

STORMWATER MANAGEMENT REPORT

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

STEVE BERNSTEIN & KEITH FLAMANK
October 2022 | V1



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1 INTRODUCTION

This report was prepared by GWE Consulting Ltd (GWE) for Steve Bernstein & Keith Flamank as our clients. The purpose of this report is to assess hydrological conditions and to provide a suitable design for the discharge of stormwater from the site.

2 SCOPE OF WORK

The scope of work as described in our letter of engagement dated 31 August 2022, is outlined below.

Stormwater

Preparation of a design report to accompany the Resource Consent (RC)/Building Consent (BC) application:

- *Review available background information and proposed development plans. Undertake desktop gap analysis and identify additional information required.*
- *Review relevant planning rules and establish stormwater provisions for the site.*
- *Detailed design of On-site SMAF mitigation devices to support RC/BC application if required.*
- *Preparation of stormwater management report to support RC/BC application.*
- *Prepare stormwater drainage plan showing indicative sizing and locations for stormwater infrastructure and connections.*

3 SITE DESCRIPTION

The subject site is at 13 Church Bay Road, Waiheke Island and is legally described as Lot 9 DP 68070. The property is zoned as a Hauraki Gulf Island Zone with a total area of 2,023 m². The site is approximately rectangular in shape and is accessed off Church Bay Road via an existing concrete driveway at the south-east corner of the property. The property is bordered by similar residential properties with Church Bay Road to the south-east of the property.

The site is developed with a dwelling to the central north-west of the property. The existing topography can be described as gentle to moderate sloping from the north-west to the south-east corner of the subject site. The site shows gentle sloping of approximately 10 degrees with steeper slopes at the north-western boundary. Majority of the site is well vegetated with grassed lawn and a few mature trees.

Auckland Council GeoMaps (GeoMaps) indicates the site is not impacted by any 100-year floodplain and there are no overland flow paths traversing through the property. There is no public stormwater network for connection to service the subject site.

Refer to Figure 1 for the site location.



Figure 1: Site Location – 13 Church Bay Road, Oneroa

Source: [Auckland Council GeoMaps](#)

3.1 Overlays

The site is zoned as Island Residential 2 (Bush Residential) in the Hauraki Gulf Islands Section – Operative in Part 2018 of the Auckland Council District Plan and is located within a Stormwater Management Area Flow (SMAF) 1 & 2 zone.

The following overlays apply to the site:

- Natural Resources: High-Use Aquifer Management Areas Overlay [rp] – Waiheke Aquifer.
- Controls: Macroinvertebrate Community Index – Rural.
- Controls: Macroinvertebrate Community Index – Urban.
- Controls: Stormwater Management Area Control – MATIATIA, Flow 1.
- Controls: Stormwater Management Area Control –BLACKPOOL, Flow 2.

The property flows into a SMAF 2 zone catchment; therefore, our design will consider the property to be located within SMAF 2.

4 PROPOSED DEVELOPMENT

A set of architectural plans have been supplied to GWE indicating the existing site layout and proposed development at the property. The drawings were prepared by Lighthouse Ltd (dated 12 October 2022) and include site plans, floor plans and elevations. Refer to Appendix A for the architectural drawings.

Based on the drawings, GWE understands that the existing dwelling is to be altered to accommodate a 4-bedroom dwelling with the addition of a few new features such as a pool/spa. No changes are proposed to the existing driveway/vehicle crossing.

The site currently contains two concrete 7,500 and 5,000 gallon water tanks at the rear of the site that are to be maintained. It is proposed that an additional 25,000 L water tank be added for additional storage.

The stormwater design is based on the Architect’s proposed site plan and information from Auckland Council GeoMaps, which have been adapted for our purposes. Refer to Table 1 for the existing and proposed impervious areas for the site.

Table 1: Existing and Proposed Impervious Areas

	EXISTING (m ²)	PROPOSED (m ²)	DIFFERENCE (m ²)
Dwelling	318	363	+45
Driveway	186	186	--
Total Impervious Area	504	549	+ 45
Percentage Impervious	24.9 %	27.1 %	+ 2.2 %
Total Pervious Area	1,519	1,474	- 45
Total Site Area	2,023	2,023	--

Notes:

* Areas are taken from architectural drawings by Lighthouse Ltd, dated 12 December 2022.

*Total Impervious Area excludes the pool and spa as these are considered self-mitigating areas.

5 STATUTORY ASSESSMENT

Stormwater in the Auckland region is managed by planning rules in the Auckland Unitary Plan (Operative in Part), as described below.

5.1 Auckland Unitary Plan (AUP)

5.1.1 E8 – Stormwater Discharge and Diversion

Diversion and discharge of stormwater runoff from impervious areas onto or into land or into water or to the coastal marine area:

All activities that involve the diversion and discharge of stormwater runoff are required to meet the General Standards set out in Part E8.6.1 of the Unitary Plan.

Diversion and discharge of stormwater runoff from impervious areas up to 1,000 m² within an urban area where a connection to a stormwater network is not possible is a Permitted Activity subject that it complies with Standard E8.6.1 of the Auckland Unitary Plan. Refer to Section 7.1 of this report.

5.1.2 **E9 – Stormwater Quality**

Not Applicable. Proposed parking areas will be covered/designed for less than 30 vehicles.

5.1.3 **E10 – Stormwater Management Area – Flow 1 and Flow 2**

Development of new or redevelopment of existing impervious areas up to 50 m² within Stormwater Management Area Control – Flow 1 (SMAF 1) or Stormwater Management Area Control – Flow 2 (SMAF) that complies with Standard E10.6.1 of the Auckland Unitary Plan is a Permitted Activity. Refer to Section 7.2 of this report.

5.2 **Auckland Council District Plan – Hauraki Gulf Islands Section – Operative**

For all sites less than 2,000 m² in gross site area in Island Residential 2 zone and the slope of the land around buildings and impervious surfaces is less than or equal to 1 in 4, the total impervious surface must not exceed 30 percent of the gross site area.

6 **STORMWATER MANAGEMENT**

6.1 **Reference Documentation**

The following documentation was referenced in the stormwater management design for the development:

- Compliance Document for New Zealand Building Code Clause E1 Surface Water
- Auckland Regional Council Technical Publication TP108 Guidelines for Stormwater Runoff Modelling in the Auckland Region
- Auckland Council Code of Practice for Land Development and Subdivision – Chapter 4 Stormwater
- Auckland Council Technical Report 2013/035 Stormwater Management Provisions: Technical basis on contaminant and volume requirements
- Auckland Council Technical Report 2013/018 Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices

6.2 **Design Considerations**

6.2.1 **Requirements for Treatment**

The proposed development does not have high contaminate generating activity. On-site mitigation such as leaf guards, retention/detention tanks, and catchpits will provide treatment of impervious areas.

6.2.2 SMAF

The development of new or redevelopment of existing impervious areas are less than 50 m². The stormwater design will therefore be consistent with the architectural plans. SMAF retention and detention will not be required as the activity complies with Standard E10.6.1 of the Auckland Unitary Plan is considered a Permitted Activity.

6.2.3 Stormwater Attenuation

GeoMaps has indicated that there are residential sites downstream of the subject site that are at risk of flooding. However, these are located near the bottom of the catchment. The subject site is located at the top of the catchment with proposed additional impervious areas totalling less than 50 m² with the increase in peak flow from the site to be considered negligible compared to the catchment below, therefore peak flow attenuation for the 2 year and 10 Year ARI storm event is not required on-site.

6.3 Collection and Runoff from Impervious Area

6.3.1 Roof Areas

The proposed development consists of additions and alterations to the existing dwelling to increase the number of bedrooms to four. A minor increase in roof area is proposed of 45 m².

