

PRODUCER STATEMENT – PS1
DESIGN



association
of
consulting
and
engineering



Building Code Clause(s):	B1,	Job number: 2630-1
ISSUED BY: <i>(Engineering Design Firm)</i>	Manktelow Consulting Engineers	
TO: <i>(Client)</i>	Graeme Brown	
TO BE SUPPLIED TO: <i>(Building Consent Authority)</i>	Opotiki District Council	
IN RESPECT OF: <i>(Description of building work))</i>	New build	
AT: <i>(Address)</i>	116 Richard Street, Opotiki, Opotiki	
LEGAL DESCRIPTION	Lot 2, DPS 3037	

We have been engaged by Graeme Brown to provide:

SED Foundations,

in respect of the requirements of the Clause(s) of the Building Code specified above for part only, as specified in the attached Schedule, of the proposed building work.

In this document SED means “Specific Engineering Design”.

The design carried out by Manktelow Consulting Engineers has been prepared in accordance with:

- ✓ compliance documents issued by the Ministry of Business, Innovation & Employment (Verification method /acceptable solution): VM1/VM4

The proposed building work covered by this producer statement is described in the drawings specified in the attached Schedule, together with the specification, and other documents set out in the attached Schedule.

On behalf of Manktelow Consulting Engineers, and subject to:

- site verification of the following design assumptions:
 - Construction is as detailed on attached sketch markups and outline specifications
- all proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that:

- the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached Schedule, will comply with the relevant provisions of the Building Code specified above; and that
- the persons who have undertaken the design have the necessary competence to do so.

I recommend the Nil level of construction monitoring.

I, Craig Manktelow, am:

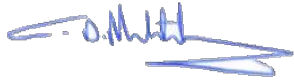
- CPEng number 131529
- and hold the following qualifications: BE(Hons) CPEng CMEngNZ IntPE/APEC Engineer

Manktelow Consulting Engineers holds a current policy of Professional Indemnity Insurance no less than \$200,000.

✓ Manktelow Consulting Engineers is a member of ACE New Zealand.

SIGNED BY: Craig Manktelow

(Signature):



Date: 27 November 2024

ON BEHALF OF: Manktelow Consulting Engineers

Note: This statement has been prepared solely for Opotiki District Council and shall not be relied upon by any other person or entity. Any liability in relation to this statement accrues to Manktelow Consulting Engineers only. As a condition of reliance on this statement, Opotiki District Council accepts that the total maximum amount of liability of any kind arising from this statement and all other statements provided to Opotiki District Council in relation to this building work, whether in tort or otherwise, is limited to the sum of \$200,000.

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

SCHEDULE TO PS1

Please include an itemised list of all referenced documents, drawings, or other supporting materials in relation to this producer statement below:

- Certificate of Design Work, Construction Monitoring Schedule, Design Features Report, Structural Maintenance Schedule, B2 Letter in Lieu - Design
- Engineering Calculations: MCE calculations, attached.
- Geotechnical Report: MCE authored, GEOTECHNICAL REPORT – BUILDING FOUNDATION SOILS, 116 Richard Street, OPOTIKI, project ref. 2630-1 dated 20 September 2024.
- J.T Architectural Drafting Services drawings titled House Re-siting at 116 Richard Street, dated Oct 2024.

Limited Scope of Engagement

We have been engaged by Graeme Brown to provide services in respect of the requirements of the Clause(s) of the Building Code specified above for the following parts of the proposed building work:

SED Foundations including subfloor bracing

GUIDANCE ON USE OF PRODUCER STATEMENTS

Information on the use of Producer Statements and Construction Monitoring Guidelines can be found on either the [ACE New Zealand](#) or [Engineering New Zealand](#) websites.

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects (NZIA), Institution of Professional Engineers New Zealand (now Engineering New Zealand), Association of Consulting and Engineering New Zealand (ACE NZ) in consultation with the Building Officials Institute of New Zealand (BOINZ). The original suite of producer statements has been revised at the date of this form to ensure standard use within the industry.

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

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

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

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

PS4 CONSTRUCTION REVIEW: Intended for use by a suitably qualified independent engineering construction monitoring professional who either undertakes or supervises construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

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

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

Competence of Engineering Professional

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

The person signing the Producer Statement on behalf of the engineering firm will have a professional qualification and proven current competence through registration on a national competence-based register such as a Chartered Professional Engineer (CPEng).

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

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

Professional Indemnity Insurance

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

The PI Insurance minimum stated on the front of this form reflects standard practice for the relationship between the BCA and the engineering firm.

Professional Services during Construction Phase

There are several levels of service that an engineering firm may provide during the construction phase of a project (CM1-CM5 for engineers3).

The BCA is encouraged to require that the service to be provided by the engineering firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

BCAs should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued. No design professional should be expected to provide a producer statement unless such a requirement forms part of Manktelow Consulting Engineers's engagement.

Refer Also:

- 1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013
- 2 NZIA Standard Conditions of Contract SCC 2011
- 3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/Engineering New Zealand 2004)
- 4 PN01 Guidelines on Producer Statements

www.acenz.org.nz

www.engineeringnz.org

SCHEDULE OF MONITORING FOR

Address: 116 Richard Street, Opotiki, Opotiki

Job number: 2630-1

We propose that at least the following site monitoring is undertaken to Engineering New Zealand/ACENZ Nil:

No.	Item of monitoring	Timeframe	To be monitored by
1.	Augered concrete piles and subfloor fixings and piles	pre-pour and whilst still visible and able to be amended	Building Consent Officer
2.	External posts and connection	While all connections are clearly visible, pre-line and prior to building in to such an extent that remediation work could not be carried out.	Building Consent Officer
3.	subfloor fixings and connections	While all connections are clearly visible, pre-line and prior to building in to such an extent that remediation work could not be carried out.	Building Consent Officer

Notes:

- The above are the minimum inspections required for the attached engineering drawings and design. Given the small nature of this project Chartered Engineer inspection is not required. It is assumed that the Territorial Authority will complete the normal inspections as part of this consent. Manktelow Consulting Engineers should be contacted with any variations so an alternate design can be provided.*
- The above items of monitoring do not cover work constructed in accordance with NZS 3604:2011, for which monitoring is to be undertaken by the Building Consent Authority.
- The District Council will conduct inspections to verify construction compliance as detailed and approved. See the attached inspection schedule. Given the project's small scale, a PS4-Construction Review is not expected. However, if the Council requires it, MCE will need to complete the inspections. Please notify MCE if this is required so the inspections can be scheduled.*
- A copy of this monitoring schedule is to be held on site during the works, and the Contractor/Builder is to provide reasonable and safe access to enable works to be monitored according to the schedule.
- The above schedule does not necessarily represent the actual number of monitorings to be undertaken. The number of monitorings will depend on the construction method, sequence of the works and whether or not unforeseen conditions or difficulties are encountered on site.



CERTIFICATE OF DESIGN WORK MEMORANDUM FROM LICENSED BUILDING PRACTITIONER

SECTION 30C AND SECTION 45, BUILDING ACT 2004

THE BUILDING

Street Address	116 Richard Street		
Suburb	Opotiki	Town/City	Opotiki
Postcode			

THE OWNER

Name(s)	Graeme Brown		
Email	graham.brown107@gmail.com	Phone	0278056805
Address	116 Richard Street, Opotiki, Opotiki		

BASIS FOR PROVIDING THIS MEMORANDUM

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

IDENTIFICATION OF RESTRICTED BUILDING WORK (RBW) DESIGN WORK

I, Craig Manktelow carried out or supervised the following RBW design work:

PRIMARY STRUCTURE: B1

Design work that is RBW		Description (as required) and reference to plans and specifications	Carried out or supervised
Foundations	✓	House footings including subfloor bracing. Refer engineering drawings.	Carried out
Subfloor framing	✗	Not applicable	Not applicable
Retaining walls	✗	Not applicable	Not applicable
Beams	✗	Not applicable	Not applicable
Portal	✗	Not applicable	Not applicable

Job Number: 2630-1

Job Address: 116 Richard Street, Opotiki, Opotiki

Compilation Date and Time: 26 November 2024 at 16:28 pm

PS1 - DESIGN – JANUARY 2024 (REV 01)

PAGE 6 OF 11

Bracing	☒	Not applicable	Not applicable
Other (primary)	☒	Not applicable	Not applicable

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

WAIVERS AND MODIFICATIONS

Are waivers or modifications of the Building Code required? No

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

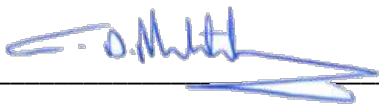
ISSUED BY

Name	Craig Manktelow	Design entity/company	Manktelow Consulting Engineers
Chartered status	Chartered Professional Engineer	Chartered no.	131529
Email	craig@mcel.co.nz	Website	www.mcel.co.nz
Phone (daytime)	073072002	Phone (after hours)	0276125548
Mobile	0276125548		
Postal address	P.O. Box 474, Whakatane		
Physical address	1st Floor, 240 The Strand, Whakatane		

DECLARATION

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

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

Signature

Date27 November 2024

NEW BUILD AT 116 RICHARD STREET, OPOTIKI, OPOTIKI

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

Inspection/maintenance timeframe and item	
(a) Half-yearly	Wash down all exposed steelwork that is not in a fully interior environment including: Exposed timber fixings (e.g. bolts and brackets).
(b) 5 yearly	Not applicable.
(c) 10 yearly	- Check exposed timber fixings for corrosion, repair as required. - Inspect/replace sealant that encloses structural mild-steel components and/or timber with mild-steel fixings. This will typically include sealants around the perimeter of precast panels. Note that 10 years is the expected useful life for many sealants
(d) 25 yearly	Inspect all exposed, external timber. Repair as required.
(e) Following fit-out or alterations	Not applicable.
(f) Following seismic shaking > SLS1 event	Inspections and repair as per sections above

These calculations pertain to New build at 116 Richard Street, Opotiki, Opotiki and cover the following design aspects:

- Foundations - House footings including subfloor bracing. Refer engineering markups and outline specification to be added by architect to drawings
- MCE authored, GEOTECHNICAL REPORT – BUILDING FOUNDATION SOILS, 116 Richard Street, OPOTIKI, project ref. 2630-1 dated 20 September 2024.
- Bracing – a mixture of NZS3604:2011 and SED elements as shown in bracing plan

STANDARDS REFERENCED

- AS/NZS 1170 Structural design actions, NZS 3604:2011 Timber-framed buildings, NZS 3605:2001 Timber piles and poles for use in building, NZS AS 1720.1 Timber structures Part 1: Design methods

BUILDING IMPORTANCE LEVEL: IL2

WIND LOADS

Wind zone = Medium - 37m/s

PERMANENT ACTIONS (DEAD LOADS) AND LIVE LOADS

DEAD LOADS

	Description	Unit load
Roof	Decromastic tiles, trusses @18degree, gib ceiling	0.40kPa
Floor	plywood/partbd floor incl partitions	0.5 kPa
Floor	Deck, ltf	0.35 kPa
External Walls	light timber interior and gib linings	0.3kPa

LIVE LOADS (REFER TABLE 3.1 & 3.2 PART 1 AS/NZS 1170)

	Distributed load	Point load
Floor	1.5kPa	1.8kN
Deck	2.0kPa	1.8kN

*Denotes reductions allowable in specific cases

DUCTILITY AND DEFLECTION

Refer attached. NZS 3604 u= 3.5 and SED u=2.0

Job Number: 2630-1

Job Address: 116 Richard Street, Opotiki, Opotiki

Compilation Date and Time: 26 November 2024 at 16:28 pm

PS1 - DESIGN – JANUARY 2024 (REV 01)

PAGE 9 OF 11

SOIL CLASS AND SEISMIC COEFFICIENT

SED bracing elements			
Soil class =	D	Z =	0.3
S _p =	0.70	T ₁ =	<0.4s
μ =	2	C _d (T ₁) =	0.401

SOIL PARAMETERS

Ultimate Bearing Strength = q_u	189kPa at 0.9m
Ultimate Bearing Strength Reduction Factor	0.45
Soil Shear Strength = q_u	17
Soil Shear Strength Reduction Factor	0.45
Source of Parameters	none specified pile capacity calculated per geotech report

Soil Type	ϕ (degrees)	Density (kN/m3)
-----------	-------------	-----------------

LIQUEFACTION RISK: Low (Source: Geotechnical Report)

EXPANSIVE SOILS SUSPECTED: No (Source: Geotechnical Report)

FOUNDATIONS

Existing subgrade material tested by MCE refer attached.

CORROSION

STEEL FIXINGS FOR EXPOSURE ZONES TO NZS 3604:2011 TABLE 4.1

	Location	Description	Treatment
Zone D	All structural fixings	Sheltered and Exposed	Type 304 Stainless Steel



To the Building Official,
Opotiki District Council
New build at 116 Richard Street, Opotiki, Opotiki

COMPLIANCE WITH BUILDING CODE CLAUSE B2 – DURABILITY

The purpose of this letter is to demonstrate how compliance with Clause B2 (Durability) of the Building Code will be achieved for the above project. We can confirm that for specifically designed structural elements that are included within our design documentation:

Material	Means of Compliance	Details
Structural timber	B2/AS1	Timber treatment has been selected in accordance with Table 1A of B2/AS1
Mild steel structure	B2/AS1	Corrosion rates used per SCNZ and NZS 3404- surface protection as described. Mitek and Bowmac brackets per onsite guide

Yours faithfully,

27 November 2024

Craig Manktelow
For and on behalf of
Manktelow Consulting Engineers

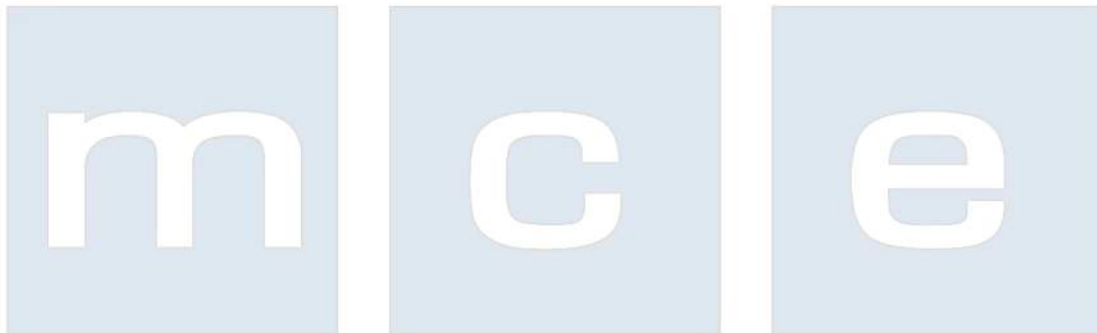
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025

STRUCTURAL ENGINEERING MARK-UPS AND OUTLINE SPECIFICATION

Contents

1. General.....	2
2. Structural Timber.....	4

Attached: Proprietary Product Information Sheets



Proposed Residence
116 Richard Street
Opotiki

Project ref: 2630-1
11 November 2024

1.0 General

- 1.1 This specification applies only to parts of the proposed project in regard to the specifically designed roof foundations as sized in Manktelow Consulting Engineers producer statement PS1 and design features report and outlines some of the assumptions pertaining to the remaining structure.
- 1.2 During construction the structure shall be maintained in a stable state by means of temporary bracing such that no part is overstressed or will collapse.
- 1.3 Check all the dimensions and levels on site before fabrication. Locate and protect all existing services before excavation and pile installation. All footing excavations shall be clear of debris and groundwater before any concrete pour.

Concrete shall not be fully loaded with house dead load until it has cured for at least 24 hours.

- 1.4 Proprietary systems and products shall be installed strictly in accordance with manufacturers' recommendations. This includes Bowmac and Lumberlok per MiTek *Structural Fixings On-Site Guide for Building Code Compliance* and Pryda Builders *Guide*.
- 1.5 Read in conjunction with the building consented architectural drawings and specifications by J.T. Architectural Drafting Services. Architect to transfer information contained in these markups and outline specification onto building consent drawings. It is assumed that the Territorial Authority, being the building control authority, will undertake the necessary inspections to confirm that construction is as detailed installed in accordance with the detailing on the architectural drawings and elements not covered by our review are installed in accordance with *Timber Framed Buildings Standard NZS 3604:2011*. Any variation should be reported to the designer for a design review and alternative detailing.
- 1.6 Specific Health and Safety measures and requirements are excluded from the scope of this specification. It is assumed that the building contractor will control the site and implement the appropriate protection and systems to safely manage the site.

It is assumed however that the building contractor will:

- be responsible for ensuring that the site managed to the requirements of the *Health and Safety in Employment Act 1992* and complies with all relevant New Zealand safety legislation; and
- Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment; and
- Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards; and
- Identify any significant hazards; and
- Maintain proper procedures for dealing with any emergencies or eliminating or isolating hazards that may occur; and
- Contact the designer if there are Health and Safety concerns regarding implementation of the supplied design. Manktelow Consulting Engineers Ltd (MCEL) have attempted to provide a practical design solution. If the contractor has any Health and Safety concerns in regard to implementing the supplied design contact MCEL (073072002) prior to commencement of the task to discuss these concerns as it may be necessary to amend the design solution.

1.7 Construction tolerances :

All work to be level, plumb, and true to line and face. Unless otherwise specified in the other work sections of this specification, tolerances for structural work shall comply with the following:

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404 :1997 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

2.0 Timber

- 2.1 Structural timber elements subject to specific design and specification shall be SG8 Pinus Radiata, treated to at least NZS 3602 and NZS 3604:2011 requirements, and installed with moisture content no greater than 18%, unless a lesser moisture content is detailed in the architectural specification.
- 2.2 Light timber framed construction shall be in accordance with the latest amendment of NZS 3604:2011 unless specified otherwise in the engineering design.
- 2.3 Construction tolerances are as follows.

Table 2.1 – Timber framing tolerances

Item	Tolerances
Deviation from the position shown on plan for a building	15 mm
Deviation from vertical	15 mm per 2 storey height (5 mm per 2.4 m)
Deviation from vertical for buildings in excess of 2 full storeys	20 mm
Relative displacement between loadbearing walls in adjacent storeys intended to be in vertical alignment	5 mm
Deviation from line in plan: (a) In any length up to 10 m (b) In any length over 10 m	5 mm 10 mm total
Deviation from horizontal: (a) In any length up to 10 m (b) In any length over 10 m	5 mm 10 mm total
Straightness of corners (where 2 walls meet at right angles) Other studs (gradual bow)	2 mm in 2.4 m in both studs 6 mm in 2.4 m
Wall framing: (a) At mid-height under 3 m long horizontal straight edge (b) At mid-height under 1.3 m long horizontal straight edge	6 mm gradual bow 1.5 mm out of line

- 2.4 Corrosion protection for steel components shall be as required by the proprietary system manufacturer and NZS 3604:2011 for the appropriate corrosion zone.
- 2.5 6kN pile fixings shall be fixed at each cantilever pile location. Ordinary pile fixing per attached at each pile. See attached.
- Only join bearer directly over a pile. See attached bearer joint bearer.
- 2.6 Any timber cut faces shall be treated with Soudal NZ Metalex timber preservative.

