and service contractor to be completed post-installation.
b. the secondary/ tertiary treatment plant and the land application disposal system is serviced six monthly by a suitably qualified on-site wastewater service provider.	Complies – Service and maintenance agreement between client and service contractor to be completed post-installation.
c. primary/septic tank(s) and the land application disposal system are inspected no less frequently than every three years and where necessary the tank(s) are pumped out by a suitably qualified on-site wastewater service provider when sludge and scum levels occupy 50 per cent of the tank volume.	Complies – To be part of the service and maintenance agreement between client and service contractor completed post-installation.
d. records of each maintenance action must be retained and made available on the site for inspection by the Council or their agents.	Complies – As part of service and maintenance agreement.
4. Reserve disposal areas must be retained in a suitable state and condition that does not prevent their use for future effluent disposal.	Complies – Reserve area shall be maintained with no proposed development in the area.
5. There must be no activities, including heavy vehicle or stock access, over the wastewater disposal area that may adversely affect the disposal area.	Complies – Aforementioned activities are not proposed on wastewater disposal areas.

Table 6: Permitted Activity Standards (Rule E5.6.2.1)

PERMITTED ACTIVITY CRITERIA (RULE E5.6.2.1)	PROPOSED ACTIVITY
1. The wastewater design flow and actual flow must not be greater than 2 m ³ per day.	Complies – Design Flow 0.87 m ³ /day
2. The ratio of site area to wastewater discharge volume must be equal to or greater than 1.5 m ² per litre per day.	Complies – A:V ratio: 2,023/870= 2.3 m ² /L/day
3. The site must not be contained or described in a title issued under the Unit Titles Act 2010 or a cross lease form of title.	Complies – Title not under the Unit Titles Act 2010 or cross lease form of title
4. The site investigation procedures, design, installation and operation of the on-site wastewater treatment and land application disposal system must be undertaken in accordance with Technical Publication 58 On-site Wastewater Systems: Design and Management Manual 2004 (TP58), and must in particular give effect to all of the following:	Complies – Site Assessment undertaken in accordance with TP58 Site Evaluation Checklist - refer to Appendix A.
a. the site assessment practices determining the system suitability (Chapter 5 of Technical Publication 58 Onsite Wastewater Systems: Design and Management Manual 2004 (TP58). The flow allowances used to establish system design flow must be at least 120 litres/person/day for dwellings and the maximum estimated water use for all other activities as specified in Chapter 6 of Technical Publication 58 On-site Wastewater Systems: Design and Management Manual 2004 (TP58).	Complies – Design flow allowance of 145 L/person/day based on roof water supply Source D fixtures (Households with 6/3 Flush Toilet(s) And Standard Water Reduction Fixtures). No grey water reuse proposed.
b. a minimum of secondary treatment that is in accordance with the design criteria and parameter ranges provided in Chapter 7 of Technical Publication 58 On-site Wastewater Systems: Design and Management Manual 2004 (TP58).	Complies – Econotreat (secondary treatment) is proposed to service the property.
c. the land disposal system must comprise pressure compensating dripper irrigation with an area loading rate dependant on soil category, but no greater than 5 mm/day.	Complies – PCDI designed in accordance with TP58 with a 3 mm/day loading rate based on category 6 soils.
d. the provision and maintenance of a minimum reserve land disposal area (Chapter 5 of Technical Publication 58 On-site Wastewater Systems: Design and Management Manual 2004 (TP58).	Complies – 33% reserve area available. Maintenance to be completed on installation.

10 CONCLUSIONS AND RECOMMENDATIONS

The proposed wastewater treatment and disposal design is based on a 4-bedroom dwelling with six-person occupancy, equalling 870 L/day (flow allowance of 145 litres/person/day). The proposed wastewater treatment plan for the dwelling is an *Econotreat Wastewater Treatment Plant*. The system provides a secondary level of treatment. Based on a loading rate of 3mm/day (TP58 category 6 soils) a primary disposal of 290 m² is proposed with a reserve area of 96 m² (33%).

11 LIMITATIONS

This report has been prepared for the sole benefit of **Steve Bernstein and Keith Flamank** as our client, and their appointed representatives, according to their instructions, for the specific objectives described herein. It is not to be relied upon or used out of context by any other party for any other objective without reference to GWE Consulting Ltd. The reliance by other parties on the information or opinions contained in the report shall, without prior review and agreement in writing, be at such parties' sole risk.

APPENDIX A
TP58 SITE EVALUATION CHECKLIST

ONSITE WASTEWATER DISPOSAL SITE EVALUATION CHECKLIST

PART A: CONTACT DETAILS

1. Applicant Details:

APPLICANT NAME	Steve Bernstein & Keith Flamank	
COMPANY NAME		
PROPERTY OWNER NAME(S)	FIRST NAME	SURNAME
	Steve	Bernstein
	Keith	Flamank
NATURE OF APPLICANT*	Owner	

*i.e. Owner, Lessee, Prospective Purchaser, Developer

2. Consultant/Site Evaluator Details:

CONSULTANT/AGENT NAME	GWE Consulting Limited	
SITE EVALUATOR NAME	Madya Dissanayaka	
POSTAL ADDRESS	PO Box 32 311	
	Devonport	
	Auckland 0624	
PHONE NUMBER	BUSINESS	09 445 8338
	MOBILE	021 143 1675
NAME OF CONTACT PERSON		
EMAIL ADDRESS		

3. Are there any previous existing discharge consents relating to this proposal or other waste discharge disposal on the site.

YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	(please tick)
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If yes, give Reference Number(s) and description:

4. List any other consents in relation to this proposal site and indicate whether or not they have been applied for or granted. If so, specify Application Details and Consent No. (e.g. Land Use, Water Take, Subdivision, Earthworks, Stormwater Consents).

Building consent to be applied for

PART B: PROPERTY DETAILS

1. Property for which this application relates:

PHYSICAL ADDRESS OF PROPERTY	13 Church Bay Road, Waiheke Island
TERRITORIAL LOCAL AUTHORITY	Waiheke
REGIONAL COUNCIL	Auckland
LEGAL STATUS OF ACTIVITY	Permitted: <input checked="" type="checkbox"/> Controlled: <input type="checkbox"/> Restricted Discretionary: <input type="checkbox"/>
RELEVANT REGIONAL RULE(S) [NOTE 1]	Rules E5.4 (Activity Table E5.4.1), E5.6.1 and E5.6.2.1 (General Standards for Activities, Auckland Unitary Plan Operative in part (AUP OP))
TOTAL PROPERTY AREA (m ²)	2,023
MAP GRID REFERENCE OF PROPERTY [NOTE 2]	

Notes:

- In the Auckland Region, the relevant Permitted Activity criteria is as specified in the ARC Air Land and Water Plan (ARC ALWP) Rule 5.5.xx (refer Appendix CTP58) and until this Plan comes into force the PA criteria is specified in the ARC Transitional Regional Plan for "Onsite Disposal of Domestic Wastewater".
- NZMS 260 series, scale 1:50,000.

2. Legal description of land (as shown on Certificate of Title):

LOT NO.	9	DP NO.	68070	CT NO.	NA23C/436
OTHER (SPECIFY)					

Please ensure copy of Certificate of Title is attached.

PART C: SITE ASSESSMENT – SURFACE EVALUATION

(Refer TP58 – Sn 5.1 General Purpose of Site Evaluation and Sn 5.2.2(a) Site Surface Evaluation) Note: Underlined terms defined in Table 1, attached.

1. Has a Desk Study been undertaken for this property?

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
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If yes, please specify the findings of the Desk Study, and if not, please specify why this was not considered necessary:

2. Has a Slope Stability Assessment been carried out on the property?

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
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If no, why not?

Not required

AUTHOR	
COMPANY/AGENCY	
DATE OF REPORT	
BRIEF DESCRIPTION OF REPORT FINDINGS	

3. Site Characteristics (see Table 1 attached):

PERFORMANCE OF ADJACENT SYSTEMS:
Mix of primary and secondary
ESTIMATED RAINFALL AND SEASONAL VARIATION:
1250/750mm
VEGETATION COVER:
Refer to the GWE Wastewater Report
SLOPE SHAPE:
Refer to the GWE Wastewater Report
SLOPE ANGLE:
Refer to the GWE Wastewater Report
SURFACE WATER DRAINAGE CHARACTERISTICS
Refer to the GWE Wastewater Report
FLOODING POTENTIAL: YES / NO
No
<i>If yes, specify relevant flood levels on appended site plan, i.e. one in 5 year and/or 20 year and/or 100 year return period flood level, relative to disposal area.</i>
SURFACE WATER SEPARATION:
Refer to the GWE Wastewater Report
SITE CLEARANCES (PROVIDE GENERAL DESCRIPTION HERE AND SPECIFY DIMENSIONS IN PART 6 BELOW AND IN SITE PLAN):
SITE CHARACTERISTICS:
Refer to GWE Wastewater Design Report

4. Site Geology of the subject property:

Waipapa Group chert (Waipapa terrane)	
GEOLOGICAL MAP REFERENCE NUMBER:	GNS New Zealand Geological Web Map 1:250,000 Geology map,

5. What Aspect(s) does the proposed disposal system face (please tick)?

NORTH		SOUTH	
NORTH-WEST	✓	SOUTH-WEST	

NORTH-EAST	
EAST	

SOUTH-EAST	
WEST	

6. Site Clearances, which should also be shown on the site plan:

SEPARATION DISTANCE FROM	TREATMENT SEPARATION DISTANCE (m)	DISPOSAL FIELD SEPARATION DISTANCE (m)
Boundaries	1.5	≥ 1.5
Surface Water		>10
Groundwater		>1.2
Stands of Trees/Shrubs		Within vegetated area
Wells, Water Bores	N/A	
Embankments/Retaining Walls	>1.5	>3
Buildings	>3	>3
Other (specify)	N/A	N/A

PART D: SITE ASSESSMENT – SUBSOIL INVESTIGATION

(Refer TP58 – Sn 5.1 General Purpose of Site Evaluation, Sn 5.2.2(b) Site Surface Evaluation and Sn 5.3 Subsurface Investigations) Note: Underlined terms defined in Table 2, attached.

1. Please identify the soil profile determination method:

TEST PIT		(depth ___ m)	NO. OF TEST PITS	
BOREHOLE	✓	(depth =1.2m)	NO. OF BORE HOLES	4
OTHER (SPECIFY)				

Soil Report attached?

YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	(please tick)
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2. Was fill material intercepted during the subsoil investigation?

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
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If yes, please specify the effect of the fill on wastewater disposal:

3. Has percolation testing been carried out?

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
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If yes, please specify the method:

Test Report attached?