Runoff from the proposed roof areas can be collected in either of the two existing 7,500 and 5,000 gallon concrete water tanks or the proposed new 25,000 L tank to provide potable and non-potable water for the subject site. Details of onsite drainage layout is to be detailed by the architect at building consent stage.

6.3.2 Driveway Areas

Driveway areas are existing and will remain untouched onsite. Therefore, runoff will follow existing drainage paths. There is an existing channel drain along the northern edge of the driveway which connects with the existing overflow pipe from the rainwater tanks, flowing south along the boundary. The remainder of the driveway sheet flows to surrounding pervious area and down towards Church Bay Road.

6.3.3 Collection

Loading

All drainage fittings (lids, chambers, frames, grates, covers, etc.) to be supplied to meet the following loading classes as a minimum:

- AS3996 Class A (Extra Light Duty) or EN 1433 Class A may be used in patio areas, gardens and other areas without vehicle access.
- AS3996 Class B (Light Duty) or EN 1433 Class B in residential driveways/parking areas unless specified otherwise.

Catchpits

Catchpits should be constructed to NZBC E1/AS1 Figure 8 (Type-one Surface Water Sump) or Figure 9 (Type-two Surface Water Sump) with the appropriate lid, frame and grate to match the application.

Slot Drains

Slot drains should only be used where areas cannot be laid to fall to surface channels or spread-entry treatment devices without significant problems such as trip hazards, excessive gradients or surface water inconvenience in areas of heavy pedestrian activity. Every slot drain must discharge to a catchpit designed to suit that channel system.

Paved Areas

Sealed and compacted gravel driveways, and parking areas are to be constructed with a minimum 2% crossfall towards catchpits, drains and channels to provide adequate drainage and to reduce potential for ponding.

Pipework

All pipework shall be minimum 80 mm uPVC diameter with sealed joints unless specified otherwise. All pipework shall be installed per manufacturers recommendations and to meet NZBC E1 Acceptable Solutions. The general arrangement and location of the pipework is shown on the site plan but should be confirmed on-site once finished levels have been confirmed.

Subsoil Drains

All subsoil drains (from new retaining walls for example) are to be directed to silt traps prior to discharge. Subsoil drains shall be punched, corrugated polyethylene, 110 nominal diameter Novaflo pipe wrapped in geofabric sock or similar approved.

6.4 Water Treatment

The development will be residential in nature. The key contaminant risks for the site are:

- Sediments washed from impervious surfaces and from subsurface drainage.
- Leaf matter and other organic debris.
- Gross pollutants.

Stormwater treatment on-site will include:

- Leaf guards on roof guttering/first flush devices on roof guttering and downpipes.
- Sedimentation in the rainwater tanks.
- Collection of flows from subsurface drainage in silt traps or catchpits prior to discharge.

The risk of other contaminants being discharged in the stormwater system (hydrocarbons, metals, etc.) that will affect downstream water quality is considered low.

6.5 Discharge

Overflow from the rainwater tanks plus runoff from the existing driveway channel drain will be collected within the existing 110mm diameter Novacoil stormwater pipe running south along the north-east boundary. Refer to drawing J3922-400 in Appendix B for the approximate location. This pipe discharges to ground approximately 20 m from Church Bay Road, however flows look to be directed towards the neighbouring site 13 Church Bay Road. It is proposed that the pipe be extended further down the boundary buried or surface laid, and a rip rap of rocks be placed downstream of the discharge pipe to reduce scour and erosion at the discharge location south-east of the property. Refer to J3922-400 in appendix B for the approximate location and drawing J3922-410 in for details.

7 ACTIVITY STANDARDS

7.1 Stormwater Discharge and Diversion

7.1.1 General Standards

1. *The design of the proposed stormwater management device(s) must be consistent with any relevant precinct plan that addresses or addressed stormwater matters.*

There is no applicable precinct plan for the subject site.

2. *The diversion and discharge must not cause or increase scouring or erosion at the point of discharge or downstream.*

The discharge of stormwater runoff to land follows through the existing stormwater discharge pipe. A rip rap is proposed at the end of the open pipe to reduce scour and erosion at the discharge location

3. *The diversion and discharge must not result in or increase the following:*
 - a. *Flooding of other properties in rainfall events up to the 10 percent annual exceedance probability.*
 - b. *Inundation of buildings on other properties in events up to the 1 per cent annual exceedance probability.*

GeoMaps indicates that there are residential sites downstream of the subject site that are at risk of flooding however with the site located at the top of the catchment, the proposed development is negligible compared to the catchment contributing to the flooding. The proposed development will therefore not increase the downstream flood risk.

The diversion and discharge must not cause or increase nuisance or damage to other properties.

It is proposed to discharge the overflow from the tanks to the land downslope of the proposed dwelling. The design of the discharge has been undertaken to match existing drainage patterns and reduce the potential for scour. Any effect on neighbouring properties is considered to be nil or less than minor.

4. *The diversion and discharge of stormwater runoff must not give rise to the following in any surface water or coastal water:*
 - a. *The production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;*
 - b. *Any conspicuous change in the colour or clarity;*
 - c. *Any emission of objectionable odour;*
 - d. *The rendering of fresh water unsuitable for consumption by farm animals;*
 - e. *Any significant adverse effects on aquatic life.*

The development will be residential in nature. The key contaminant risks for the site are:

- Sediments washed from impervious surfaces and from subsurface drainage.
- Leaf matter and other organic debris.
- Gross pollutants.

Stormwater treatment on-site will include:

- Leaf guards/first flush devices on roof guttering and downpipes.
- Sedimentation in the rainwater tanks.
- Collection of runoff from impervious areas in slot drain/catchpits prior to discharge.
- Collection of flows from subsurface drainage in silt traps prior to discharge

The risk of other contaminants being discharged in the stormwater system (hydrocarbons, metals etc) that will affect downstream water quality is considered low.

7.2 Stormwater Management Areas

7.2.1 General Standards

All activities listed in Table E10.4.1 Activity table, other than (A1): Development of new or redevelopment of existing impervious areas within Stormwater Management Area Control – Flow 1 or Stormwater Management Area Control – Flow 2 that are not directed to a stream or are discharged below RL 1.7 m must meet the following standards, unless otherwise specified.

1. *Hydrology mitigation must be provided and must meet one of the following:*
 - a. *must be provided on the same site (or in the case of a road, motorway or state highway within the road reserve or land under the control of the road controlling authority) as the new or redeveloped impervious area; or*
 - b. *where the hydrology mitigation requirement is provided by an authorised off-site stormwater management device or system, all of the following must be met:*

- i. *the system must be designed, constructed and operated to receive and manage stormwater from the impervious area of the site; and*
- ii. *a copy of authorisation (such as a discharge consent or subdivision consent notice on title) must be provided to the Council, along with confirmation from the operator of the device or system that hydrology mitigation requirements will be achieved for the additional stormwater from the site.*

The proposed hydrological mitigation devices will be located on site.

2. *Any stormwater management device or system must be built in accordance with design specifications by a suitably qualified service provider and must be fully operational prior to use of the impervious area.*

The installation of all stormwater infrastructure will be undertaken in accordance with the following standards (in order of precedence):

- i. Manufacturers recommendations for proprietary devices.
 - ii. The construction specification provided by the Engineer at the time of construction.
 - iii. Compliance Document for New Zealand Building Code Clause E1 Surface Water.
 - iv. Auckland Council Code of Practice for Land Development and Subdivision – Chapter 4 Stormwater.
 - v. Auckland Transport Code of Practice – Chapter 17 Road Drainage.
3. *'As built' plans for any stormwater management device or system must be provided to Council within three months of practical completion of the works.*

To be supplied after construction.