M

N

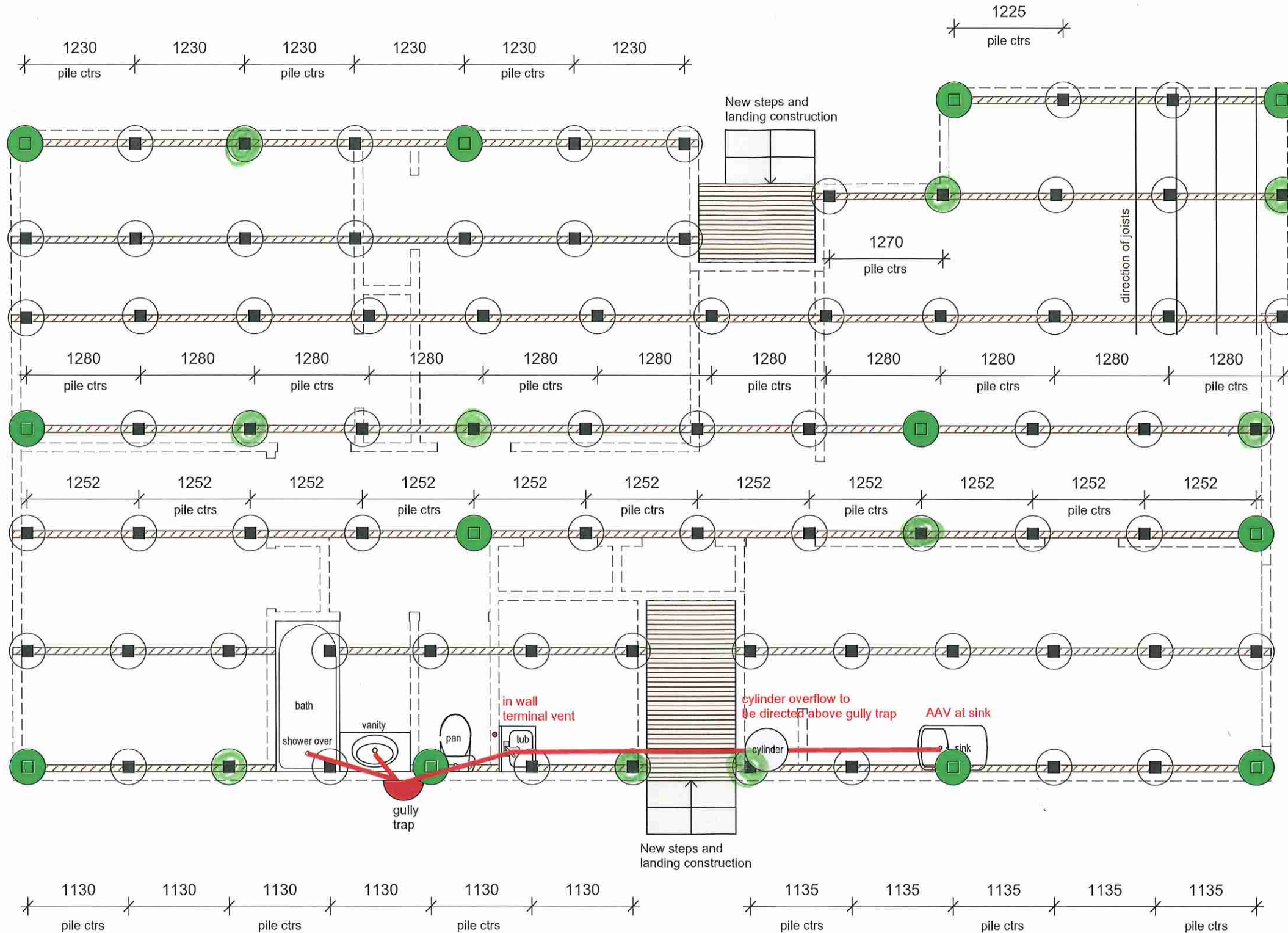
O

P

A

B

C



FLOOR JOIST NOTES

This floor joist setout plan is provided for setout purposes only. engineers documentation to take precedence over all information provided in on this sheet. if there is any discrepancies in plans from engineers documentation contact the designer before proceeding.

DIAGONAL TIMBER BRACE TO PERIMETER

Diagonal Brace: Less than 3.0m = 100mm x 75mm exceeding 3.0m = 2/100 x 50 H3.2 members. Top brace shall be connected to braced piles with M12/M16 bolts and 50 x 50 x 3mm washers. The upper end of the brace bolts shall be fixed to the bearer or joist within 200mm from C/L of pile, the lower end of brace bolt shall be fixed within 200-300mm max from cleared ground level. Refer to fig 6.6, 6.7, 6.8 3604:2011

EX FLOORING

20mm existing timber board flooring

EX FLOOR JOISTS

120 x 50 floor joists at 500-600 ctrs

EX BEARERS

100 x 75 bearers

NEW PILES KEY

- = Ordinary pile 125 x 125 H5 Tana piles at 1.3m ctrs Pile hole sizes 900mm deep x 400Ø
- = 12kN Connection. S steel lumberlok connection Pile hole sizes 900mm deep x 400Ø

HOUSE FOUNDATION OPTIONS
AS PER GEOTECH REPORT

Read this section in conjunction with the previous sections of this report.

In summary for a single storey light timber framed residence on a timber floor:

- A conventional shallow bearing foundation system subject to specific engineering design (SED), site parameters are specified herein, is feasible for this site. This may require releveling after a moderate earthquake.
- The raised gardens and fill should be removed from the southeastern corner of the house.
- Foundations should bear at least 0.9m below ground level. Applied bearing pressures should be less than those values specified herein.
- Subfloor bracing pile capacities should be assessed as part of the SED review.

20 MPA CONCRETE STRENGTH

PIPE SIZES AND FALL

Fixtures discharging to gully trap

Basin	32mm Ø	1:20 fall
Bath	40mm Ø	1:40 fall
Tub	40mm Ø	1:30 fall
Sink	40mm Ø	1:40 fall
Shower	40mm Ø	1:40 fall

m c e
manktelow
consulting
engineers
limited

P.O. Box 474
Whakatane
Ph./Fax 07 307-2002

J.T Architectural Drafting Services



Licensed Building Practitioner Design



LBP 116894
027 238 0597

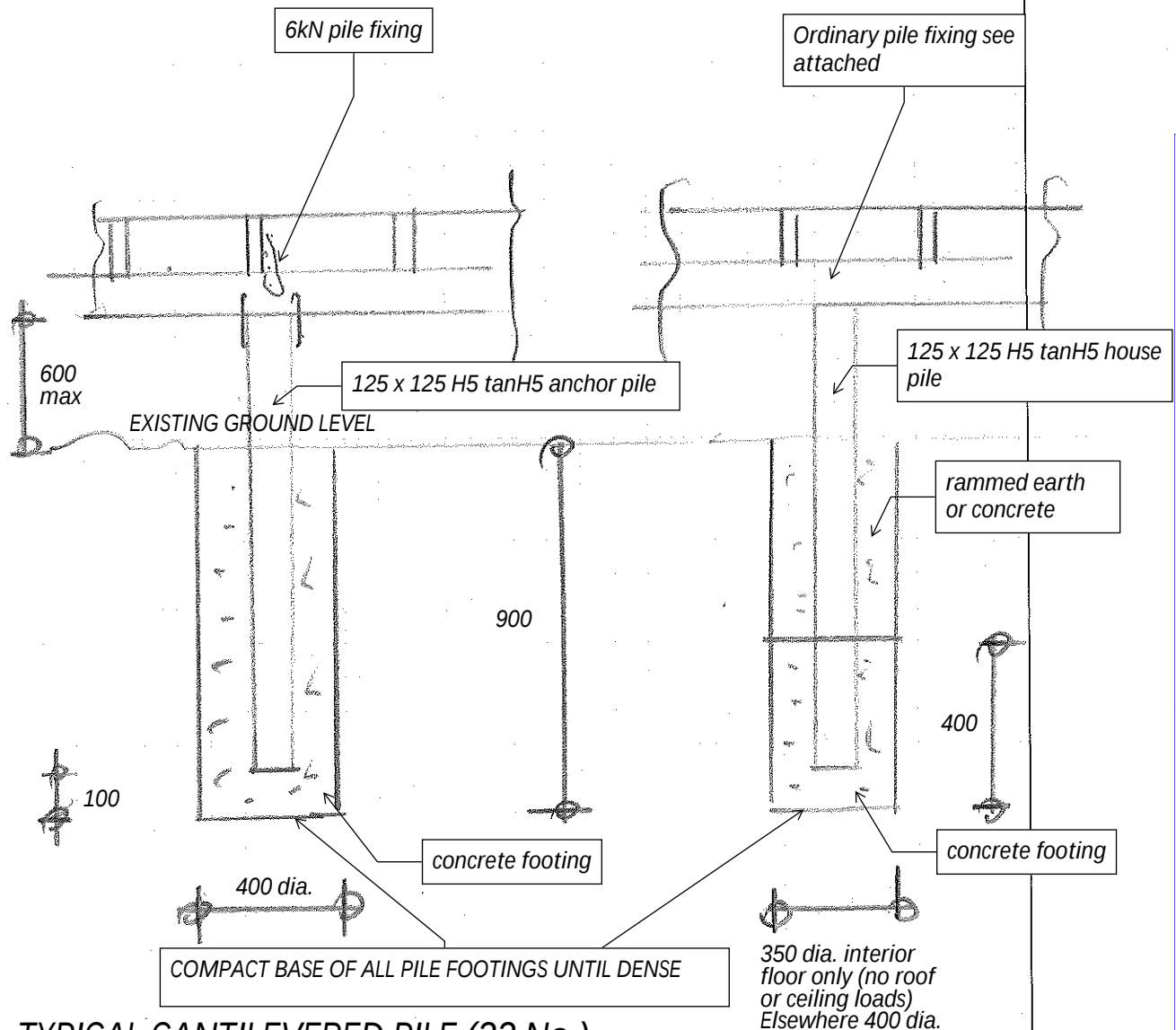
PROJECT	House Resiting at 116 Richard Street			SHEET 04
CLIENT	Graeme Brown			
DRAWING	PROPOSED FOUNDATION PLAN			REVISION
SCALE	1:50	DRAWN	JT	DATE
				OCT 2024

Brown residence
116 Richard Street
Opotiki

Project ref: 2630-1

Date:

By: CM Page: Sk2



TYPICAL CANTILEVERED PILE (22 No.)

TYPICAL ORDINARY PILE

NOTES

1. These drawings specify the MCE design requirements and encompass a portion of the project. For further details not depicted here, please refer to the architectural drawings.
2. Verify all dimensions prior to fabrication. These dimensions are derived from architectural drawings and have not been independently confirmed. Adhere strictly to the specified design element measurements. Any discrepancies with the architectural drawings should be reported to MCE for further review.
3. Dimensions in mm unless mentioned otherwise.
4. Architect to transfer sketch details and notes onto building consent drawings.