YES NO N/A (please tick)

4. Are surface water interception/diversion drains required?

YES NO (please tick)

If yes, please show on the site plan.

5. Please state the depth of the seasonal water table:

WINTER	>1.2 m			
SUMMER	>1.2 m			
PLEASE INDICATE WHETHER MEASURED	<input type="checkbox"/>	OR ESTIMATED	<input checked="" type="checkbox"/>	(please tick)

6. Are there any potential short circuit paths?

YES NO (please tick)

If yes, please explain how these have been addressed:

7. Based on results of subsoil investigation above, please indicate the disposal field soil category:

Please refer TP58 Table 5.1

IS TOPSOIL PRESENT?	Yes	IF SO, TOPSOIL DEPTH	0.30m
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SOIL CATEGORY	DESCRIPTION	DRAINAGE	TICK ONE
1	Gravel, coarse sand	Rapid draining	
2	Course to medium sand	Free draining	
3	Medium-fine and loamy sand	Good drainage	
4	Sand loam, loam and silt loam	Moderate drainage	
5	Sandy clay loam, clay loam and silty clay loam	Moderate to slow draining	
6	Sandy clay, non-swelling clay and silty clay	Slow draining	<input checked="" type="checkbox"/>
7	Swelling clay, grey clay, hardpan	Poorly or non-draining	

Reason for placing in stated category:

PART E: DISCHARGE DETAILS

1. Water supply source for the property (please tick):

RAINWATER (ROOF COLLECTION)	<input checked="" type="checkbox"/>
BORE/WELL	<input type="checkbox"/>
PUBLIC SUPPLY	<input type="checkbox"/>

2. Calculate the maximum daily volume of wastewater to be discharged, unless accurate water meter readings are available (refer TP58, Table 6.1 and 6.2):

NUMBER OF BEDROOMS	4-bedroom dwelling	
DESIGN OCCUPANCY	6	(number of people)
PER CAPITA WASTEWATER PRODUCTION	145	(litres per person per day)
OTHER (SPECIFY)		
TOTAL DAILY WASTEWATER PRODUCTION	870	(litres per day)

3. Do you propose to install?

A. FULL WATER CONSERVATION DEVICE?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
B. WATER RECYCLING – WHAT %	%	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)

If you have answered yes, please provide additional information including the estimated reduction in water usage:

4. Is Daily Wastewater Discharge Volume more than 2,000 litres:

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	(please tick)
-----	--------------------------	----	-------------------------------------	---------------

Note: if the answer the above is Yes, an ARC Wastewater Discharge Permit will be required.

5. Gross Lot Area to Discharge Ratio:

GROSS LOT AREA	2,023	(m ²)
TOTAL DAILY WASTEWATER PRODUCTION	870	(litres per day) (from above)
LOT AREA TO DISCHARGE RATIO	2.3	

6. Does this proposal comply with the Auckland Regional Council Gross Lot Area to Discharge Ratio of greater than 1.5?

YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	(please tick)
-----	-------------------------------------	----	--------------------------	---------------

7. Does this proposal comply with the Auckland Regional Council Lot Area to Discharge Ratio of greater than 3?

YES
 NO (please tick)

8. Is an Auckland Regional Council Discharge Consent required?

YES
 NO (please tick)

PART F: PRIMARY TREATMENT (REFER TP58, 7.2)

1. Please indicate below the no. and capacity (litres) of all septic tanks including type (single/dual chamber grease traps) to be installed or currently existing.

NUMBER OF TANKS	TYPE OF TANK	CAPACITY OF TANK (LITRES)
Refer to GWE Wastewater Report		

2. Is a Septic Tank Outlet Filter to be installed?

YES
 NO (please tick)

If yes, please state the type:

To be confirmed

PART G: SECONDARY AND TERTIARY TREATMENT

(Refer TP58 Section 7.3, 7.4, 7.5 and 7.6)

1. Please indicate the type of additional treatment, if any, proposed to be installed in the system (please tick):

SECONDARY TREATMENT	
Home Aeration System	<input checked="" type="checkbox"/> EconoTreat
Commercial Aeration Plant	<input type="checkbox"/>
Intermediate Sand Filter	<input type="checkbox"/>
Recirculating Sand Filter	<input type="checkbox"/>
Recirculating Textile Filter	<input type="checkbox"/>
Clarification Tank	<input type="checkbox"/>
TERTIARY TREATMENT	<input type="checkbox"/>

Ultraviolet Disinfection	
Chlorination	
OTHER (SPECIFY)	

PART H: LAND DISPOSAL METHOD

Refer TP58 Section 8

1. Please indicate the proposed loading method (please tick):

GRAVITY	
DOSING SIPHON	
PUMP	✓

2. Is a high water level alarm being installed in pump chambers?

YES	✓	NO		(please tick)
-----	---	----	--	---------------

3. If a pump is being used, please provide the following information:

TOTAL DESIGN HEAD	To be confirmed by supplier	(m)
PUMP CHAMBER VOLUME	Included within system	(litres)
EMERGENCY STORAGE VOLUME	more than 24 hours	(litres)

4. Please identify the type(s) of land disposal methods proposed for this site (please tick):

Refer TP58 Section 9 and 10

SURFACE DRIPPER IRRIGATION	
SUB-SURFACE DRIPPER IRRIGATION	✓
STANDARD TRENCH	
DEEP TRENCH	
MOUND	
EVAPO-TRANSPIRATION BEDS	
OTHER (PLEASE SPECIFY)	

5. Please identify the loading rate you propose for the option selected in Part H, Section 4 above stating the reasons for selecting this loading rate:

LOADING RATE	3	(litres/m ² /day)
DISPOSAL AREA	BASAL	(m ²)
	AREAL	290 (m ²)

Explanation (refer TP58 Section 9 and 10)

Refer to GWE Wastewater Report

6. What is the available reserve wastewater disposal area (refer TP58 Table 5.3):

RESERVE DISPOSAL AREA (m ²)	96
PERCENTAGE OF PRIMARY DISPOSAL AREA %	33%

7. Please provide a detailed description of the design and dimensions of the disposal field and attach a detailed plan of the field relative to the property site?

Description and Dimensions of Disposal Field

Please refer Drawing 500

Plan attached?

YES NO (please tick)

If not, explain why not:

PART I: MAINTENANCE AND MANAGEMENT

Refer to TP58 Section 12.2)

1. Has a maintenance agreement been made with the treatment and disposal system suppliers?

YES NO To be provided post installation (please tick)

PART J: ASSESSMENT AND ENVIRONMENTAL EFFECTS

1. Is an Assessment of Environmental Effects (AEE) included with the application?

(Refer TP58 Section 5. Ensure all issues concerning potential effects are addressed)

YES NO (please tick)

2. Are there any specific environmental constraints?

YES NO (please tick)

If yes, please explain:

PART K: IS YOUR APPLICATION COMPLETE?

1. In order to provide a complete application, you have remembered to:

FULLY COMPLETE THIS ASSESSMENT FORM	✓
INCLUDE A <i>LOCATION PLAN AND SITE PLAN</i> (WITH SCALE BAR)	✓
INCLUDE A PROPERTY TITLE (CERTIFICATE OF TITLE)	
ATTACH AN ASSESSMENT OF ENVIRONMENTAL EFFECTS (AEE)	✓

2. Declaration

I hereby certify that, to the best of my knowledge and belief the information given in this application is true and complete.

NAME		SIGNATURE	
POSITION		DATE	

TABLE 1 – DEFINITION OF TERMS OF SITE ASSESSMENT**SURFACE EVALUATION**

TERM	DEFINITION
Desk Study	Review of existing site/area specific information held on council files.
Slope Stability	Identify any areas of previous or existing slope instability, these areas require specific geotechnical investigation to assess the potential impact of land application of wastewater and may be unsuitable for wastewater irrigation.
Performance of other Systems	No on-site systems should be proposed in any locality without full knowledge of the performance of adjacent systems, and the reason for any failures occurring, be it soil type, loading rates or poor construction or changes in the type of development and increased per capita water consumption. If there are any doubts about the proposed land application system performance the best available wastewater treatment and land application technology should be used.
Rainfall	Precipitation intensities and duration will influence the choice and siting of disposal systems relative to subsoil saturation effects.
Vegetation Cover	Natural vegetation, trees, bush can be retained and incorporated into both land disposal and buffer areas or garden and lawn areas can be sub-irrigated.
Slope Shape	Identify slope shape and location of depressions/zones of potential surface water ponding. Depressions in which water could pond should be avoided.
Slope Angle	Past slope limits have been set to accommodate machine digging of conventional trenches; Slopes that are much steeper than 15% can be utilised in good soils by employing either narrow and shallow trenching machines, by hand digging or pinning dripper irrigation lines to the ground surface (see Chapters 9 & 10, TP58)
Surface Water Drainage	Identify surface water flow paths onto and off the site including concentrated or broad flow and areas of potential surface water ponding.
Flooding Potential	Where there is a risk of flooding, the 1% and 20% flood levels need to be determined.
Surface Water Separation	Identify any surface water such as permanent and ephemeral streams, lakes, ponds and wetlands and specify separation distances from system/site.
Site Clearances	Identify separation distances from proposed and existing buildings, site boundaries, paved areas and topographical discontinuities eg: embankments either supported or unsupported, water bores, pages areas. Table 5.1 (TP58) specifies recommended minimum separation distances for determining suitable clearances based on the wastewater treatment quality.
Site Characteristics	Note characteristics of surface soil such as soil cracking, evidence for annual soil saturation, seepages, rock exposures etc.
Geology	Review of geological maps for preliminary soils/constraints assessments.
Water Supply Source	On-site supply via rainwater roof collection or groundwater bore or reticulated public supply.
Slope Aspect	Note direction the slope faces for maximising evapotranspiration potential through exposure to sun and wind.
Gross Lot Area	Lot area to discharge volume for initial determination of Auckland Regional Council discharge consent requirements.
Net Lot Area	Area available for primary and reserve land disposal areas including land area taken up by right of ways, impermeable areas, setback requirements from surface water etc.