4. *Any stormwater management device or system must be operated and maintained in accordance with best practice for the device or system.*

An operation and maintenance plan for the device will be provided where applicable.

8 CONCLUSIONS

GWE Consulting Ltd has been engaged to provide a stormwater management design for the proposed development at 13 Church Bay Road, Waiheke Island. The design has been undertaken in accordance with relevant standards, guidelines, and planning instruments.

The following stormwater infrastructure is proposed:

1. Runoff from the new dwelling roof can be collected into the existing two concrete tanks or the proposed 25,000 L Promax rainwater tank or similar approved. The tank is to be placed next to the existing concrete tanks at the rear of the site. Refer to J3922-400 in Appendix B for the approximate locations.

2. The existing driveway area will remain untouched and therefore, will discharge via existing drainage paths.
3. Stormwater treatment devices shall consist of:
 - a. Leaf guards on roof guttering/first flush device on downpipes.
 - b. Flows from subsurface drainage shall be directed to silt traps or catchpits prior to discharge.
4. Overflow from rainwater tanks will be discharged to the land through the existing stormwater discharge pipe. It is proposed that the pipe be extended further down the property and a rip rap be placed downstream of discharge pipe to reduce the risk of scour and erosion at the discharge location.
5. All works are to be constructed as per the attached drawings, manufacturer's recommendations, specifications provided by the Engineer, or relevant industry standards.

9 LIMITATIONS

This report has been prepared for the sole benefit of **Steve Bernstein & 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
ARCHITECTURAL DRAWINGS

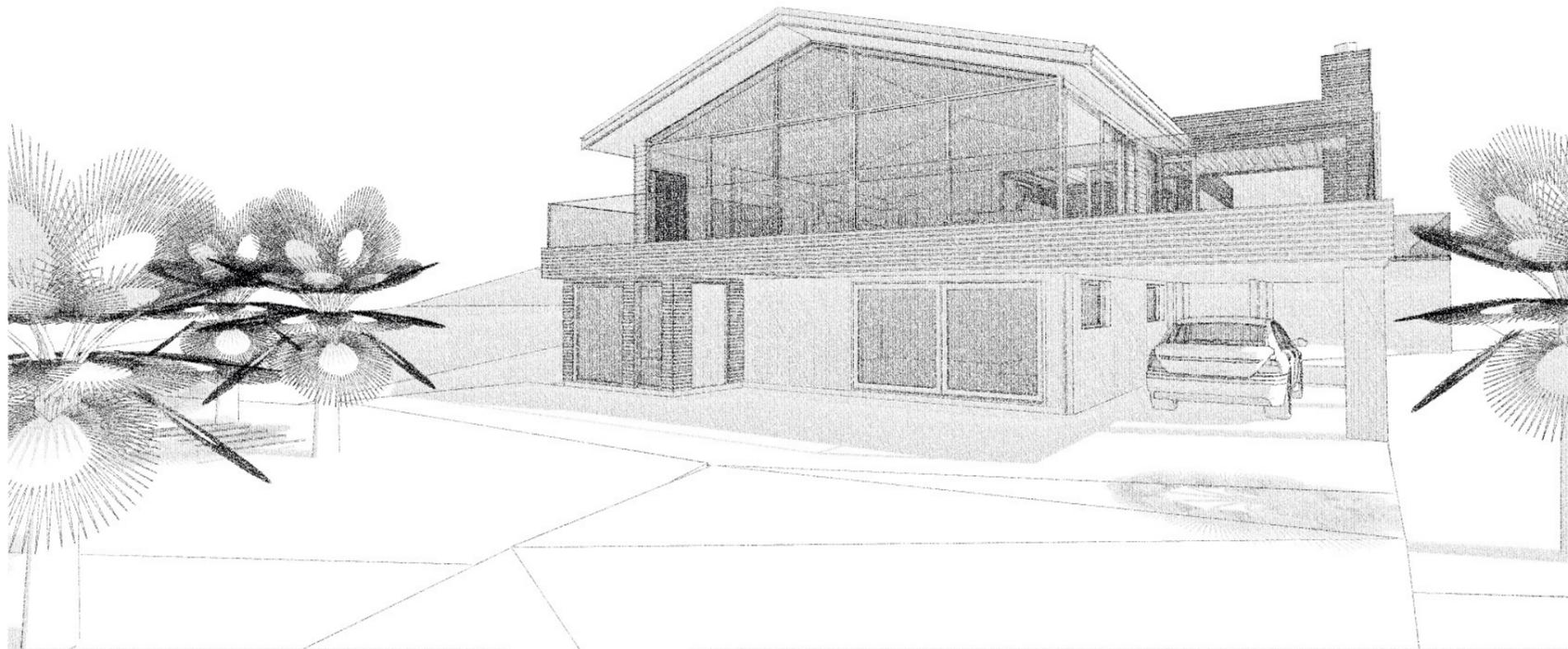


ARCHITECTURAL DRAWINGS SCHEME PLANS

DRAWING LIST

REV

Layout ID	Layout Name
	Kitchen Layout
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



LOCATION PLAN

SITE INFORMATION

Site Address: 13 Church Bay Road, Waiheke Island, Auckland 1081
Legal Description: Lot 9, DP 6807,
Site Area: 2023m²
Zone: Hauraki Gulf Islands - Island Residential 2 (Bush Residential)
Overlays: Natural Resources: High-Use Aquifer Management Areas Overlay [rp] - Waiheke Aquifer
Controls: Macroinvertebrate Community Index - Rural
 Macroinvertebrate Community Index - Urban
 Stormwater Management Area Control - MATIATIA, Flow 1
 Stormwater Management Area Control - BLACKPOOL, Flow 2
Wind Area: High Wind Zone

PLANNING NOTES:

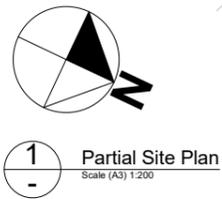
OPERATIVE DISTRICT PLAN

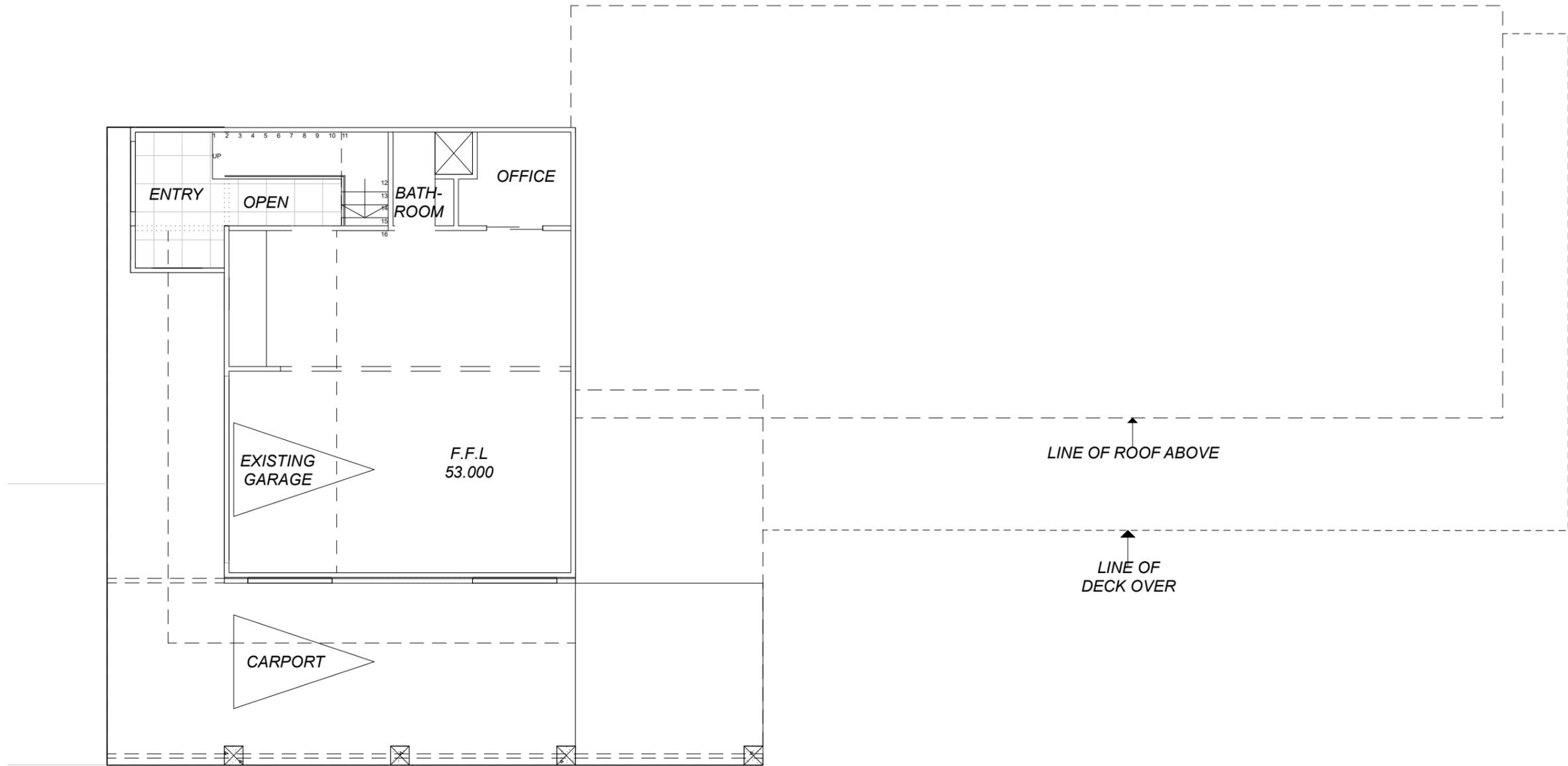
Zone Constraints:
Height:
 Maximum height 8m
Yard Setbacks:
 Front Yard 4.0m
 Rear/ Side Yard 1.5m
H.I.R.T.B:
 North 2.0m + 55°
 East 2.0m + 45°
 South 2.0m + 35°
 West 2.0m + 45°
Building Coverage:
 15% max. Site Area (2023m²) 303.45m²
Impervious Area:
 30% max. Site Area (2023m²) 606.90m²
Earthworks:
 Permitted Area 400m²

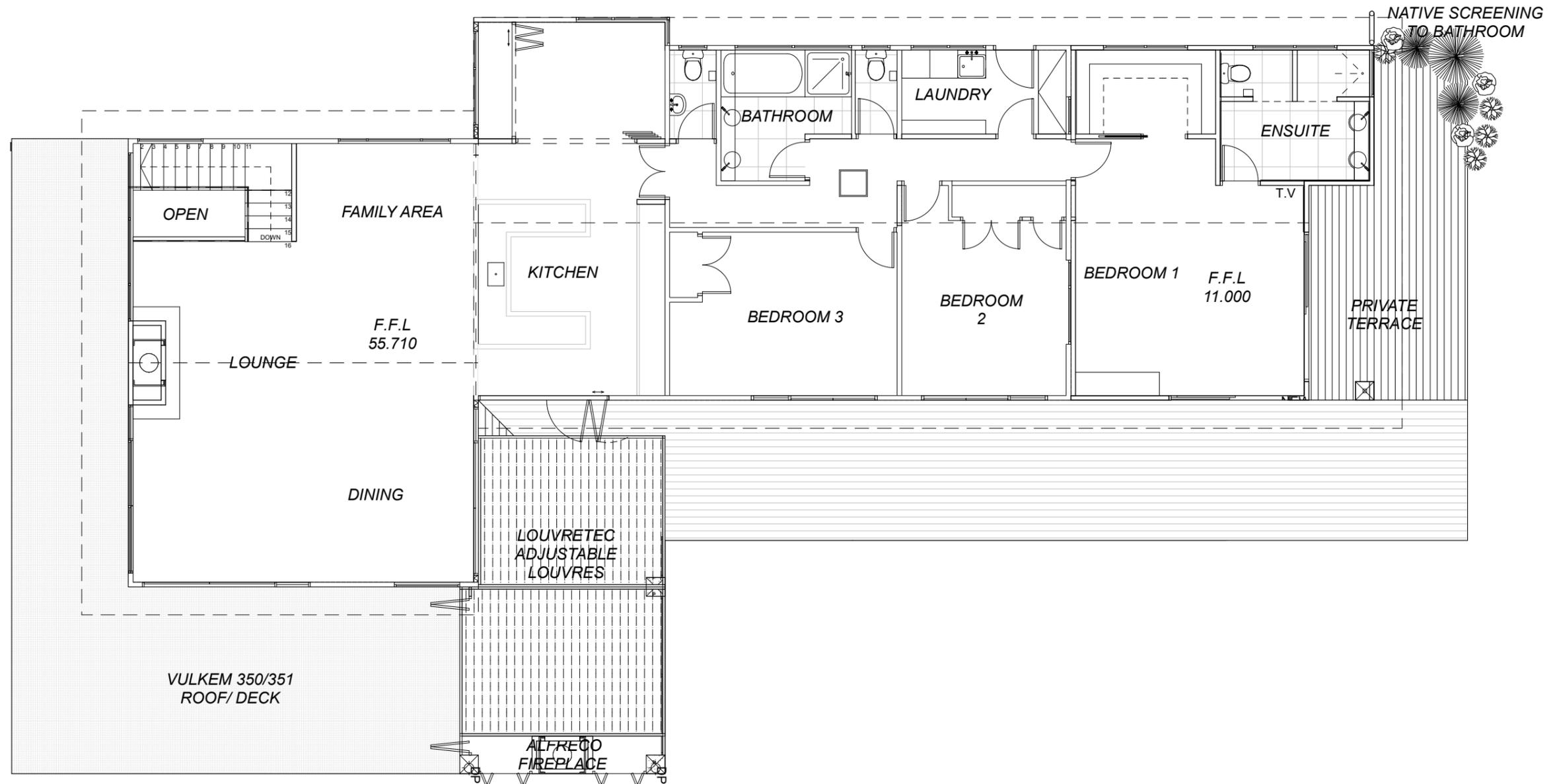
PROPOSED SCHEME

ASSESSMENT IN TERMS OF OPERATIVE PLAN

- COMPLIES
- NON-COMPLYING
 Actual Coverage: 319m² (15.77%)
- COMPLIES
 House/Roof (363) + Driveway (186) + Pool/ Spa (48)
 Total Area: 597m² (29.5%)
- COMPLIES (No Earthworks)







GENERAL NOTES:

1. DO NOT SCALE. USE DIMENSIONS ONLY.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE.
3. CONTRACTOR TO REPORT ANY APPARENT DISCREPANCY TO ARCHITECT FOR INTERPRETATION TO THE AFFECTED WORK PROCEEDING
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Job Title