6KN PILE-BEARER KIT

Consent Doc. Ref.
P6

6kN Capacity Fixing of Cantilever Pile to Bearer and Joists

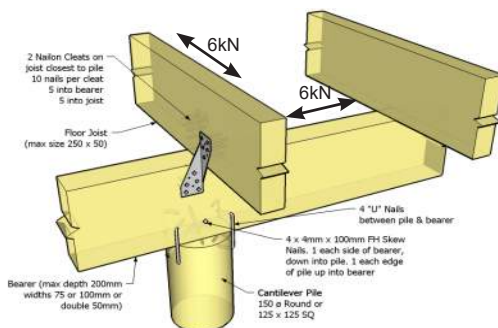
Features

- Connection detail covers bearer sizes up to 200mm deep, joists up to 250mm deep.
- All components supplied as one complete package.
- Available in all stainless steel components for use in environments with severe corrosion risk.

Installation

As detailed above but subject to the following:

1. On round pile bearer must be central. Bearer may be offset on square pile but must not overhang edge.
2. Nailon cleats fix to joist closest to pile. At building corner where fixing to boundary joist is precluded fix cleats to next closest joist along bearer.
3. At external wall where joists do not overhang bearer enough for cleats to be fixed on outside face, they may be fixed to inside face only of that bearer provided a similar detail is used on the other side of the floor system.
4. Joist must have lateral support (blocking or perimeter joist) within 300mm of bearer in accordance with NZS3604:2011 cl 7.1.2.1.
5. All components must be protected after installation against wind-blown sea salt deposition by coating with 2mm thick grease, Selseys roof and gutter (silicone) sealant, or other approved coating.



6kN Horizontal Capacity Fixing of Bearer/Joists to Cantilever Pile in accordance with NZS 3604:2011 Clauses 6.7.3.1, and 6.7.3.3.

Durability

Complies with NZ Building Code - Clause B2 for a structural component with 50 year durability.

PBK6S: Severe Corrosion Kit (All Grade 304 Stainless Steel Components) - suitable for all sea spray zone conditions.

Specifications

"U" Nails:

5mm diameter, 100mm shank and 40mm spikes (4 of)

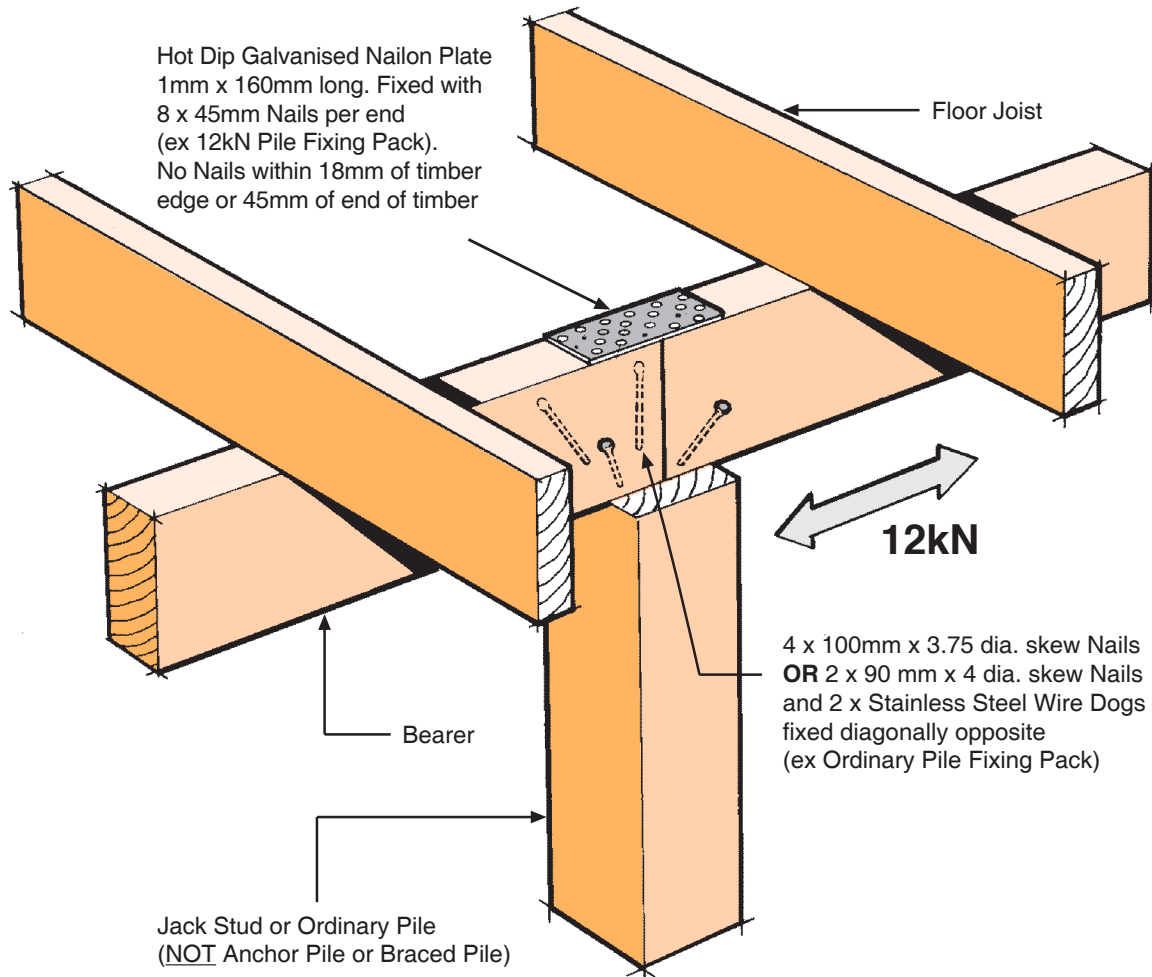
Cleats:

150 x 50 x 1mm diagonally folded (2 of same side)

Nails:

45 x 3.15 Flat Head Square Twist (22 of)
100 x 4.0 Flat Head (4 of)

12kN BEARER SPLICE OVER PILE AS PER CLAUSE 6.12.7 & FIGURE 6.19 NZS 3604:2011

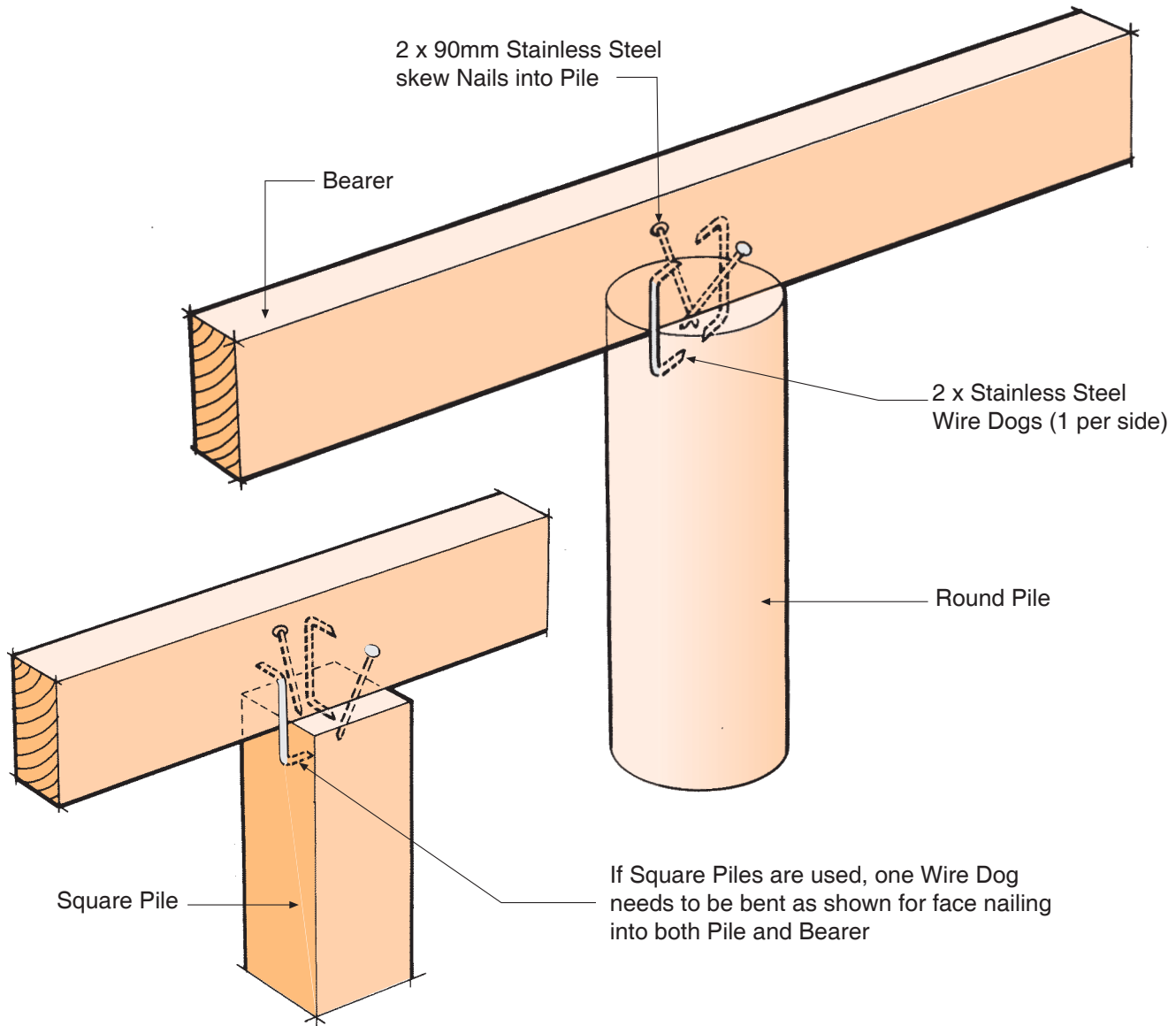


**Stainless Steel Nailon Plate and Nails to be used
in high corrosion environments**

**Available from leading Builders Supply Merchants
throughout New Zealand**

ORDINARY PILE FIXING

- Complies with NZS 3604:2011
- All Fixings Stainless Steel
- For all Ordinary Piles (Refer Figure 6.3 NZS 3604:2011)



Code: OPF
Packed: 20 x Stainless Steel Wire Dog Staples
 20 x Stainless Steel Nails 90mm x 4 dia.