SUBSURFACE EVALUATION

TERM	DEFINITION
Borehole/Test Pit	All site assessments are to include a detailed assessment of soils underlying the proposed land disposal area. The assessment shall be by test pit or where this is impractical by hand auger borehole. The subsurface assessment is likely to be to a depth of at least 1.0 to 2.0 metres depth or the minimum recommended groundwater separation distance between the base of the land disposal system and any groundwater table (see Table 5.2). A detailed description of soils encountered, depth to groundwater and relevant soil structure and soil texture features shall be recorded and the depth to each horizon and soil description within the soil profile submitted with the site assessment report.
In Situ Soil	Determine if the soils are natural and determine soil suitability for land disposal of wastewater.
Fill Material	Fill may be unsuitable or poorly suited for land disposal of wastewater, depending on the composition and level of compaction in which case the proposed land disposal area should be relocated, the fill removed, or the land disposal system specifically designed to accommodate the soil constraints. In the case of filled sloping sites, the designer should take into account the potential for short-circuiting along the fill / natural ground interface.
Soils	Determine soil type, clay, silt, sand, gravel and provide a detailed description of the soil structure and texture. The USEPA On-site Wastewater Treatment Systems Manual 2002 Section 2.2.5, 5.5.7 and ANZS 1547:2000 Section 4.1D provides soil description procedures.
Soil Category	The soils description above allows determination of the soil category.
Short Circuiting Paths	Assess potential for wastewater to short circuit through clay or highly permeable soil into surface or ground water. The soil type, permeability and level of wastewater renovation required within the soil also influence the clearance distance required from the groundwater table prone to summer desiccation in which development of shrinkage cracks can provide short circuiting paths directly to groundwater or surface water. If necessary, the "clearance" can be artificially increased by using a "mounding" land-application system and / or the level of wastewater treatment can be increased to include at least secondary treatment prior to distribution to the system. A mound may be constructed from clean topsoil to provide clearance between the base of the disposal system and the seasonally highest level of groundwater.

APPENDIX B
PROPOSED FLOOR PLANS



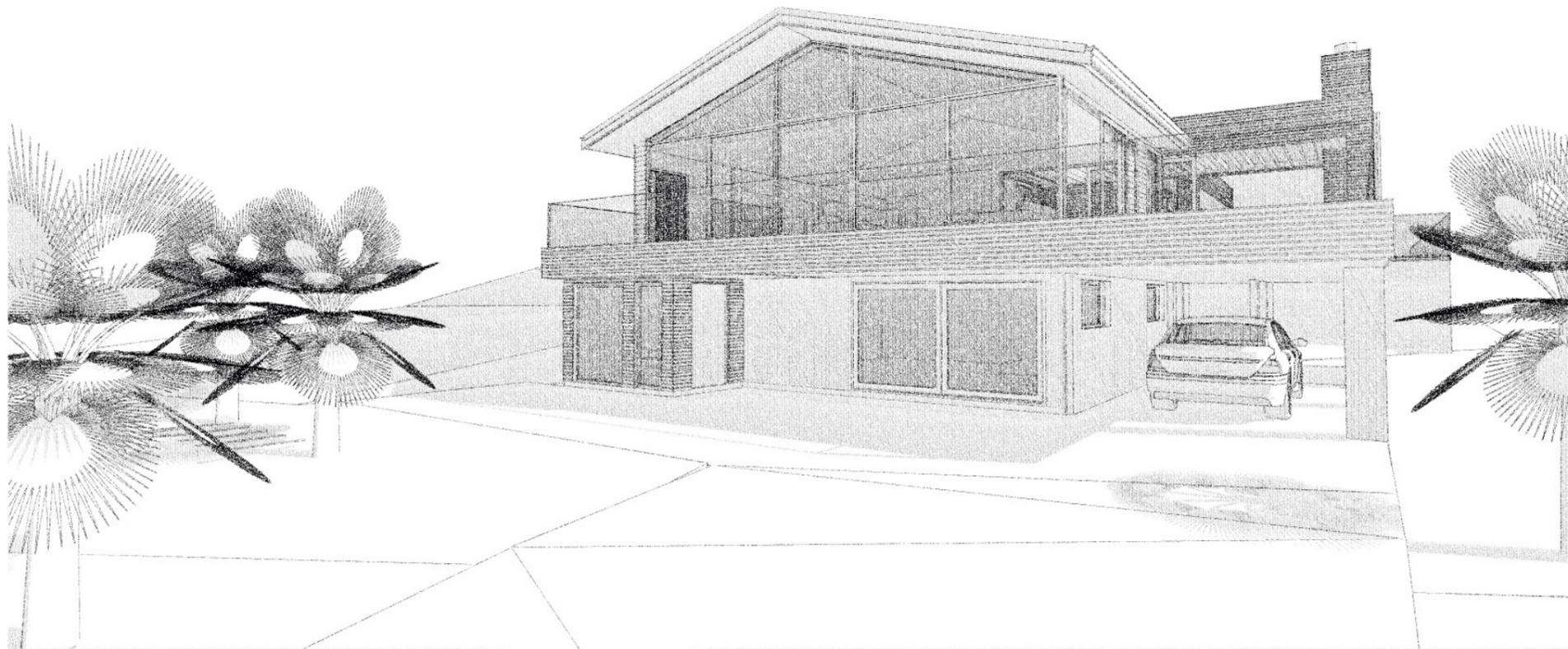
ARCHITECTURAL DRAWINGS

SCHEME PLANS

DRAWING LIST

REV

Layout ID	Layout Name
01	Cover Sheet
02	Site Plan
03	Existing Ground Floor Plan
04	Existing First Floor Plan
05	Existing Elevations
06	Existing Elevations
07	Ground Floor Plan
08	First Floor Plan
09	Elevations
10	Elevations
11	Renders