Bernstein & Flamank Home Alterations

13 Church Bay Road
Church Bay, Waiheke Island

Drawn by

BRYCE ARDERN

Drawing Status

Resource Consent

Sheet

04

Scale
1:100

Date
12/10/2022

Rev. A

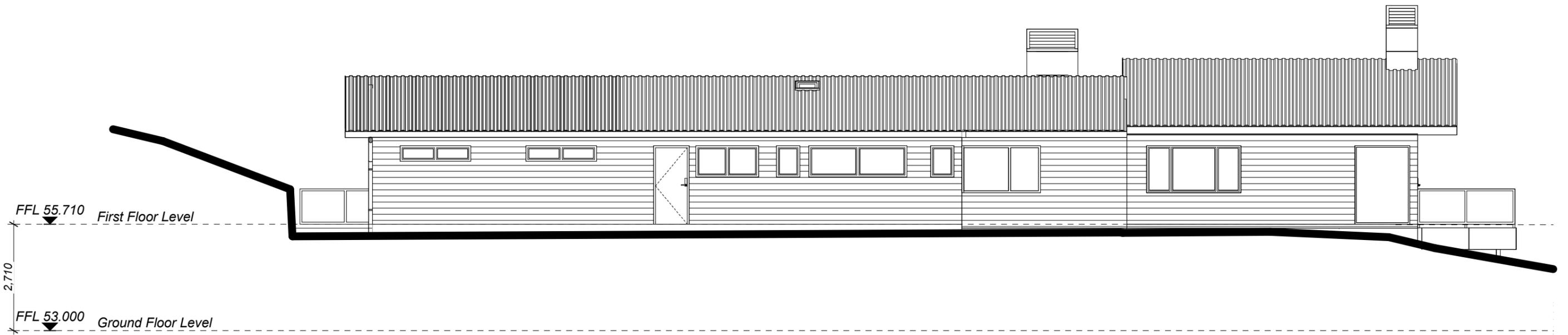
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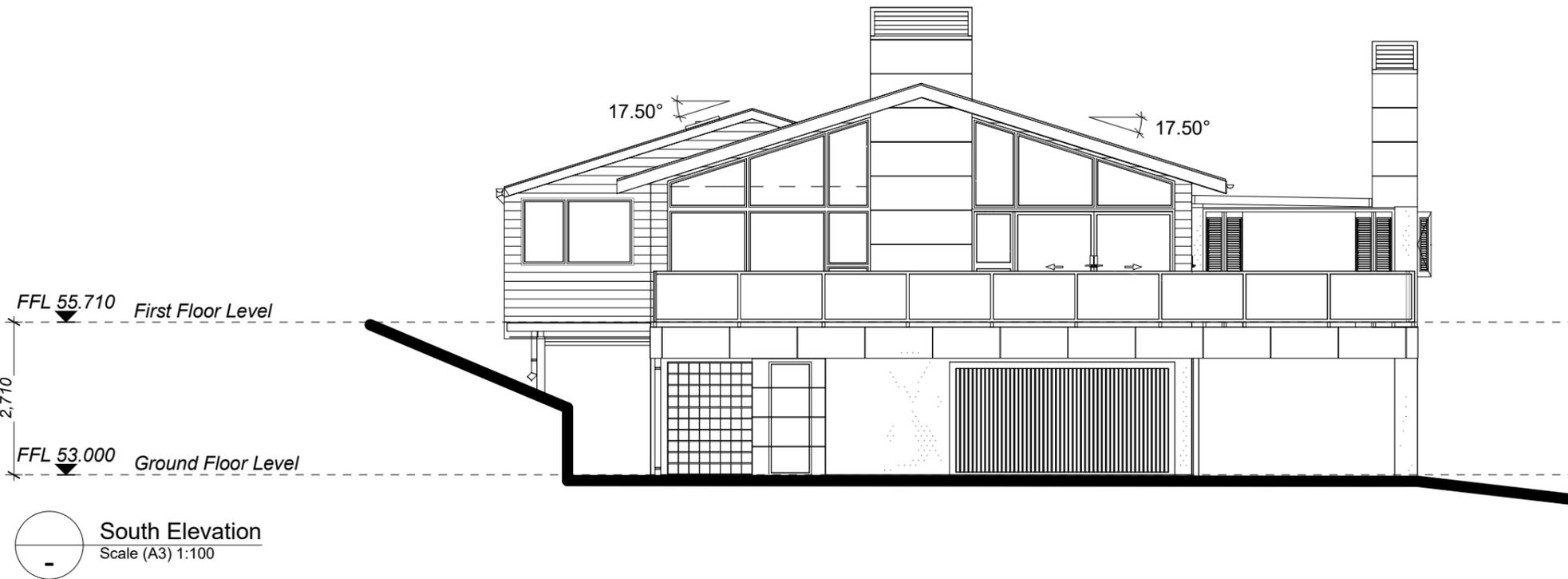
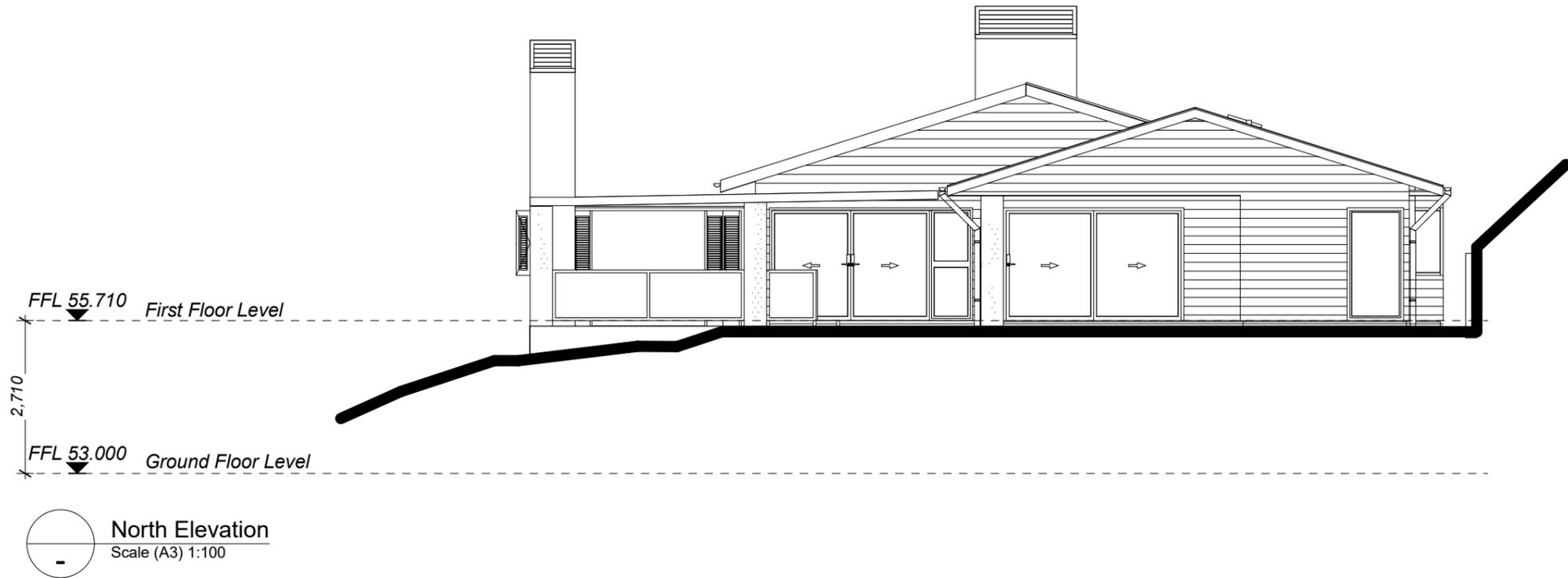
Existing First Floor Plan