**Available from leading Builders Supply Merchants
throughout New Zealand**

S&D Foundations
116 Richard Street
Opotiki

Project ref: 263-1

Date: Nov 2024

By: cm Page: 11

Scope

Specific design of foundations per MCE geotech report
Architect used NZS 3604 to specify
building structure including wall bracing

These calculations review subfloor bracing
assuming posts per NZS 3604 and assume

PDE per NZS/AS 1720:2022 check
soil reaction $u=3.0$ max for timber
structure

Check $u=1.0$ ← very conservative as
not CPE

assumed loadings per attached pg 2

Vertical safety capacity
per Geotech

$$uBC = 189 \text{ kPa} @ 0.9 \text{ m}$$

$$= 200 \text{ kPa} @ 1.2 \text{ m}$$

$$\text{Structural } uBC = 0.45 \times 189 = 85 \text{ kPa}$$

$$\text{or } 0.8 \times 189 = 151 \text{ kPa}$$

(6+2)

external
assume truss roof

at RR
combined

$$V = 1.23 \times \left(4.21 \times (0.1) + 2.10 \times (0.2) + 0.70 \times (0.5 + 1.5) \right)$$

$$= 3.29(6) + 1.80(2) = 5.19 \text{ kN}$$

$$\text{uLS} (1.26 + 1.50) V^e = 6.76 \text{ kN}$$

engineering
new zealand

Gravity

Roof	lrf roof framing, battens, plaster board ceiling, decromatic roofing @19° no access	Roof area Aroof= 17 m ²	G= 400 Pa Qb= 250 Pa or= 225.9 Pa or= 1.4 kN
External wall	lrf, weatherboard wall claddings and gib interior lining		G= 300 Pa
Floor	lrf joists, pbd flooring and partitions		G= 500 Pa Qb= 1500 Pa or= 1.8 kN
Deck	lrf joists and decking		G= 350 Pa Qb= 2000 Pa or= 1.8 kN
Wind	site wind speed Vsiteβ=VRMdm(z,cat)MsMt (m/s) Importance level 2 Design working life = 50 years	per AS/NZS 1170.2 Annual Probability of exceedance 1./25 SLS1 1./500 ULS	
	Terrain/Height Multiplier	Md= 1.0 M(z,cat)= 0.83 Ms= 1.000 Mt= 1.0 VR= 39.0 m/s VR= 45.0 m/s Vsiteβ=Vdes,θ= 32.4 m/s Vsiteβ=Vdes,θ= 37.4 m/s	any direction TC 3 z=3.5m SLS1 ULS SLS1 ULS close enough medium wind zone
	$p=(0.5p_{air})[V_{des,θ}]^2 C_{fig} C_{dyn}$	p _{air} = 1.2 kg/m ³ C _{dyn} = 1.0 p= 629 *C _{fig} Pa p= 837 *C _{fig} Pa	SLS1 ULS

Earthquake

Location: Opotiki

Shallow Soil (Site subsoil Class D)

Period: T= 0.4 seconds

Building Importance Level 2

Annual probability of exceedance is taken as 1/500 for ultimate and 1/25 for serviceability

Elastic Site Hazard Spectrum for horizontal loading

$$C(T)=Ch(T)ZRN(T,D)$$

Horizontal Design Coefficient

$$Cd(T)=C(T)Sp/Kμ$$

$$\geq (Z/20+0.02)Ru \text{ but not less than } 0.03Ru$$

where Sp= 1.3-0.3μ for 1.0 ≤ μ ≤ 2.0, or = 0.7

Kμ= (μ-1)T/0.7 + 1 for T< 0.7 seconds

Seismic Coefficients

	SLS	ULS				
	μ= 1.0	μ= 1.0	μ= 1.25	μ= 2.0	μ= 3.0	μ= 3.5
Ch(T)	3.0	3.0	3.0	3.0	3.0	3.0
Z	0.3	0.3	0.3	0.3	0.3	0.3
Ru	0.25	1.0	1.0	1.0	1.0	1.0
N(T,D)	1.0	1.0	1.0	1.0	1.0	1.0
C(T)	0.225	0.9	0.9	0.9	0.9	0.9
Sp	0.7	1.0	0.925	0.7	0.7	0.7
Kμ	1.0	1.0	1.14	1.57	2.14	2.43
Cd(T)	0.158	0.900	0.728	0.401	0.294	0.259

- internal
(6+0) $V = 1.28 \times 1.25 \times (0.5 + 1.5)$ feet
 $= 0.80(6) + 2.00(2) = 3.20$

(1.26+1.50) $V = 4.56$

- below living room roof b.

(6+0) $V = 2.50 \times 3.85 \times (0.10)$ roof
 $+ 1.0 \times 2.40 \times (0.30)$ external
 $+ 1.28 \times 1.25 \times (0.5 + 1.5)$ floor
 $= 5.17(6) + 1.80(2) = 6.97$

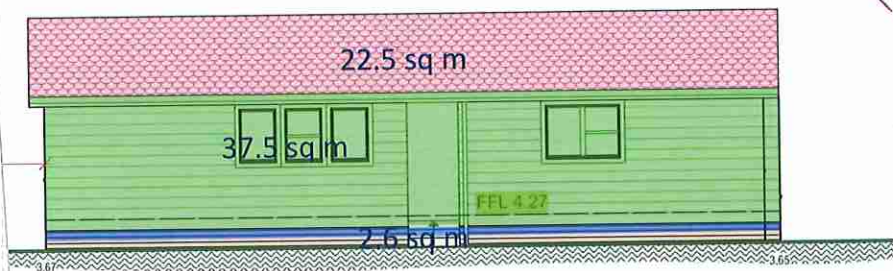
(1.26+1.50) $V = 3.90$

- internal + roof + cul

(6+0) $V = 0.80(6) + 2.40(2)$
 $+ 1.28 \times 3.61 \times (2.40)$
 $= 2.65(6) + 2.00(2)$

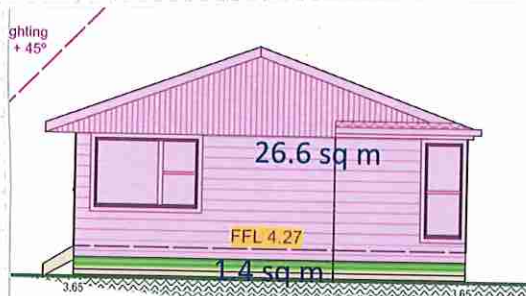
Refer attached spreadsheet results

lateral demands
see attached Berthgache / Susma
wind



ELEVATION C
scale 1:100

4300
setback to



ELEVATION B
scale 1:100

000
to boundary

across (W)

$$V' = (\tan 18^\circ \times 1.2 \times 23 \text{ m}^2$$

$$+ 37.5 \text{ m}^2 \times 1.2$$

$$+ 0.5 \times 1.2 \times 1.4 \text{ m}^2) \times 837$$

$$= 46 \text{ kN}$$

$$V'' = (26.6 \text{ m}^2 \times 1.2$$

$$+ 1.4 \text{ m}^2 \times 1.2 \times 0.5) \times 837$$

$$V_{req} = 27.4 \text{ kN}$$

$$V_{req} = 76.28 \text{ kN} \leftarrow \text{critical}$$

Per B1/VM4 Broms Equation for short free head piles in cohesive soil

$$H_u = 9 \cdot S_u \cdot D_s \cdot (\sqrt{2 \cdot ((f+L)^2 + (f+f_0)^2) - (L+2 \cdot f+f_0)})$$

Input values
 $\phi = 0.8$
 $d = 0.40 \text{ m}$
 $e = 0.600 \text{ m}$ height of applied load
 $L = 0.90 \text{ m}$ footing depth
 $S_u = 17 \text{ kPa}$
 $f_0 = 0.30 \text{ m}$ ignore top 0.3m

Calc values

$$(f+L)^2 = 2.3$$

$$(f+f_0)^2 = 0.81$$

$$(L+2f+f_0) = 2.4$$

$$\phi H_u = 3.62 \text{ kN}$$

$$g_c = \frac{3.62}{9 \times 17 \times 0.40 \times 0.80} + 0.30$$

$$= 0.373 \text{ m}$$

$$M_a = 3.62 \times \left(0.60 + 0.373 + \frac{3.62}{18 \times 17 \times 0.40 \times 0.80} \right)$$

$$= 3.39 \text{ kNm}$$

$$\phi M_a = 4.80 \text{ kNm}$$

125x125 Anchor pile OK 14170

Number of anchor piles

$$76.28 / 3.62 = 22$$

Project ref:

Date:

By:

Page:

6

$$H^L = 3.62 \text{ kN}$$

6 kN cantilevered pile fix

$$\phi H_u = 6.0 \times 0.80 = 4.80 \text{ kN}$$

Pch

Provide 22 No 400 ϕ x 900
deep concrete footings with
6 m pile hits

OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



Seismic Loads - Equivalent Static Distribution

Job Name : 116 Richard Street, Opotiki

Job No. : 2630-1

Element : Subfloor bracing

NZS3604 SED

$\mu = 3.5$

$\mu = 2.0$

$Cd(T) = 0.329$

$Cd(T) = 0.401$ (see assumed loadings spreadsheet)

Engineer : CM

Date : 26/11/2024

Building Weight

Roof		
Roofing	0.40kPa x 124m2	49.60
1/2 Upper Walls External	0.5 x 0.30kPa x 2.4m x 44m	15.84
1/2 Upper Walls Internal	0.5 x 0.30kPa x 2.4m x 40m	14.40
W roof =		79.84 kN