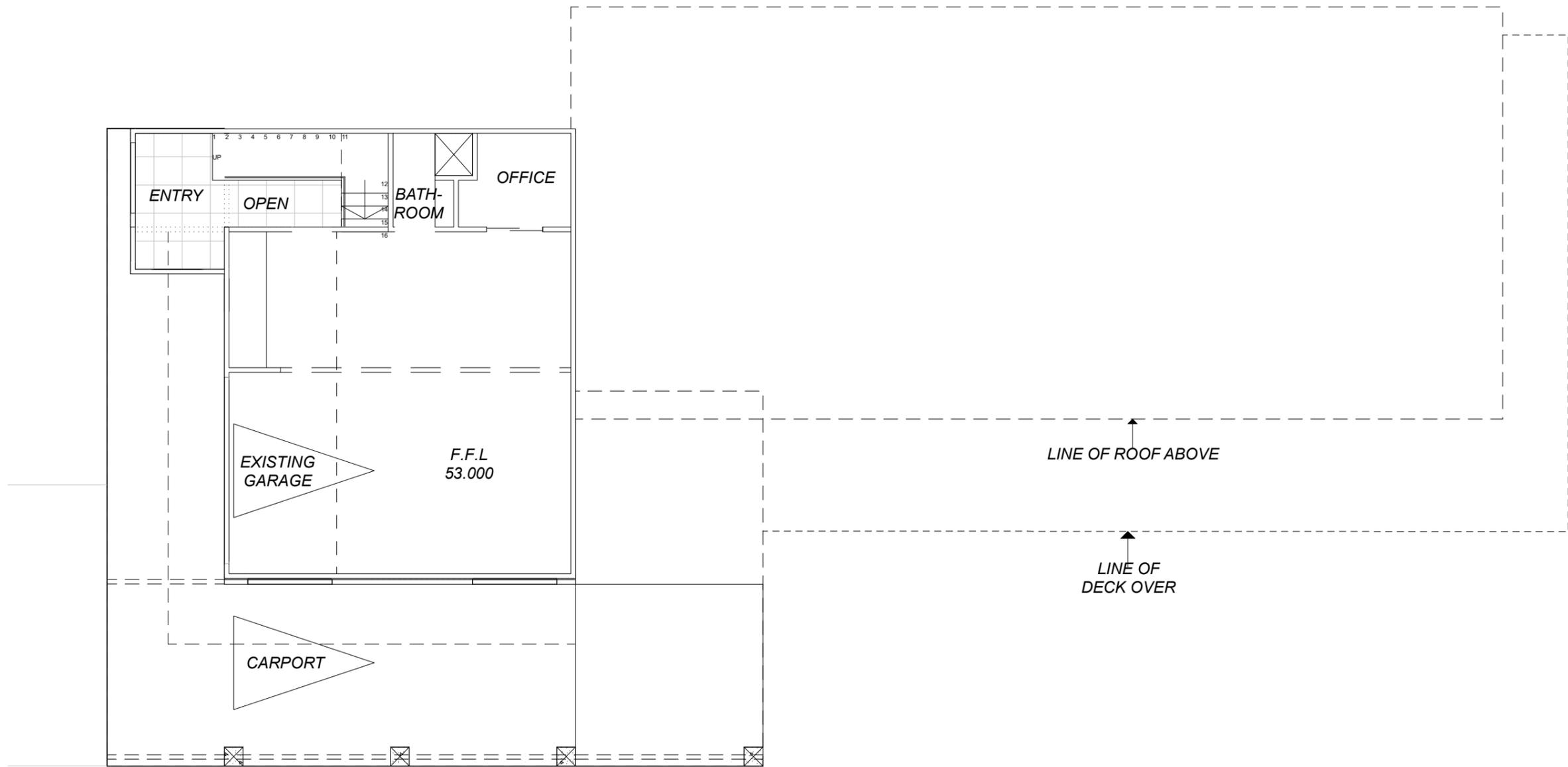


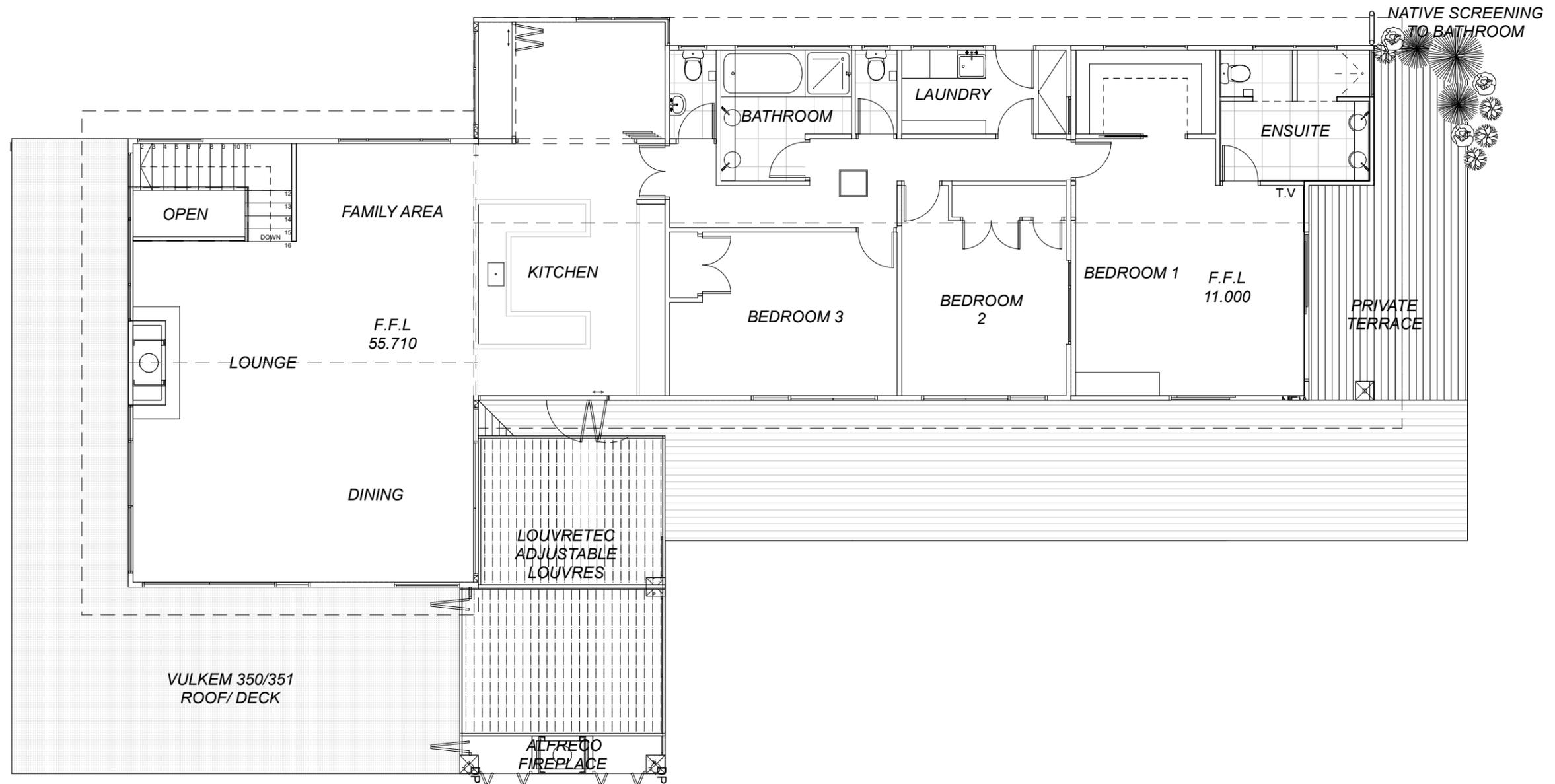
BERNSTEIN AND FLAMANK HOME ALTERATIONS

13 Church Bay Road, Church Bay, Waiheke Island

LITEHOUSE LTD

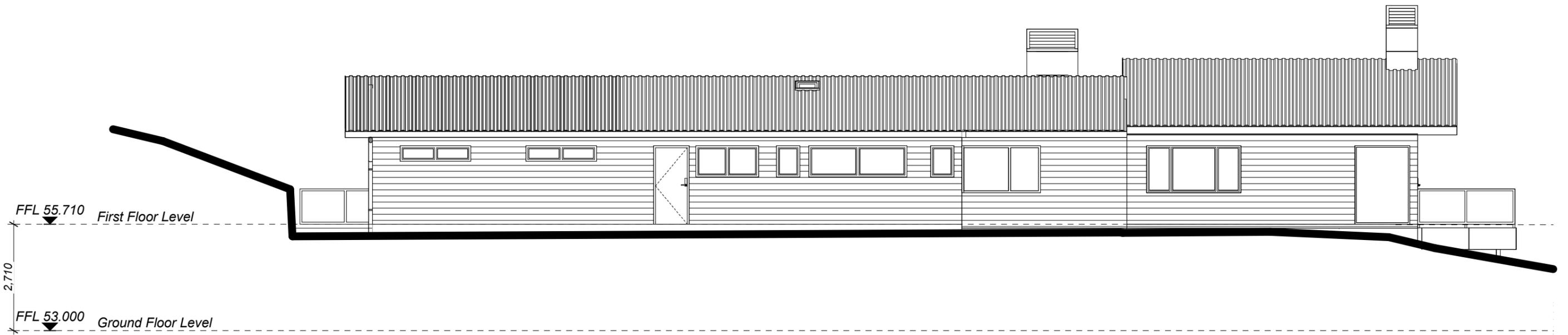
P: (09) 372 547 E: bryce@lighthouse.nz



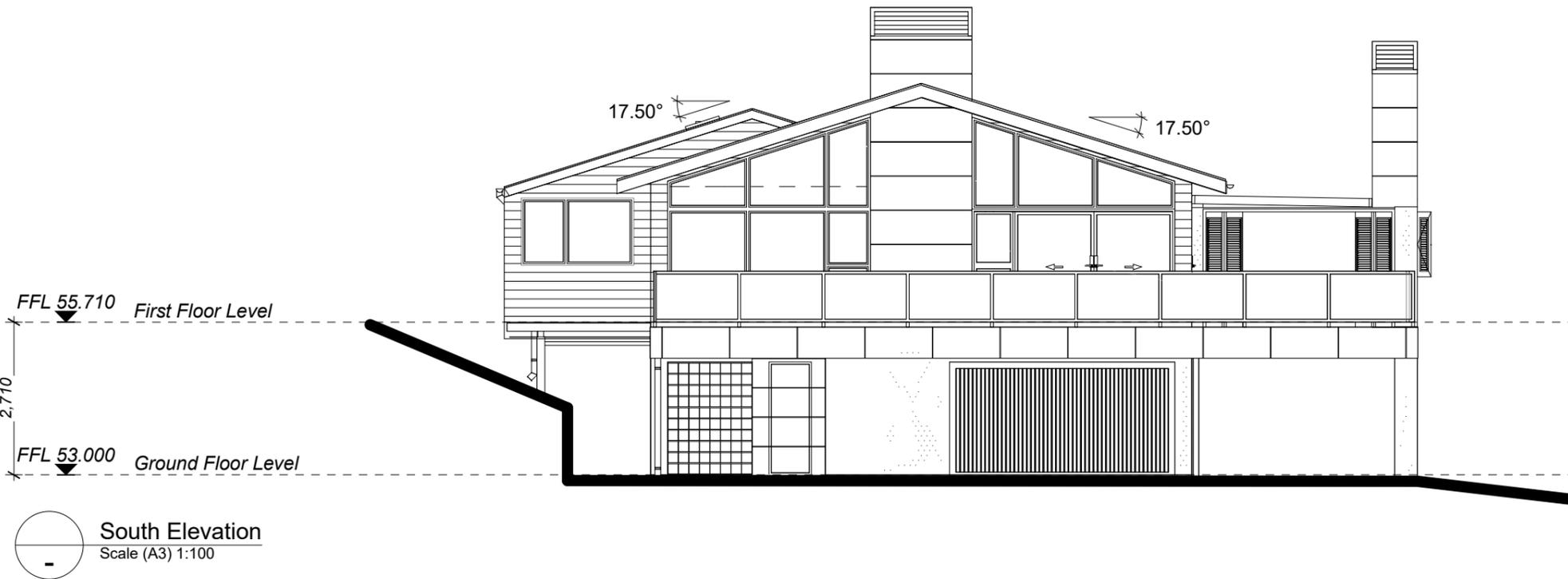
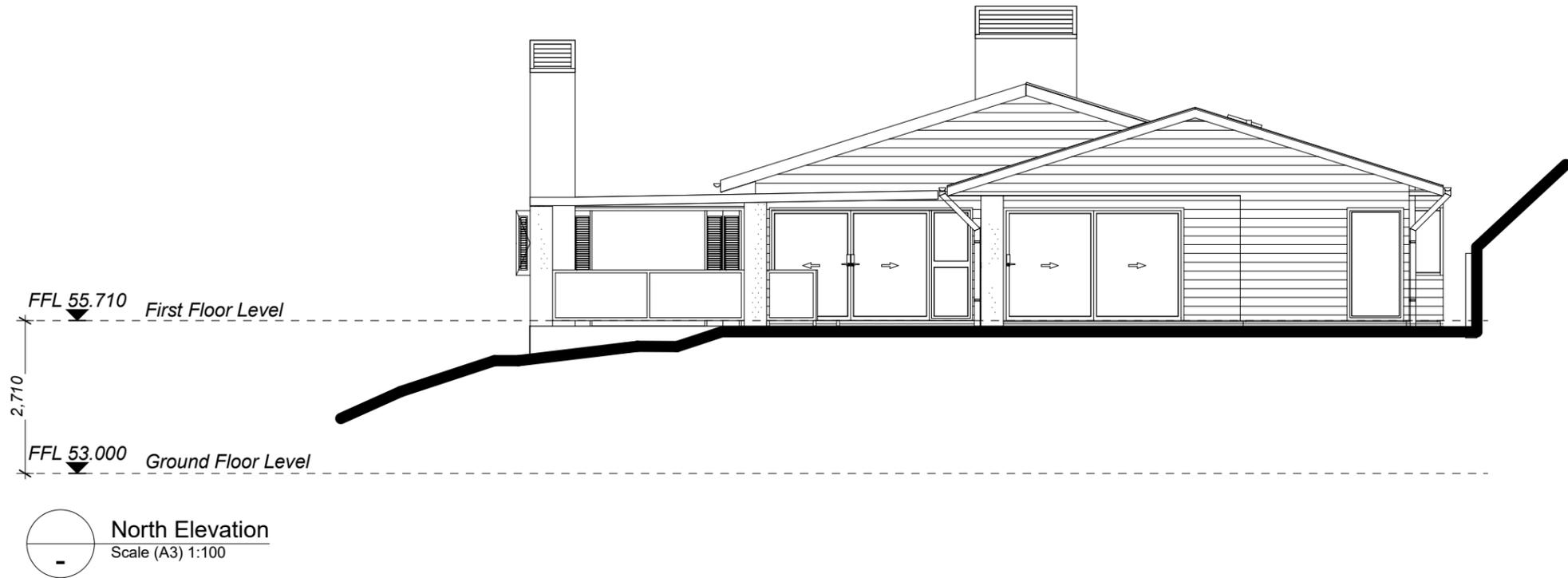