East Elevation
Scale (A3) 1:100



West Elevation
Scale (A3) 1:100

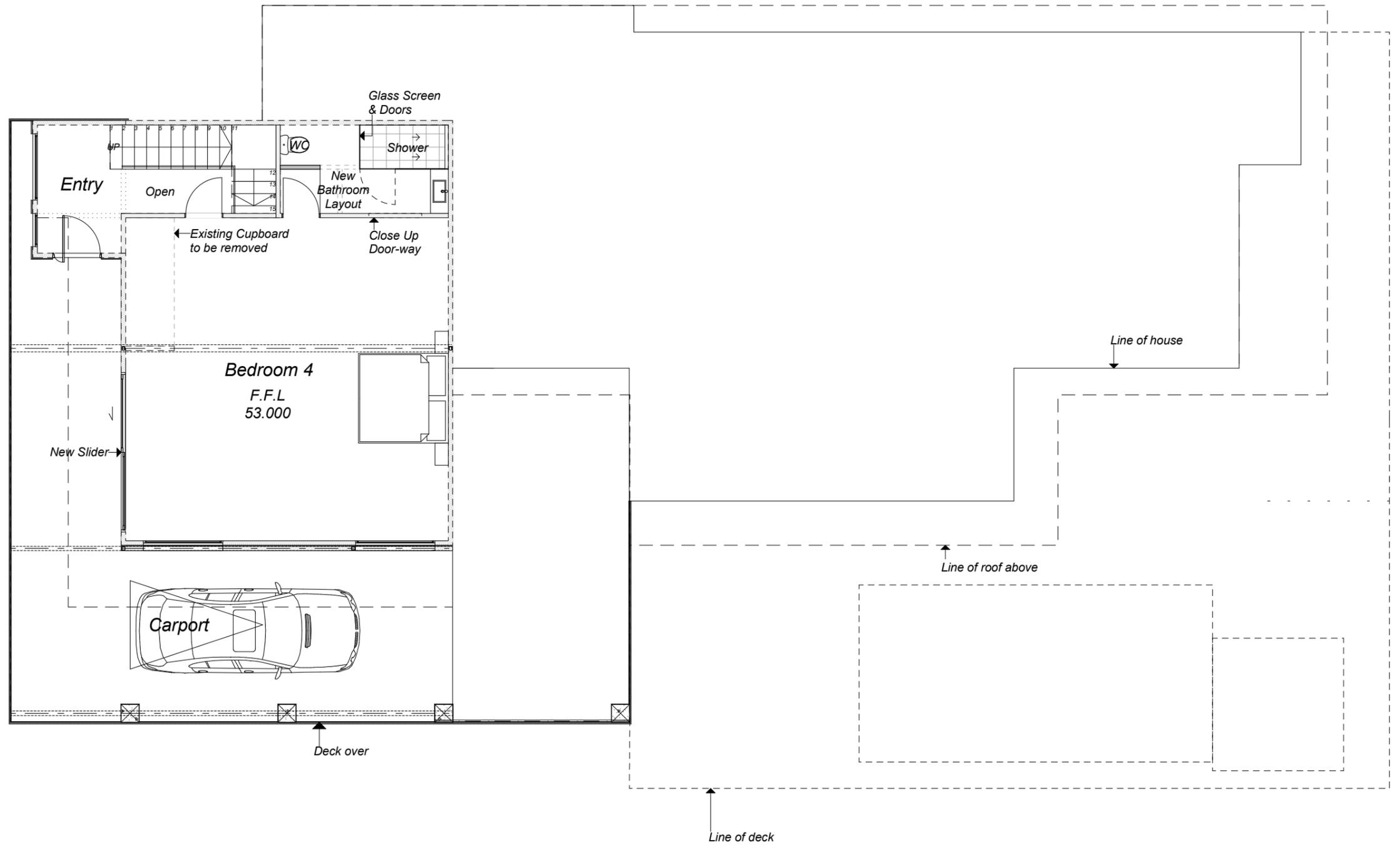


Legend

-  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

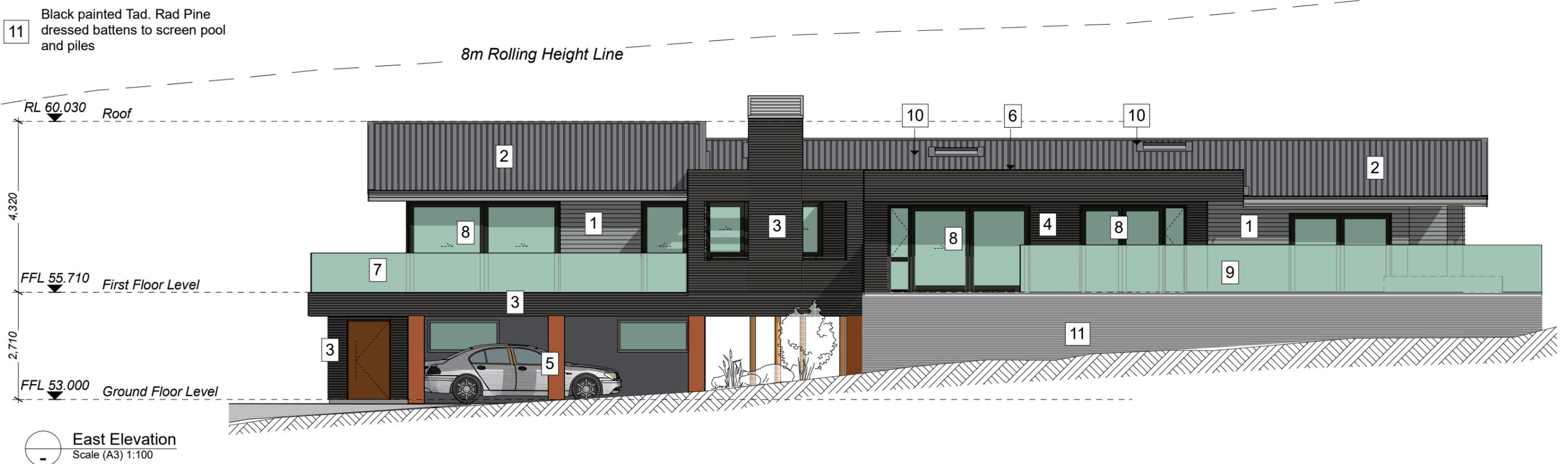
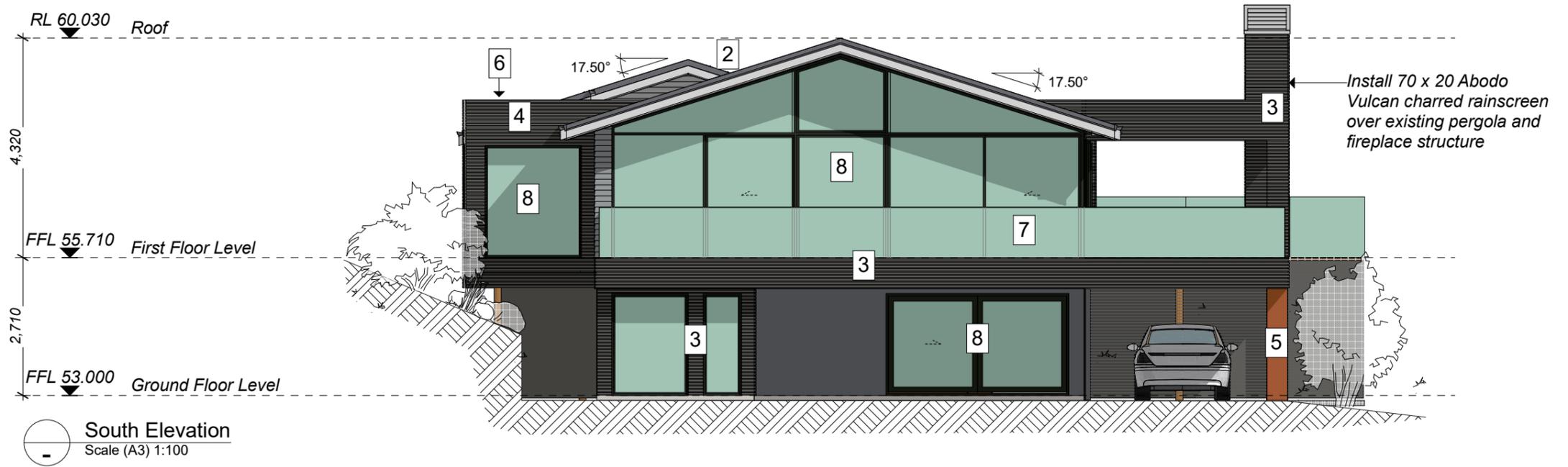