Ground Floor			
1/2 Lower Walls External	0.5 x 0.30kPa x 2.4m x 44m	15.84	Area Lower Floor 100 m2
1/2 Lower Walls Internal	0.5 x 0.30kPa x 2.4m x 40m	14.40	$\psi_a (floor) = 0.3 + 3/VA = 0.60$
Upper Floor	0.50kPa x U.F.area	50.00	Area Lower Deck 3 m2
Seismic Live - Floor	0.3 x ψ_a x 1.5kPa x U.F.area	27.00	$\psi_a (deck) = 0.3 + 3/VA = 1.00$
Decks	0.45kPa x U.D.area	1.35	
Seismic Live - Deck	0.3 x ψ_a x 2.0kPa x U.D.area	1.80	
W lower floor =		110.39 kN	
Wt =		190.23 kN	

Base Shear Demand

$V = Cd(T).Wt = 62.59 \text{ kN}$

$\mu = 3.5$

$\mu = 2.0$

NZS3604

Load Distribution	Wi	Hi	WiHi	WiHi/ΣWiHi	Vi = 0.92 x WiHi/ΣWiHi x V (+0.08V at roof level)	Vi Cum.	BU
Upper Level	79.84 kN	3.45 m	275	0.735	47.32 kN	47.32 kN	946
Subfloor	110.39 kN	0.90 m	99	0.265	15.26 kN	62.59 kN	1252

375

Upper level	SED	
	Vi = 0.92 x WiHi/ΣWiHi x V (+0.08V at roof level)	Vi Cum.
	57.68 kN	57.68 kN
Subfloor	18.60 kN	76.28 kN

Footing Vertical Capacity Checks

Job Name : 116 Richard Street, Opotiki

Engineer : CM

Job No. : 2630-1

Date : 26/11/2024

Location: interior supporting roof and ceiling

Footing Width B 0.35 m dia x $A_{circle} = 0.10 \text{ m}^2$
 Footing Depth D 0.9 m $\gamma = 15 \text{ kN/m}^3$ per geotech report

Loads

Dead	footing - soil weight	0.87
	Roof	roof beam
	Wall	
	Floor	per attached calcs
		2.65
	Total Dead Load	$G = 3.52 \text{ kN}$
Live	Floor	per attached calcs
		2.40
	Total Live Load	$Q = 2.40 \text{ kN}$
		or = 1.80 kN

SLS check

Footing SLS Load (G+0.5Q)		
per geotech	Stiffness=	12100 kN/m3
	Settlement limit=	20 mm
		$V = 4.72 \text{ kN}$
		$\Delta = 4.05 \text{ mm}$
	OK	20 % of limit

ULS Check

Footing ULS Load (1.2G + 1.5Q)		
per geotech	UBC=	189 kPa
	$\phi =$	0.45 SRF
		at 0.9m depth
		$V^* = 7.82 \text{ kN}$
		$\phi V_u = 8.18 \text{ kN}$
	OK	105 % capacity

Provide a minimum of 0.35 m dia x 0.9 m deep footing for interior supporting roof and ceiling

Footing Vertical Capacity Checks

Job Name : 116 Richard Street, Opotiki

Engineer : CM

Job No. : 2630-1

Date : 26/11/2024

Location: external wall piles

Footing Width B 0.35 m dia x A circle= 0.10 m2

Footing Depth D 0.9 m γ= 15 kN/m3

Loads

Dead

footing - soil weight

0.87

Roof

yes

Wall

yes

Floor

yes per attached calcs

3.39

Total Dead Load

G = 4.26 kN

Live

Floor

per attached calcs

1.29

Total Live Load

Q = 1.29 kN

or= 1.80 kN

SLS check

Footing SLS Load (G+0.5Q)

V = 5.16 kN

per geotech

Stiffness= 12100 kN/m3

Δ = 4.43 mm

Settlement limit= 20 mm

OK 22 % of limit

ULS Check

Footing ULS Load (1.2G + 1.5Q)

V*= 7.81 kN

per geotech

UBC= 189 kPa at 0.9m depth

ØVu= 8.18 kN

Ø= 0.45 SRF

OK 105 % capacity

Provide a minimum of 0.35 m dia x 0.9 m deep footing for external wall piles

Footing Vertical Capacity Checks

Job Name : 116 Richard Street, Opotiki

Engineer : CM

Job No. : 2630-1

Date : 26/11/2024

Location: interior no roof or ceiling

Footing Width B 0.3 m dia x $A_{circle} = 0.07 \text{ m}^2$
 Footing Depth D 0.9 m $\gamma = 15 \text{ kN/m}^3$ per geotech report

Loads

Dead footing - soil weight 0.64
 Roof no
 Wall
 Floor per attached calcs 0.80
 Total Dead Load $G = 1.44 \text{ kN}$

Live Floor per attached calcs 1.62
 Total Live Load $Q = 1.62 \text{ kN}$
 or = 1.80 kN

SLS check

Footing SLS Load (G+0.5Q) $V = 2.34 \text{ kN}$
 per geotech Stiffness= 12100 kN/m3 $\Delta = 2.73 \text{ mm}$
 Settlement limit= 20 mm **OK 14 % of limit**

ULS Check

Footing ULS Load (1.2G + 1.5Q) $V^* = 4.42 \text{ kN}$
 per geotech UBC= 189 kPa at 0.9m depth
 $\phi = 0.45 \text{ SRF}$ $\phi V_u = 6.01 \text{ kN}$
 OK 136 % capacity

Provide a minimum of 0.3 m dia x 0.9 m deep footing for interior no roof or ceiling

Footing Vertical Capacity Checks

Job Name : 116 Richard Street, Opotiki

Engineer : CM

Job No. : 2630-1

Date : 26/11/2024

Location: supports living roof beam

Footing Width B 0.4 m dia x $A_{circle} = 0.13 \text{ m}^2$
 Footing Depth D 0.9 m $\gamma = 15 \text{ kN/m}^3$ per geotech report

Loads

Dead	footing - soil weight	1.13
	Roof	roof beam
	Wall	
	Floor	per attached calcs
		5.17
	Total Dead Load	$G = 6.30 \text{ kN}$
Live	Floor	per attached calcs
		1.62
	Total Live Load	$Q = 1.62 \text{ kN}$
		or = 1.80 kN

SLS check

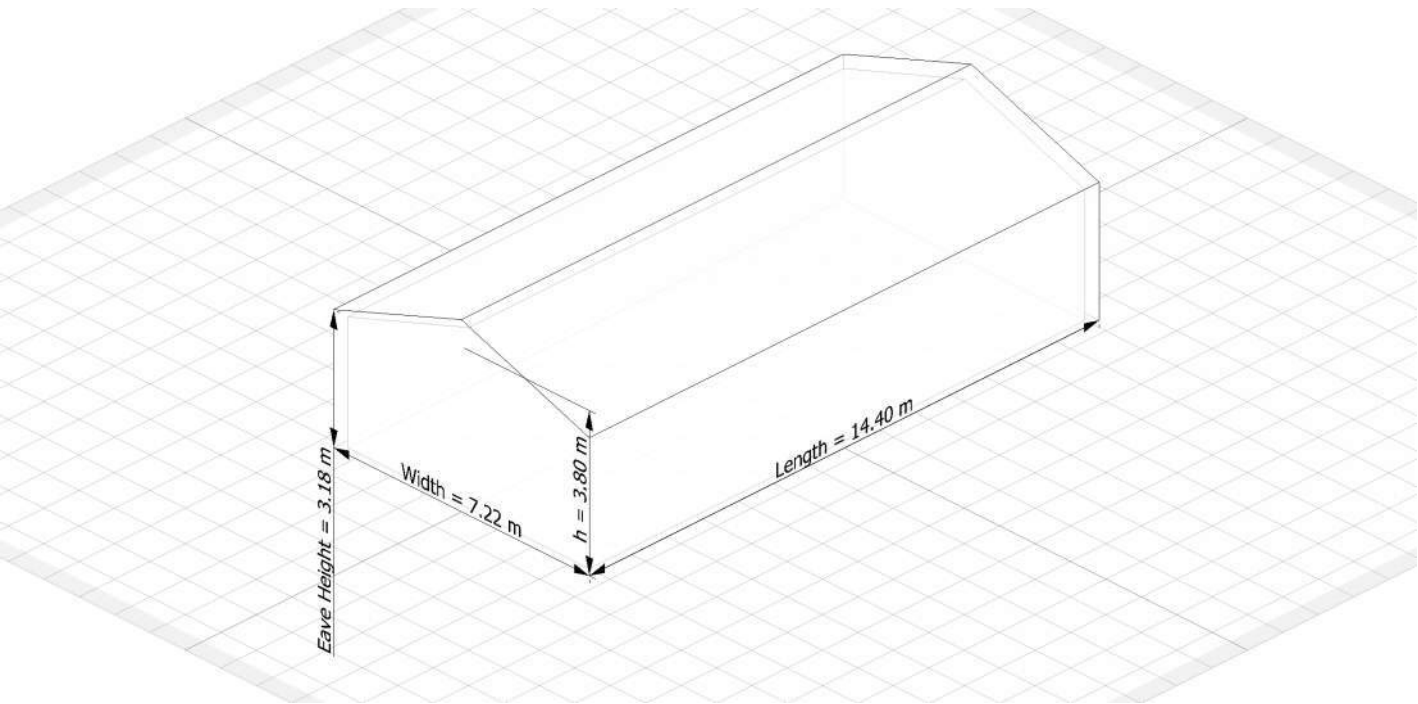
Footing SLS Load (G+0.5Q)		
per geotech	Stiffness=	12100 kN/m3
	Settlement limit=	20 mm
		$V = 7.20 \text{ kN}$
		$\Delta = 4.74 \text{ mm}$
	OK	24 % of limit