East Elevation
Scale (A3) 1:100



West Elevation
Scale (A3) 1:100

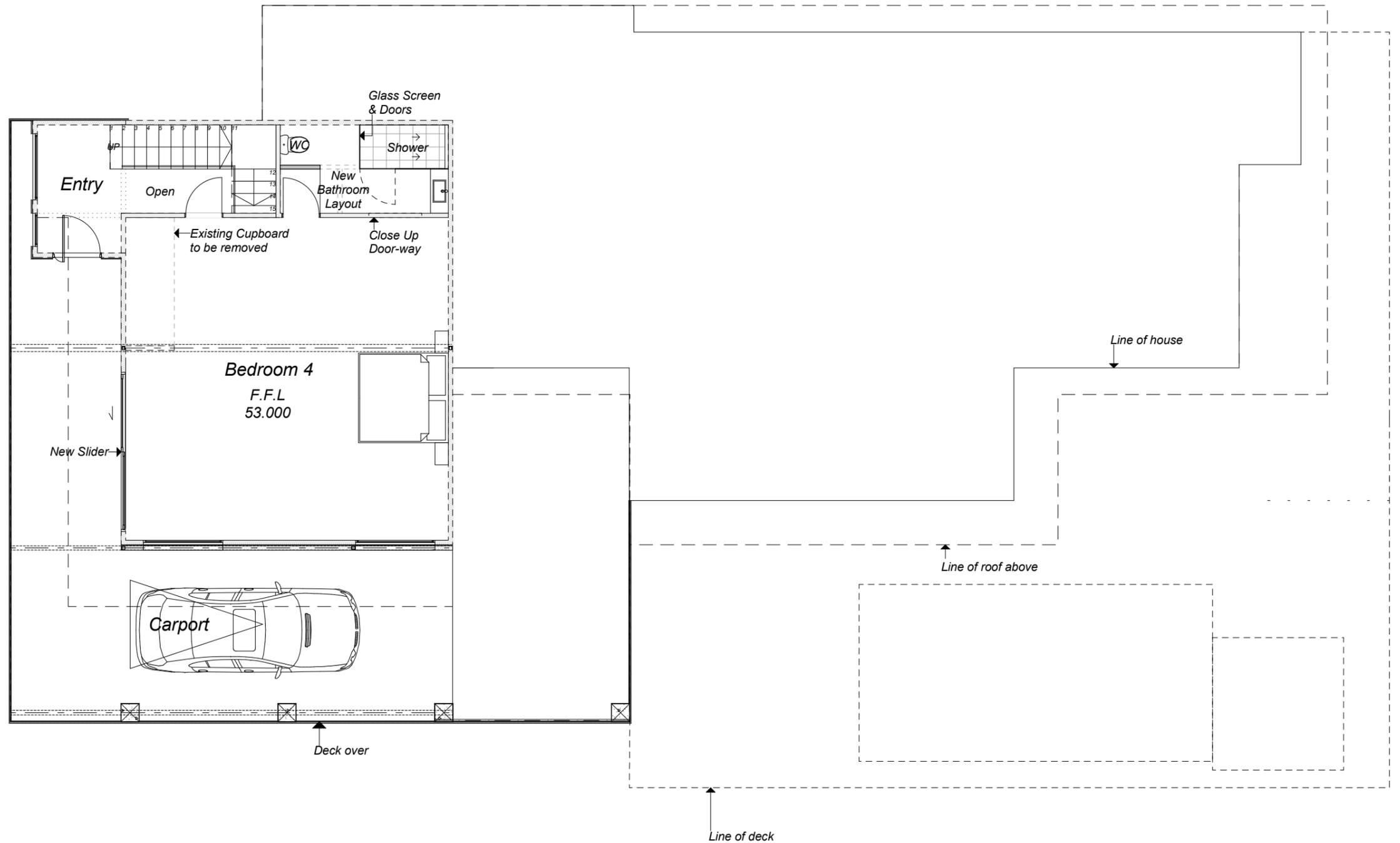


Legend

-  Existing masonry wall
-  Existing exterior timber-framed wall
-  Existing interior timber-framed wall
-  New interior timber-framed wall
-  New exterior timber-framed wall
-  Walls to be removed

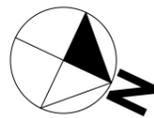


1 Ground Floor Plan
Scale (A3) 1:100

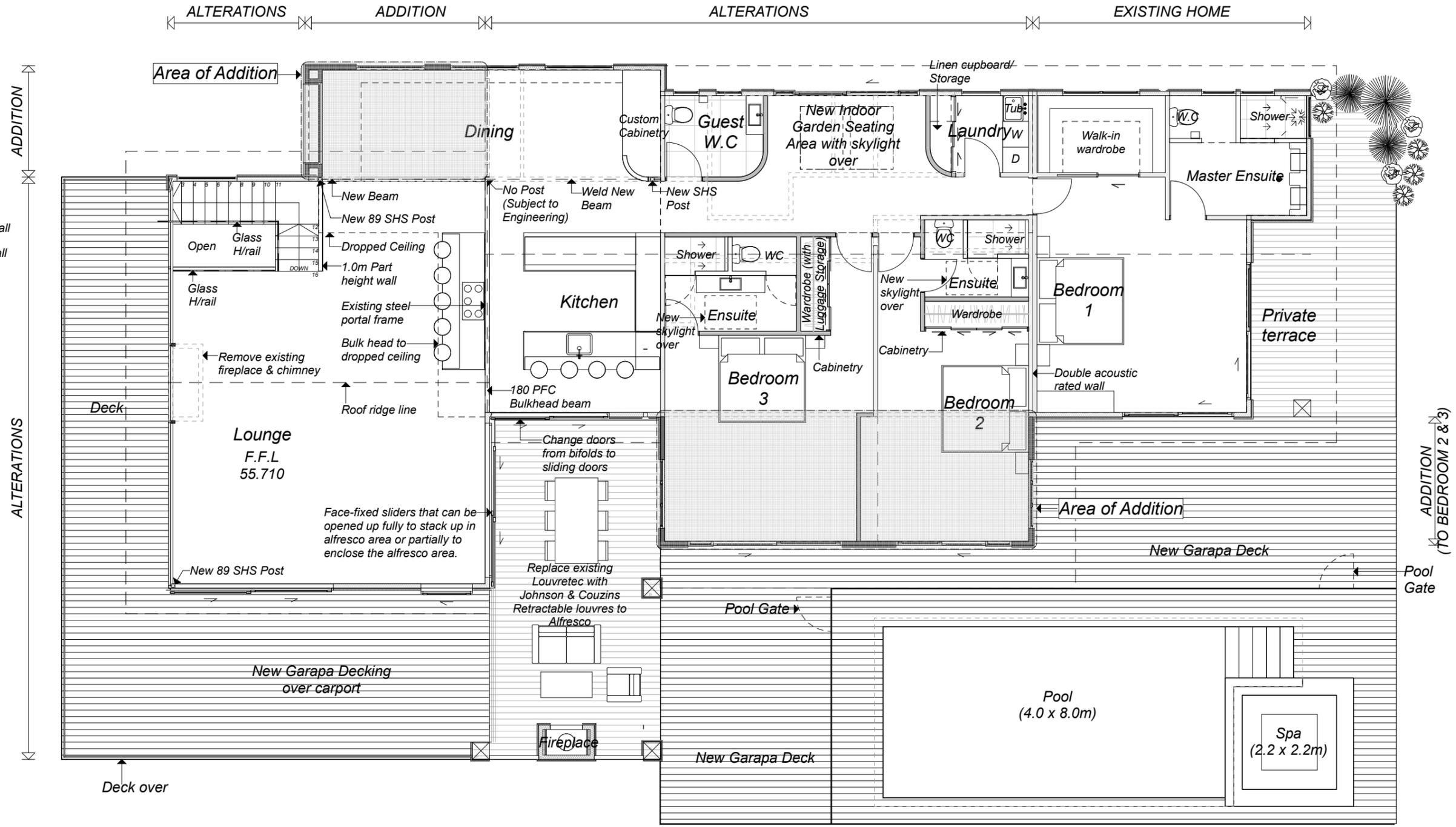


Legend

-  Existing masonry wall
-  Existing exterior timber-framed wall
-  Existing interior timber-framed wall
-  New interior timber-framed wall
-  New exterior timber-framed wall
-  Walls to be removed