1 Ground Floor Plan
Scale (A3) 1:100



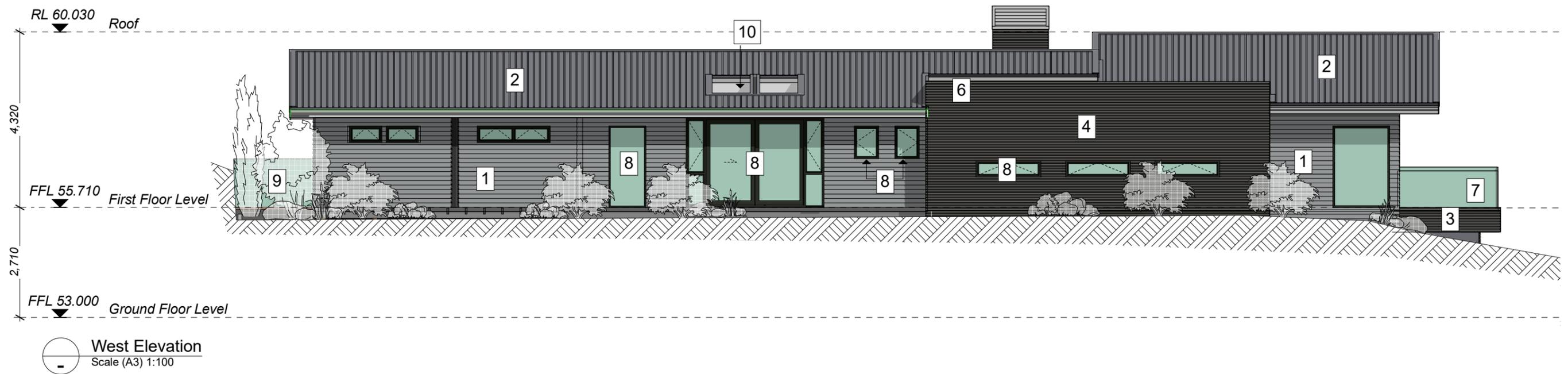
Legend

- 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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Job Title

Bernstein & Flamank Home Alterations

13 Church Bay Road
Church Bay, Waiheke Island

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Drawing Status

Resource Consent

Sheet

11

Scale
1:3.19

Date
12/10/2022

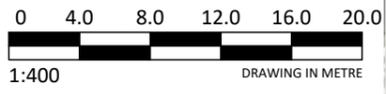
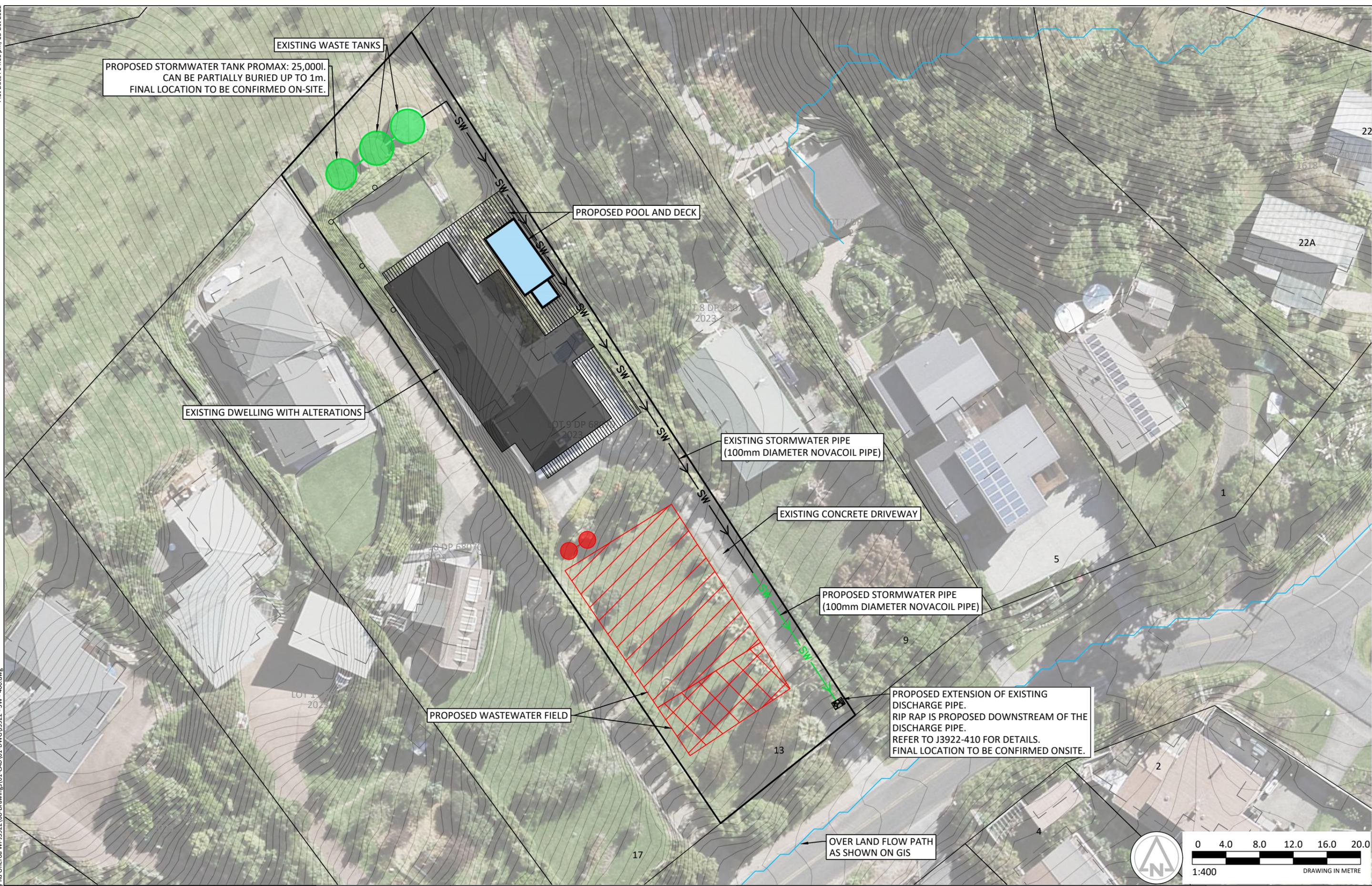
Rev. A