ULS Check

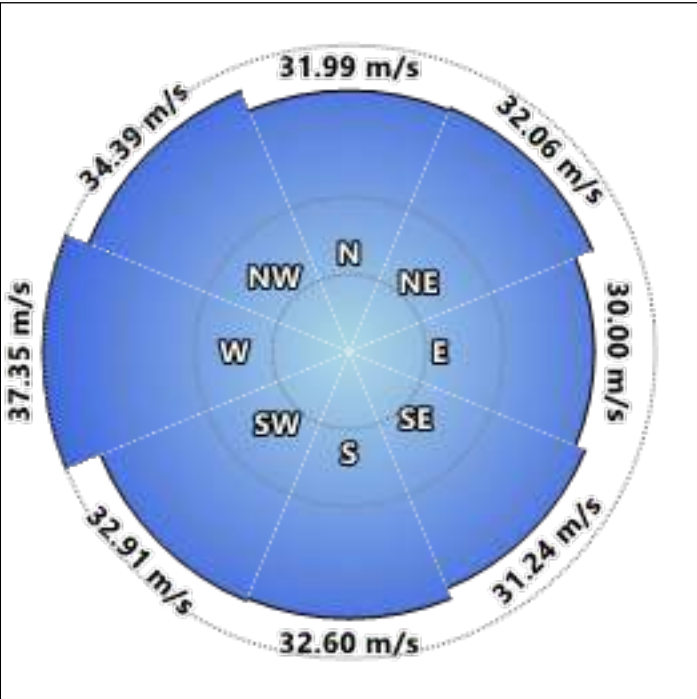
Footing ULS Load (1.2G + 1.5Q)		
per geotech	UBC=	189 kPa
	$\phi =$	0.45 SRF
		at 0.9m depth
		$V^* = 10.26 \text{ kN}$
		$\phi V_u = 10.69 \text{ kN}$
	OK	104 % capacity

Provide a minimum of 0.4 m dia x 0.9 m deep footing for supports living roof beam

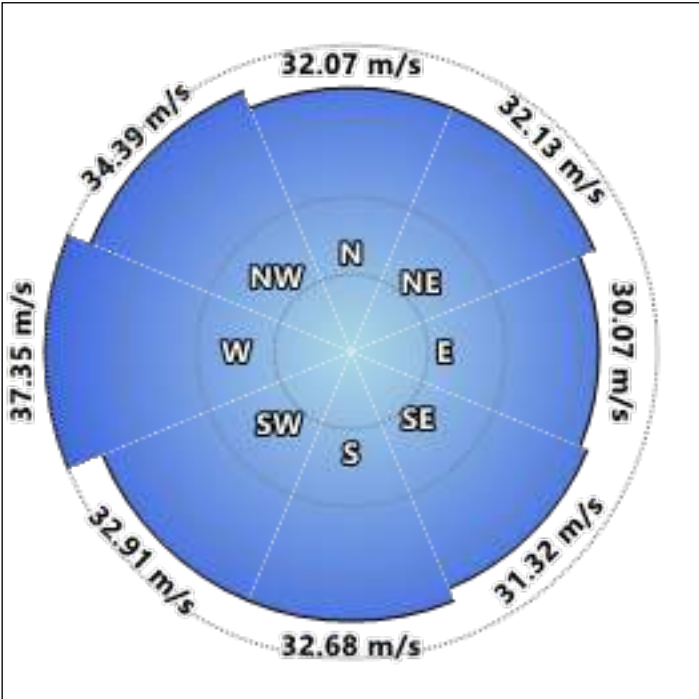
STRUCTURE:	HOUSE	LATITUDE:	-38.008797	CRITICAL DIRECTION:	West
ORIENTATION:	0°	LONGITUDE:	177.288984	Md:	1.0
WIDTH:	7.22 m	ELEVATION:	3.50 m	Mc:	1.0
LENGTH:	14.40 m			TC:	3.0
HEIGHT (h):	3.80 m	WIND REGION:	NZ2	Mz,cat:	0.83
BASE RL:	0.00 m	ULTIMATE ARI:	500 YEARS	Ms:	1.0
		ULTIMATE VR:	45 m/s	Mh:	1.0
		SERVICEABILITY VR:	39 m/s	Mlee:	1.0
				Mel:	1.0
				Mt:	1.0
				Vsit,β:	37.35 m/s
				qsit,β:	0.8370 kPa
				Vserv,β:	32.37 m/s
				qserv,β:	0.6287 kPa



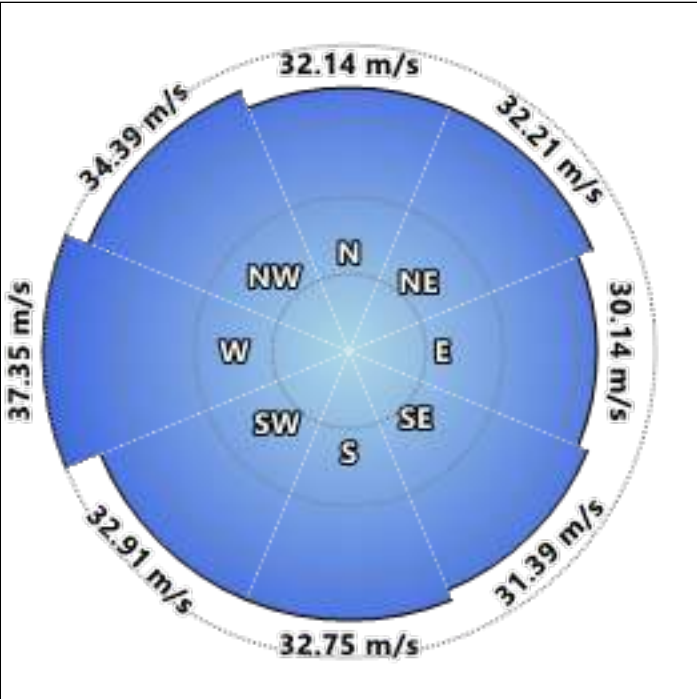
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