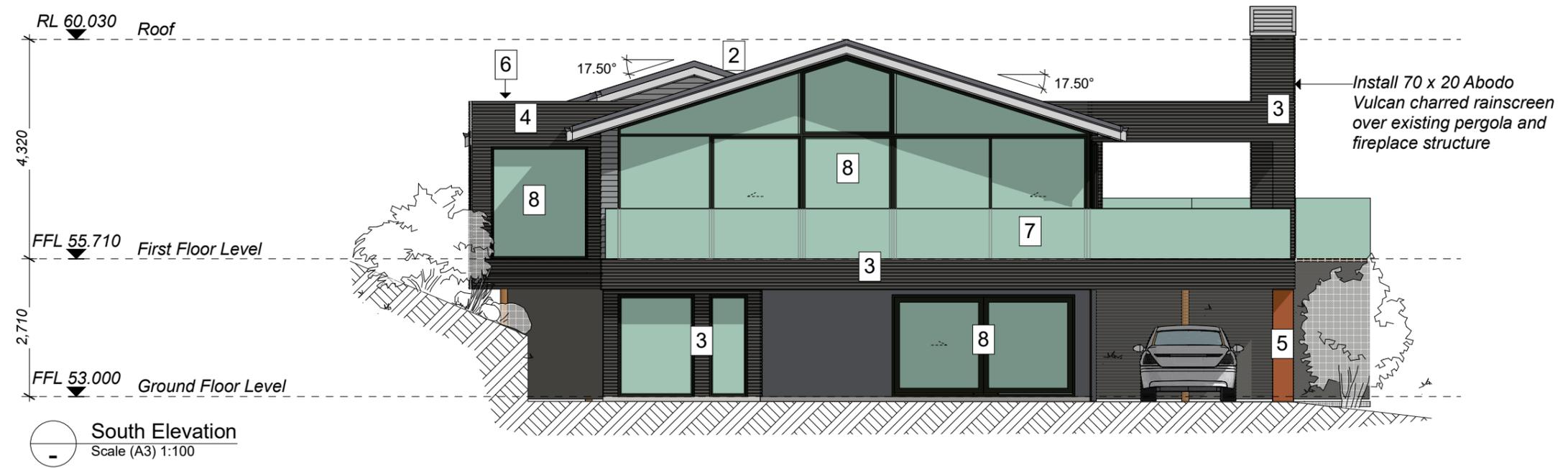


1 First Floor Plan
Scale (A1) 1:100



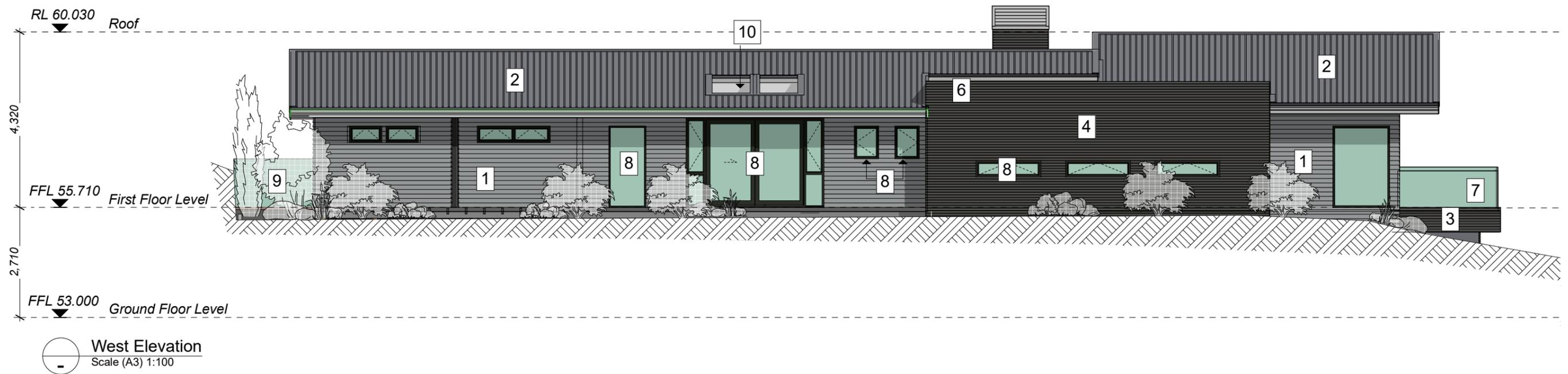
Legend

- 1 Existing Weatherboards
- 2 Existing Colorsteel Roof
- 3 70 x 20 Abodo Vulcan Charred rainscreen over existing cladding
- 4 Abodo Vulcan Charred Cladding over cavity on ply to all additions
- 5 Corten Steel Rainscreen on ground floor pilaster columns
- 6 Membrane to all parapet roofs
- 7 Glass Balustrading
- 8 New Aluminium Joinery
- 9 1.2m high Glass Pool Fence
- 10 New Skylight
- 11 Black painted Tad. Rad Pine dressed battens to screen pool and piles



Legend

- 1 Existing Weatherboards
- 2 Existing Colorsteel Roof
- 3 70 x 20 Abodo Vulcan Charred rainscreen over existing cladding
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APPENDIX C
WASTEWATER SITE PLAN

APPENDIX D
WASTEWATER TREATMENT SYSTEM SPECIFICATIONS

econo-treat

Econotreat VBB-P-2000 Treatment System

System Specifications & Installation Instructions



ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

New Zealand's Leaders in Advanced Secondary Treatment Systems

Compliance Requirements

All NaturalFlow Treatment Systems meet the requirements of the NZ Building Code G13-VM4.

Section 9 of AS/NZS 1546.1:2008 state that tanks constructed to these Standards will meet the requirements of the Code for Clauses B1 and B2, structure and durability.

Compliance with Section 9 of AS/NZS 1546.1:2008 and also Clauses G13.3.4 relating to on-site treatment and disposal systems and G14.3.1 and 14.3.2 relating to the control of foul water as an industrial waste are covered in the 'NaturalFlow Compliance Requirements' document.

Please feel free to ask for a copy of this complete document, if required.

The Treatment Process

Primary Chamber / Tank

Influent enters the chamber via the source whereby scum and solids capable of settling are separated from the raw influent. Primary treated effluent flows through a transfer port to the aeration tank. This primary tank will also act as a storage chamber for sludge returned from the Clarification Chamber.

Aeration Chamber

Water enters from the Primary Chamber. Air is introduced into this chamber via an air blower to create an environment for aerobic bacteria and other helpful organisms to consume the organic matter present. The aeration tank is designed in a manner to help prevent short circuiting of the wastewater to ensure extended aeration. Media is present in the tank to support the growth of bacteria.

Clarification Chamber

The Clarification chamber is essentially a quiescent zone where suspended particles/solids are settled out of the water. These particles are returned to the Primary chambers via a sludge return which aids in further biological reduction, denitrification and providing a constant food supply rich in microbes supporting the system through periods of limited flows.

ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

New Zealand's Leaders in Advanced Secondary Treatment Systems

Tank Specifications

Tanks are injection molded with UV stabilized polypropylene, which is suitable material for wastewater treatment containment meeting all the requirements of Section 4.3.3 of AS/NZS 1547:2012. These tanks have an expected lifespan of 50 years.

Dual Chamber Septic Tank

3200L Nominal Capacity
2000mm Diameter
2038mm High

Aeration Tank

3200L Nominal Capacity
2000mm Diameter
2038mm High

Pump Chamber

450mm Diameter
2000mm High

Installation Location and Certification

These tanks are not designed for vehicle loads and shall be located no closer than 2m to a driveway, road frontage or a building. If for any reason the tank is located where vehicle traffic may drive over the tank or approach closer than 2m, or where it may be trampled on by farm stock then the tank should be protected by a concrete slab designed to support these loads. Surface water must also be diverted from flowing into the installation.

Installation must be certified to AS/NZS 1547:2012, the certificate to be issued and held by the regulatory authority.

High Water Table Installations

All tanks have been engineered and designed for maximum strength, in accordance with the NZC 3604. Clauses B1 and B2 for structure and durability, to withstand any hydraulic pressures, both lateral and uplift, created by high water table conditions.

In high water table installations, it is important to fill the tanks with water. This removes the hydraulic uplift and simplifies the installation. In extremely high-water tables, dead men can be laid in the bottom of the excavation and secured to the tank. Waterflow must be made aware of this early on in view of supplying a tank that is fit for purpose.

Plumbing Pipes and Fittings

All internal plumbing is done with PVC pipes with appropriate connections according to AS/NZS 1260 and AS/NZS 4130.

Backfill and Bedding

Place and bed to NZBC G13/AS2, using compacted granular metal, in layers not exceeding 100mm.

If in doubt contact the experts on 0800 SEWAGE or sales@waterflow.co.nz

ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

New Zealand's Leaders in Advanced Secondary Treatment Systems

Electrical

Electrical connection must be installed according to AS/NZS 3000 and the control and alarm system must be in a weatherproof housing located in a readily visible position.

Warranty

WATERFLOW NZ LTD warrants that the Econotreat System will be free from defects in material and workmanship for the following periods of time from the date of installation as set out in the following conditions:

1. Injection Molded Tank 15yrs
2. Roto-Molded Tanks 15yrs
3. Nitto Blower 3yrs
4. Irrigation Pumps 2yrs
5. Warranty of Operation covers the performance of the NaturalFlow System as connected to the effluent inflow for which they are designed, and has been installed to the criteria as set out in the relative installation instructions and procedures, and has an assigned Service/Maintenance contract in place with Waterflow NZ Ltd or it's appointed agent/s.

Warranty excludes defects due to:

- A) Failure to use the system in accordance with owner's manual.
- B) A force majeure event outside the reasonable control of WATERFLOW NZ LTD such as (but not limited to) earthquake, fire, flood, soil subsidence, ground water table variations or plumbing fault.
- C) Modifications to surrounding landscape contour after installation
- D) The actions of a third party
- E) The system required to bear loads (either hydraulic or biological) greater than that for which it was designed
- F) Any modifications or repairs undertaken without the consent of WATERFLOW NZ LTD
- G) Failure, where applicable, to fence and plant disposal field.



1st June 2014
Dean Hoyle
Managing Director

ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

Econotreat VBB-P-2000 Installation Instructions

The Econotreat system is to be installed or signed off by a registered Drain layer to the design specified by Waterflow NZ Ltd.

The following installation instructions and procedures followed correctly will ensure System performance is not compromised in any way.

1. Excavate two 2.5m x 2.5m level platforms at an appropriate depth to ensure adequate fall for inlet pipe from the source. This has to be installed on virgin ground. The two platforms are ideally on the same level and next to each other.
2. Lay 100mm of bedding metal on platform and place the Septic and Aeration tanks next to each other. As close as practically possible to minimize the connection distance between the tanks. The Pump chamber is placed between the tanks to one side.
3. Connect the two tanks with 100mm DWV. Connect the pump chamber using 32mm pressure PVC for the inlet and electrical cables, and 25mm pressure PVC for the sludge return.
4. Next connect the sludge return. This is a 25mm PVC pipe that come out of the side of the aeration tank, nest to the inlet. It is plumbed back to the connection on the septic tank, next to the outlet. It is important that this pipe is falling slightly or at minimum flat.



5. Trench from Dose Chamber outlet to disposal field and lay the 25mm alkathene feed line.
6. Take a minimum of 3 photos at this point to showing connections and back fill, to ensure correct installation for sign off.
7. Back fill around tanks. Using spoil from the excavation is fine, be aware that this will settle over time though.

Caution: System must be protected from excessive super imposed loads both lateral and top loads. E.g. loads from vehicular traffic. There needs to be at least 2m of clearance maintained around system.