BRYCE ARDERN

Drawing Title

Renders

**APPENDIX B
GWE DRAWINGS**



0	FIRST ISSUE	MD	AT	ML	17/10/22
REV	AMENDMENT	CAD	ENG	APPD	DATE
ISSUE STATUS:		FOR CONSENT			

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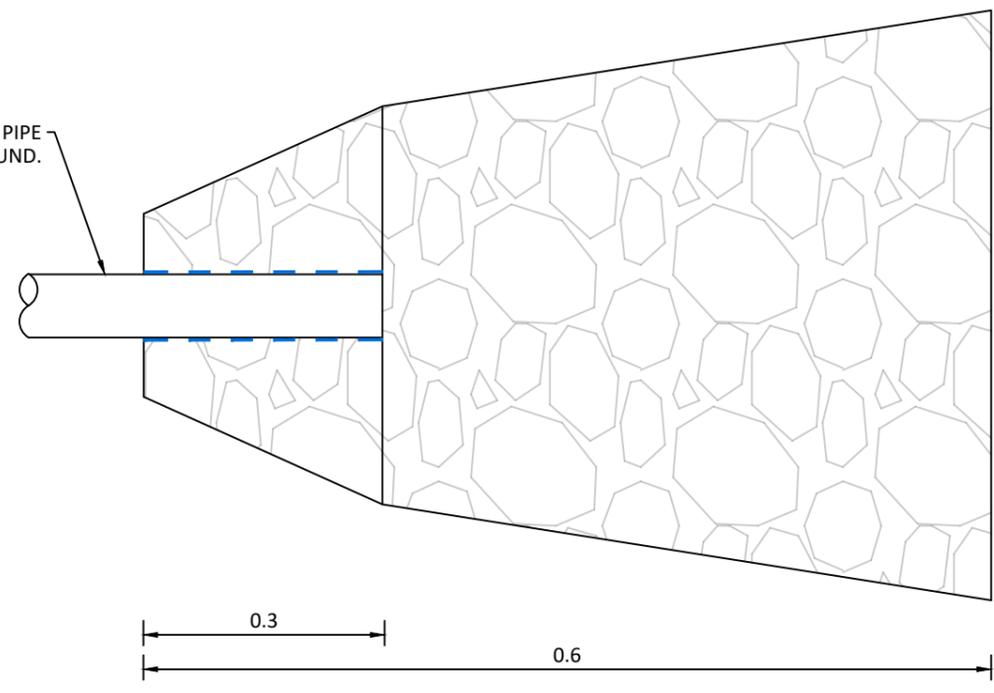
GWE CONSULTING LIMITED
G FLOOR OCEANBRIDGE HOUSE
25 ANZAC STREET TAKAPUNA
AUCKLAND 0622
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www.gwe.co.nz

PROJECT ADDRESS:	13 CHURCH BAY ROAD, ONEROA, WAIHEKE ISLAND
CLIENT:	STEVE BERNSTEIN & KEITH FLAMANK
DRAWING TITLE:	STORMWATER SITE PLAN

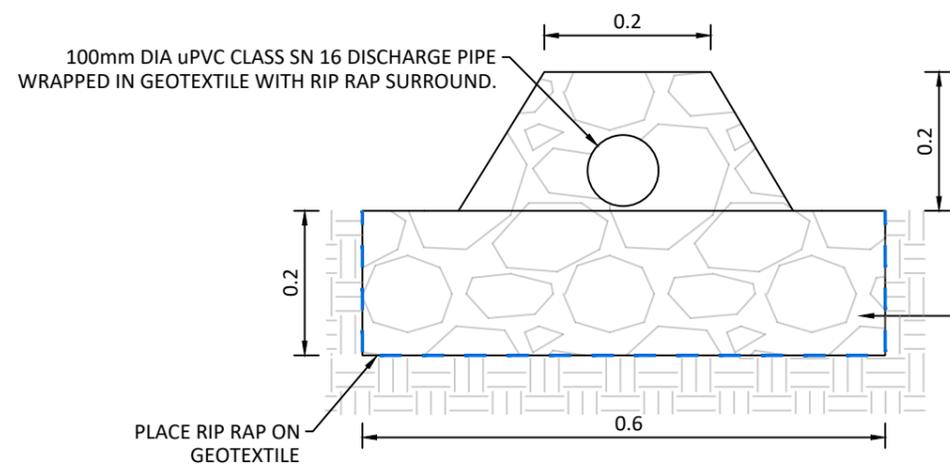
PROJECT No :	J3922
DRAWING No :	400
REV	0
SCALE:	1:400 @ A3

- DETAIL NOTES:**
1. INSTALL AS PER MANUFACTURES RECOMMENDATIONS AND TO MEET NZBC E1 UNLESS SPECIFIED OTHERWISE.
 2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT NEW ZEALAND STANDARD, RELEVANT SECTIONS OF THE NEW ZEALAND BUILDING CODE (IN PARTICULAR NZBC E1 ACCEPTABLE SOLUTIONS) UNLESS SPECIFIED OTHERWISE.
 3. PRIOR TO COMMENCING WORK THE CONTRACTOR IS TO IDENTIFY ALL EXISTING SERVICES ONSITE AND CONFIRM LAYOUT AND LEVELS.
 4. DO NOT SCALE FROM THIS DRAWING

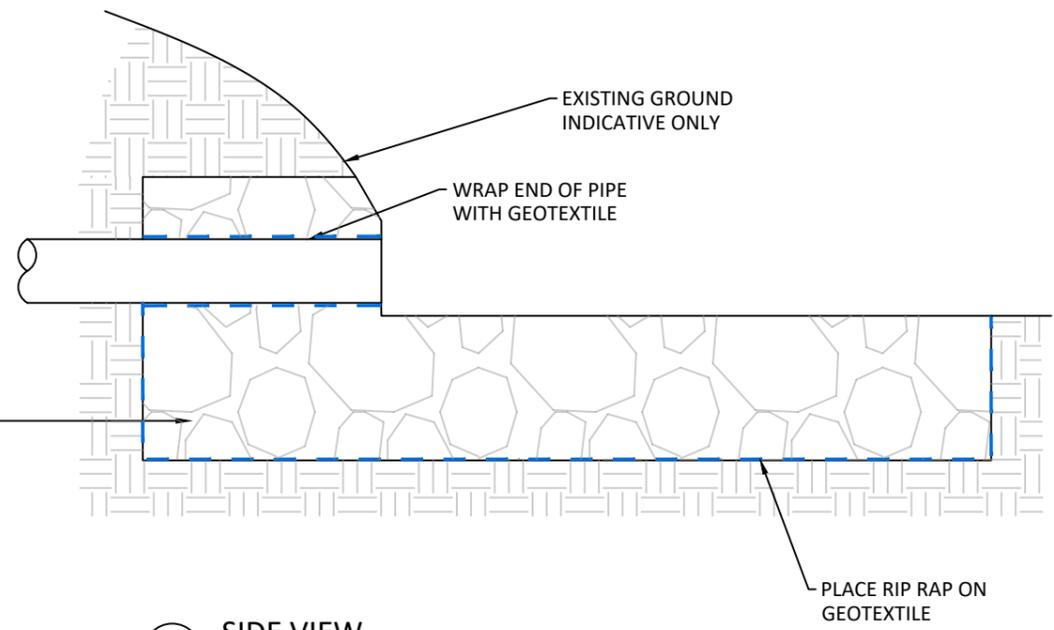
100mm DIA uPVC CLASS SN 16 DISCHARGE PIPE WRAPPED IN GEOTEXTILE WITH RIP RAP SURROUND.



1 PLAN VIEW Scale: NTS



2 SECTION VIEW Scale: NTS



3 SIDE VIEW Scale: NTS

0	FIRST ISSUE	MD	AT	ML	17/10/22
REV	AMENDMENT	CAD	ENG	APPD	DATE
ISSUE STATUS:		FOR ISSUE			

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PROJECT ADDRESS:	13 CHURCH BAY ROAD, ONEROA, WAIHEKE ISLAND	PROJECT No :	J3922
CLIENT:	STEVE BERNSTEIN & KEITH FLAMANK	DRAWING No :	420
DRAWING TITLE:	RIP RAP	REV	0
		SCALE:	NOT TO SCALE