If in doubt contact the experts on 0800 SEWAGE or sales@waterflow.co.nz

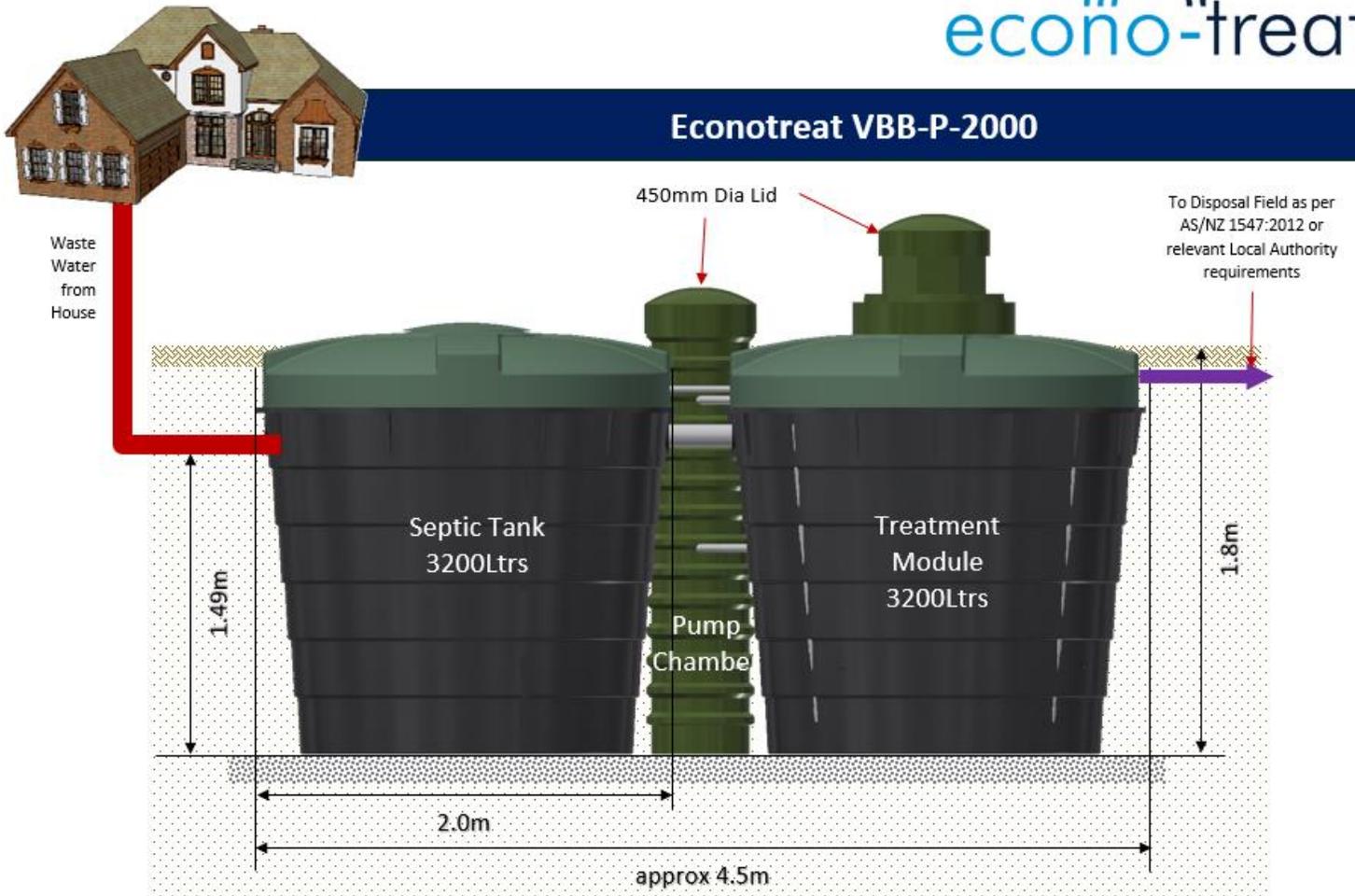
ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

Econotreat VBB-P-2000 Schematic Drawings



Econotreat VBB-P-2000



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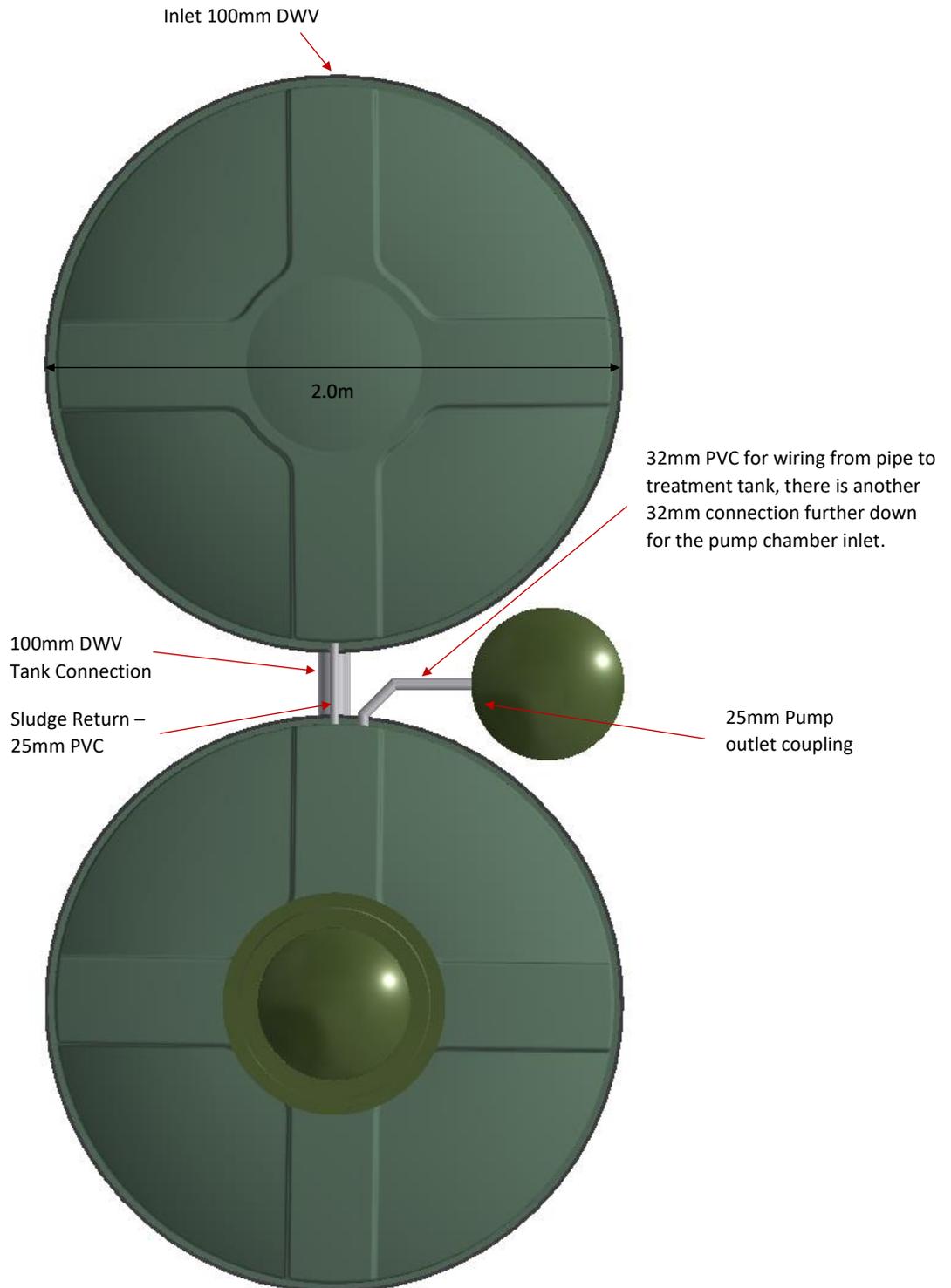
See our website: www.waterflow.co.nz

ECONOTREAT VBB-P-2000

System Specification & Installation Instructions

Econotreat VBB-P-2000 Schematic Drawings

Top View





"Making it Easy"

Call us today to discuss your needs

0800 SEWAGE

Or for more information www.waterflow.co.nz



Head Office
Waterflow NZ Ltd
1160 State Highway 12,
Maungaturoto
P. 09 431 0042

Waipapa Branch
Waterflow NZ Ltd
166 Waipapa Road,
Kerikeri
P. 09 407 8323

FF. 0800 SEWAGE
E. sales@waterflow.co.nz
www.waterflow.co.nz

APPENDIX E
PLANTS FOR WASTEWATER DISPOSAL AREAS

Auckland Regional Council Technical Sheet G-1

LIST OF WATER TOLERANT PLANTS SUITABLE FOR ON-SITE WASTEWATER DISPOSAL SYSTEMS

GENERAL MATTERS TO CONSIDER WHEN PLANTING A LAND DISPOSAL AREA:

Plants that are suitable for planting in moist conditions, such as those associated with wastewater land disposal fields need to be selected on the basis of both their tolerance for such moist conditions and for their potential for high level of growth/high transpiration of moisture in such conditions.

Standard lawn grass is a proven effective high transpiration plant species in such conditions, as are a large number of other plant species seen in typical domestic gardens.

Consideration needs to be given to effects of roots from plants and from trees in particular on wastewater distribution pipe networks/emitter lines in land application systems. Potential for root intrusion/disruption to the pipe system must be considered prior to selection and planting of a plant or tree species.

Advice on such matters for particular plant species can be obtained from garden centre specialists and landscaping consultants.

NATIVE PLANTS SUITABLE FOR MOIST CONDITIONS IN THE AUCKLAND REGION:

The following list covers native plant species are considered to be suitable for planting in moist conditions, such as those associated with wastewater disposal fields in Auckland situations. They are all tolerant or fond of moist conditions and all are native to the Auckland region. Much of this information has been adapted from one of the ARC Botanic Gardens advisory leaflets; "14 – New Zealand plants for wet places" and the list edited and reviewed by Dr. Rhys Gardner Consulting Botanist, Auckland War Memorial Museum (August 2004).

Grasses, ground covers, and other plants

***Astelia grandis* (swamp astelia)**

Large clump forming plant with bright green, flax-like foliage. Female plants produce upright panicles of orange berries in the centre of the plant. This endemic species will not tolerate eutrophic conditions and prefers peat soils.

***Blechnum novaezealandiae* (kiokio)**

Large, robust fern growing to 1 or even 2m, Hardy species that tolerates most conditions, but does best in well drained, shady areas.

Carex

There are many members of this genus which grow naturally in damp to wet areas. They all have quite fine drooping foliage and are vigorous in moist conditions. Most prefer very light shade.

The following species have been identified for their suitability:

Carex dissita

Endemic species with dull green to reddish tufts often 0.5m tall (although this can vary).

Tolerates a range of swampy habitats, but is also noted to grow on drier soils under forest cover.

Carex flagellifera

Endemic species with dense spreading reddish-brown tufts to 0.5m tall. Prefers damp soil and full sun, but is noted to thrive in a variety of habitats including boggy pasture.

Carex geminata

Robust and vigorous endemic species that grows to 1.5m tall. Thrives in a range of wet habitats. Suitable for a larger area.

Carex lessoniana

Robust and vigorous endemic species that grows to 1.5m tall. Similar to *C.geminata* in that the species is spreading and suitable for a larger wet area.

***Carex secta* (purei, makura)**

Endemic species that exhibits tall spreading tussocks. Has been noted to grow to 3m tall, widespread in swampy areas. Useful in the creation of bird habitat.

Carex virgata

Endemic species that forms dense, light green tussocks up to 1m tall. Thrives in a variety of habitats including swamps, drain margins, seepages and wet pastures. Useful in the creation of bird habitat.

***Cortaderia fulvida* (toetoe)**

Branching from the base and forming a clump to 4m high. Long strap-shaped leaves with red-orange coloured veins, flower heads cream yellow. New shoots exhibit pale waxy cover on lower parts (unlike pampas grass) Prefers good drainage and semi-shade. Will struggle to compete if dried out in summer.

***Cyperus ustulatus* (toetoe upoko-tangata, giant umbrella sedge)**

Vigorous leafy sedge growing to 1m in open damp places. Tolerates immersion in standing water within a range of habitats from seepages to wetlands.

***Dicksonia squarrosa* (wheki, tree fern)**

Tree fern up to 7m tall that exhibits tolerance of wet open ground, and floods. Found to shelter and accumulate with other native plants. The base of the fern attracts biodiversity. Useful application to streambank and seepage habitats.

***Elatostema rugosum* (parataniwha)**

Herbaceous plant up to 0.5m tall that spreads by rhizomes. Bronze coloured foliage with serrated edge. Grows on moist sites in light to heavy shade. Intolerant of dry habitats.

Hypolepis dicksonioides

Large fern that prefers fertile moist, but well-drained ground, grows vigorously and spores into planted areas with abundance. Does however, die back during winter.

***Phormium tenax* (harakeke, flax)**

Fast growing clump-forming flax with large stiff leaves, to 3m. Full exposure and sun. Moist to wet conditions. Does not have deep or wide roots. Easily propagated from split fans or grown from seed. Attracts birds, especially Tui.

Trees and shrubs

Consideration needs to be given to the effects of roots land application on wastewater distribution pipe networks. This problem can be more significant for large tree species.

***Carpodetus serratus* (putaputaweta, marbleleaf)**

Lowland forest tree up to 7m tall. Large bunches of cream coloured flowers appear in spring followed by black berries.

Coprosma areolata

Species that grows to 4m tall. Low tolerance to drought, with medium to high fertility.

***Coprosma robusta* (karamu, shining karamu)**

Shrubs or small trees growing to 3m+, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. Hardy plant.

***Coprosma tenuicaulis* (swamp coprosma)**

Endemic species that grows to 3m tall. Leaves pale green with slender branches. Will tolerate a range of swampy to boggy habitats including standing water.

***Cordyline australis* (ti kouka, cabbage tree)**

Palm-like in appearance with large heads of linear leaves and panicles of scented flowers. Sun to semi-shade. Prefers damp to moist soil. Grows eventually to 12m+ height.

***Dacrycarpus dacrydioides* (kahikatea, white pine)**

Tree that grows to 40m. Moderately growing species, which prefers wetland and boggy environments. Application of this species must consider the possible impact of its root systems on the wastewater disposal field.

***Geniostoma rupestre* (hangehange)**

Common forest shrub with pale green glossy foliage, growing to 2-3m. Tiny flowers give off strong scent in spring. Looks best in sunny position where it retains a bushy habit, and prefers well-drained soil.

***Hebe stricta* (koromiko)**

Shrub or small tree growing to 2-5m in height. Natural forms have white to bluish flowers. Plant in full sun. Tolerates exposure. (NB Many cultivars and hybrids are available commercially, but these are all unsuitable for use near existing natural vegetation.)

***Laurelia novae-zelandiae* (pukatea)**

Large upright tree (to 30m) with attractive bright green foliage and distinctive whitish bark. Fast growing and able to handle a wide variety of soils. It will tolerate periodic flooding, breathing roots develop in water logged soils. Can be grown from seed. Tolerant of some sun and frost. Not tolerant of wind.

***Leptospermum scoparium* (manuka)**

Shrub or small tree growing to 4m+ in height. Ubiquitous shrub varying in form throughout New Zealand. Ideal to provide shelter for other plants as it is quick growing and hardy. Requires full sun and. Hardy and tolerant of difficult conditions, including waterlogging and drought.

***Melictyus ramiflorus* (mahoe)**

A fast growing yet long lived tree to 7m height. Prefers well drained fertile soils. Tolerates some frost, wind and sun Birds are attracted to the blue berries.

***Pennantia corymbosa* (kaikomako)**

Slow growing species that will reach 12m in moist, fertile sites. Useful species application in bank stabilisation or wetland habitats.

***Plagianthus betulinus* (ribbonwood)**

Fast growing species to 15m. Similar application to that of *Pennantia corymbosa*.

***Rhopalostylis sapida* (nikau)**

New Zealand's only native palm, with red berries attractive to birds. Requires light shade, plenty of moisture and protection from wind when young. Grows well in areas of permanent dampness.

***Syzygium maire* (maire tawake)**

Attractive and moderately growing wetland tree to 15m with bronze foliage, large bunches of reddish fruit and distinctive whitish bark. Requires a sheltered sunny position. Tolerates some frost.

***Vitex lucens* (puriri)**

Fast growing to 20m in fertile, open but sheltered conditions. Will struggle with poor drainage during adolescence.

APPENDIX F
PS1 AND AGREEMENT TO PROVIDE PS4

Producer statement design (PS1)

TO BE COMPLETED BY THE DESIGN PROFESSIONAL WHO HAS BEEN ENGAGED TO PROVIDE A PS1

Author name: Author number:

Author company:

Building consent N°:

Site address:

Legal description:

Engaged by: (Owner)

To provide design services in respect of: part all

NZBC clauses: (circle as applicable)

B1	B2	C1	C2	C3	C4	C5	C6	D1	D2	E1	E2	E3
F1	F2	F3	F4	F5	F6	F7	F8	G1	G2	G3	G4	G5
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	H1		

NB: all statements must include B2

The design has been prepared in accordance with:

Documents issued by the Ministry of Business Innovation & Employment (verification method / acceptable solution)

Alternative solution (attach schedule if required)

The proposed building work covered by this producer statement design is described on the drawings referenced below, together with the specifications and other documents set out in the schedule attached to this statement:

Drawing title: Drawing numbers:

The producer statement is subject to:

(i) Site verification of the following design assumptions:

(ii) All proprietary products meeting their performance specification requirements

I believe on reasonable grounds that the proposed building work, will comply with the relevant provisions of the Building Code if constructed in accordance with the drawings, specifications and other documents provided or listed with this statement.

I understand that Auckland Council is reliant on this producer statement for the purposes of establishing compliance with the relevant provisions of the Building Act 2004, Building Regulations and Building Code. I confirm that I hold a current policy of professional indemnity insurance to the value required by Auckland Council.

Construction monitoring is: Not required Required (if required please list below)

(Agreement must be attached)

Signed by: Date:

Address: Postcode:

Phone: Fax:

Mobile: Email

COMMENTS

Important notes:

- Producer statements are accepted solely at Auckland Council's discretion; please refer to the Producer Statement Policy which can be found on Councils website for further details <http://www.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/consents/Consent%20documents/ac2301producerstatementpolicy.pdf>

Agreement to provide a producer statement during construction



Producer statement construction (PS3) or producer statement construction review (PS4)

I, being the owner / agent confirm that I have engaged the following producer statement author(s) **listed on the reverse side** of this document to be responsible for carrying out construction (PS3) or observing and supervising construction (PS4)

Name:	<input type="text" value="Gareth Williams"/>	<input type="checkbox"/> Owner <input type="checkbox"/> Agent
Signature:		Date: <input type="text"/>
Building consent number (if known)	<input type="text"/>	
Address of project:	<input type="text" value="13 Church Bay Road, Waiheke Island"/>	

Important notes:

In order to approve a building consent, Council must be satisfied on reasonable grounds that the provisions of the Building Code will be met. Council must also be satisfied that the building work is constructed in accordance with the building consent and Building Code before it can issue a code compliance certificate. Producer statements are a mechanism used for establishing compliance with the Building Code and are a cost-effective alternative to Council undertaking design reviews and inspections itself.

In some instances, building work that is specifically designed may require specialist installation / supervision. Where these elements are identified, the owner / agent may enter into an agreement with Council, to provide a producer statement to support compliance.

*This form serves as acknowledgement by the owner/agent that a producer statement will be provided on completion of the building work to which it relates. If at the time of application, the design professional or contractor details are unknown, please complete all other fields of this form noting the words **“to be advised”** in the author’s name field.*

Producer statement construction (PS3) *If an owner / agent intends to provide a PS3 for internal waterproofing or installation of a heating appliance in lieu of an inspection the author must be on Councils Producer Statement Register and the author **must** phone the Call Centre on (09) 301 0101 to advise they will be performing the work. At this time Council staff will check and confirm the author is on the Register and if so, record the contractor’s details against the building consent. An inspection is not required for this work. All other work performed by a contractor must be inspected and supported by a producer statement.*

Producer statement construction review (PS4) *Producer statements must be supported by way of site observation records and instructions, diary notes, testing and commissioning certificates, warranties, or such documents applicable to the construction, which has been undertaken / observed / supervised.*

On completion of the building work, Council will rely on the producer statement and supporting documentation when making its decision on whether to issue a code compliance certificate. All producer statement authors must be listed on the Auckland Council Producer Statement Register; the register can be found on the Councils website @ www.aucklandcouncil.govt.nz .

Please note *that whilst every effort is made to identify producer statement requirements at consent stage; it may be possible that further information is required during construction and prior to the issue of the Code Compliance Certificate.*

Tick if applies	Description of work (delete items not applicable)	Producer Statement Authors name (If unknown, write TBA)	Approved author #	Type
<input type="checkbox"/>	Geotechnical - soil conditions, soil compaction, earthworks, excavations on boundary, etc			PS4
<input type="checkbox"/>	Foundations, piling, masonry (Type A, B or C), compaction of hard-fill, drain bridging, raft slab			PS4
<input type="checkbox"/>	Pile driving			PS3 PS4
<input type="checkbox"/>	Internal waterproofing membranes			PS3
<input type="checkbox"/>	External waterproofing membranes			PS3
<input type="checkbox"/>	Heating appliance			PS3
<input type="checkbox"/>	Stormwater management devices			PS4
<input type="checkbox"/>	Waste water systems			PS4
<input type="checkbox"/>	Swimming pool			PS4
<input type="checkbox"/>	Precast and pre-stressed concrete			PS3 PS4
<input type="checkbox"/>	Structural steel / portal frames			*
<input type="checkbox"/>	Facade systems			PS4
<input type="checkbox"/>	Installation, testing & commissioning certificates for fire safety systems			*
<input type="checkbox"/>	Inspection & test plan (ITP) structural steel welding			*
<input type="checkbox"/>	Fire safety systems			PS3
<input type="checkbox"/>	Fire protection – interior surface finishes, floor coverings & suspended flexible fabrics			PS3
<input type="checkbox"/>	Fire protection – intumescent coatings to structural steel			PS3
<input type="checkbox"/>	Passive fire protection - stopping of fire rated walls, floors, ceilings & penetrations			PS3
<input type="checkbox"/>	Heating ventilation & air-conditioning (HVAC)			PS4
<input type="checkbox"/>	Proprietary product installation			PS3
<input type="checkbox"/>	Racking			PS4
<input type="checkbox"/>	Seismic performance			PS4
<input type="checkbox"/>				
<input type="checkbox"/>				

* Refer to conditions of consent for type of producer statement and certification requirements