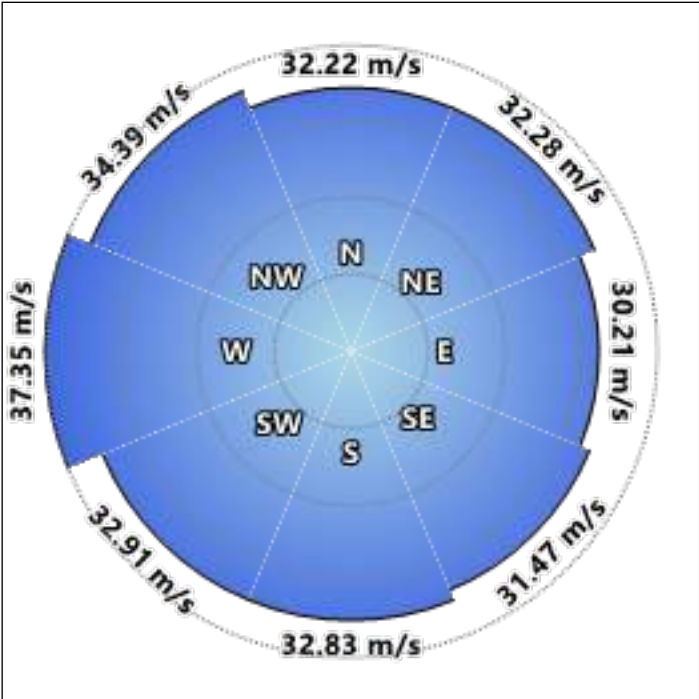
Wind Rose @ z = 0.00 m



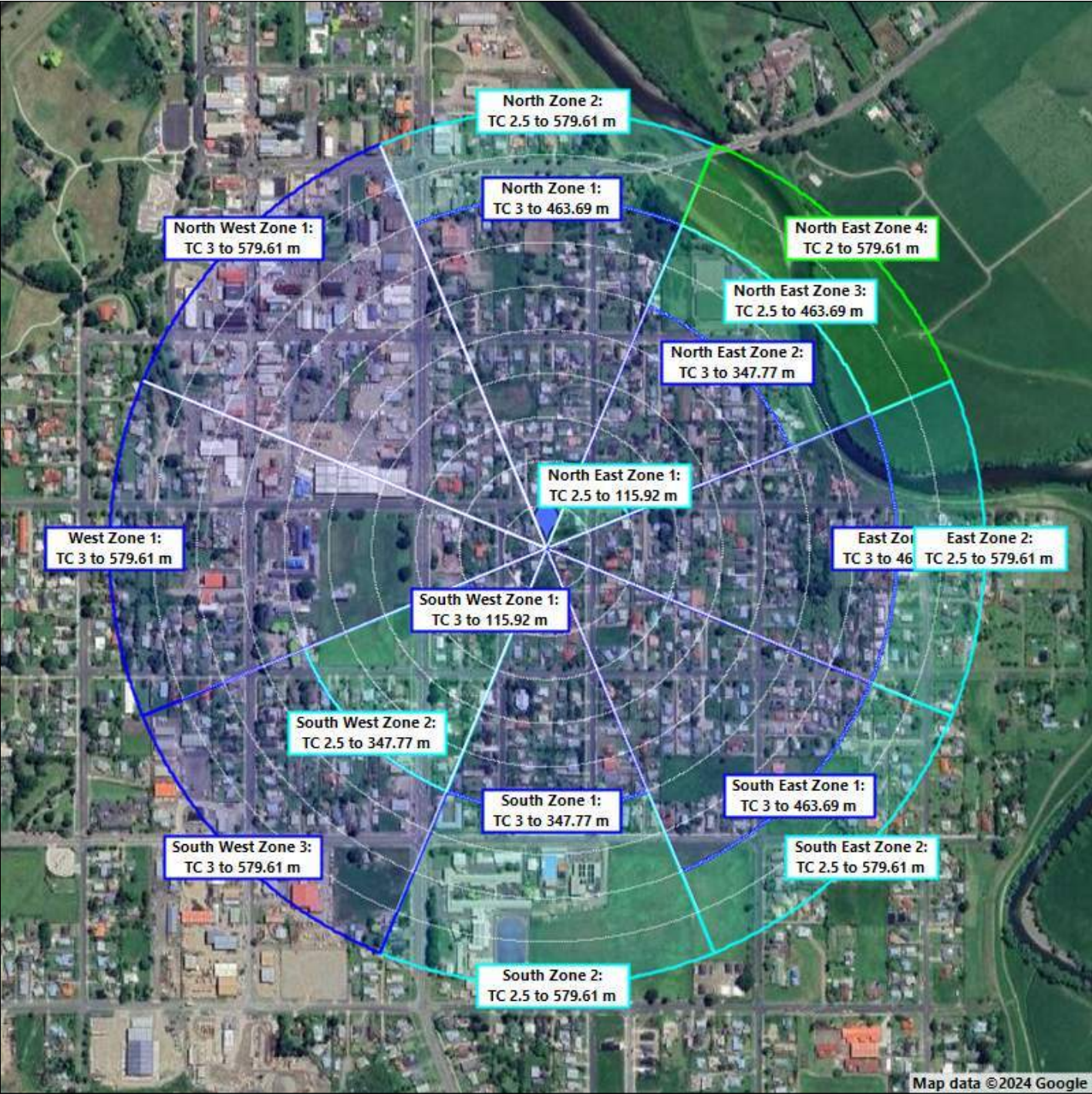
Wind Rose @ z = 1.27 m



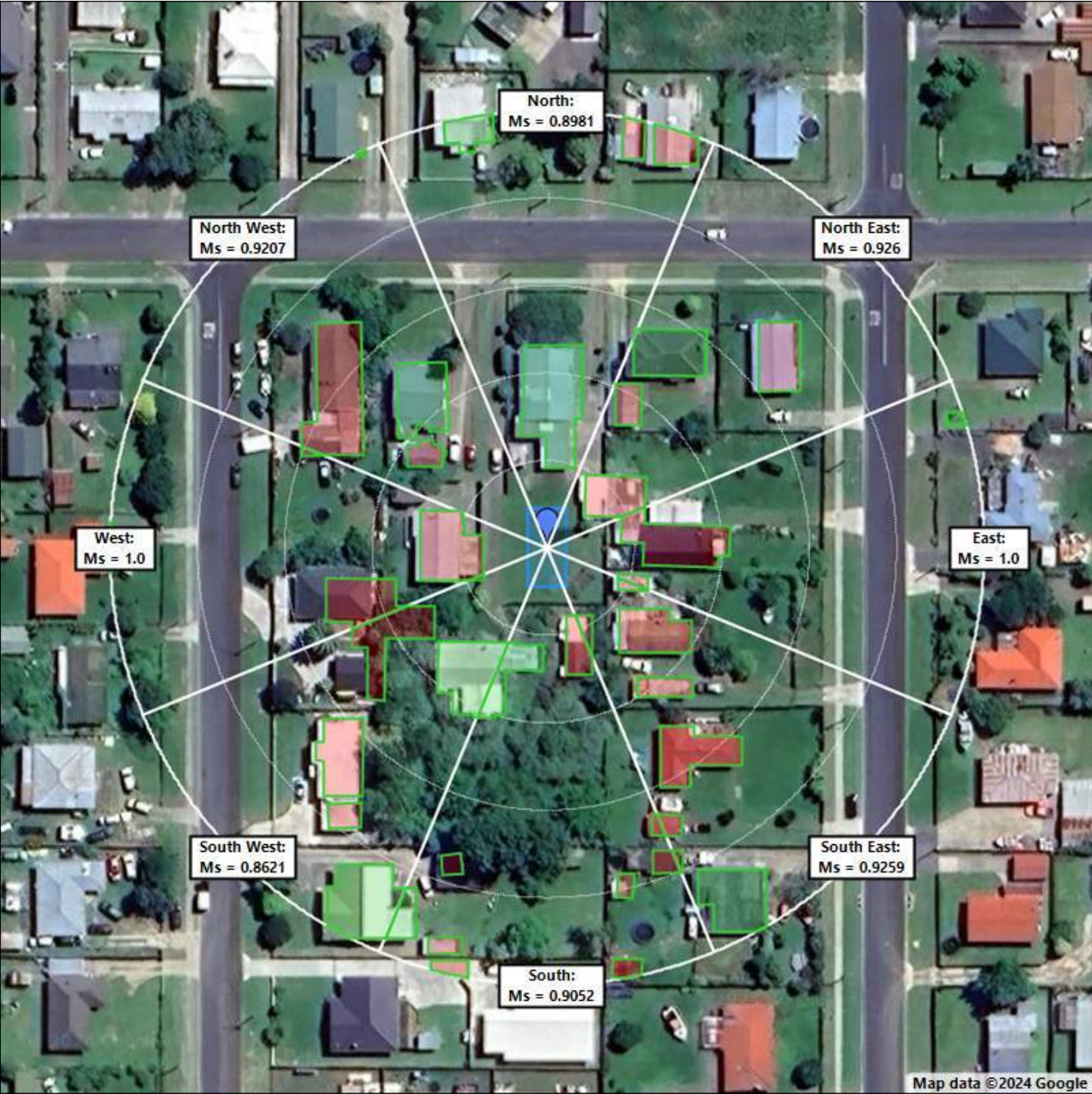
Wind Rose @ z = 2.53 m



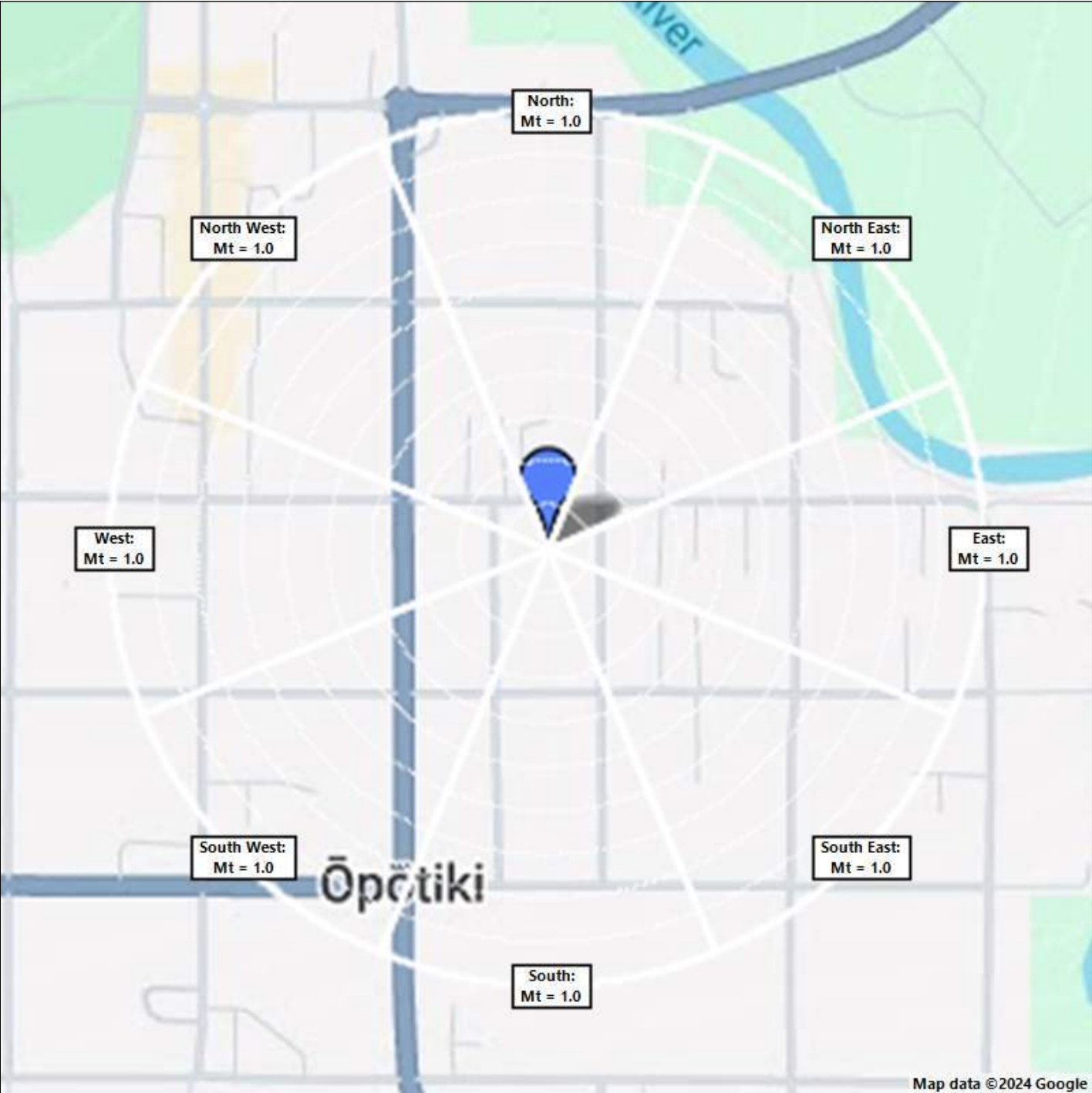
Wind Rose @ z = 3.80 m



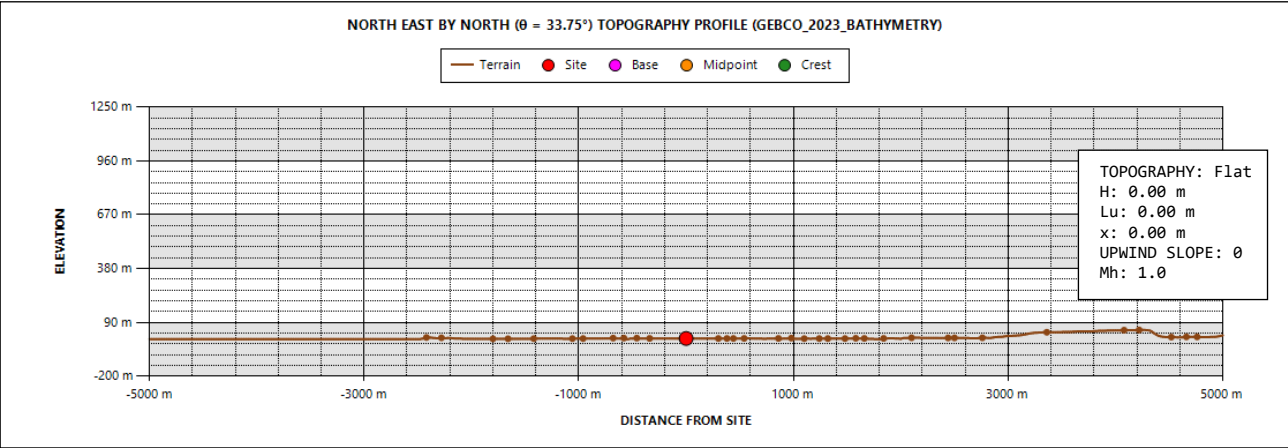
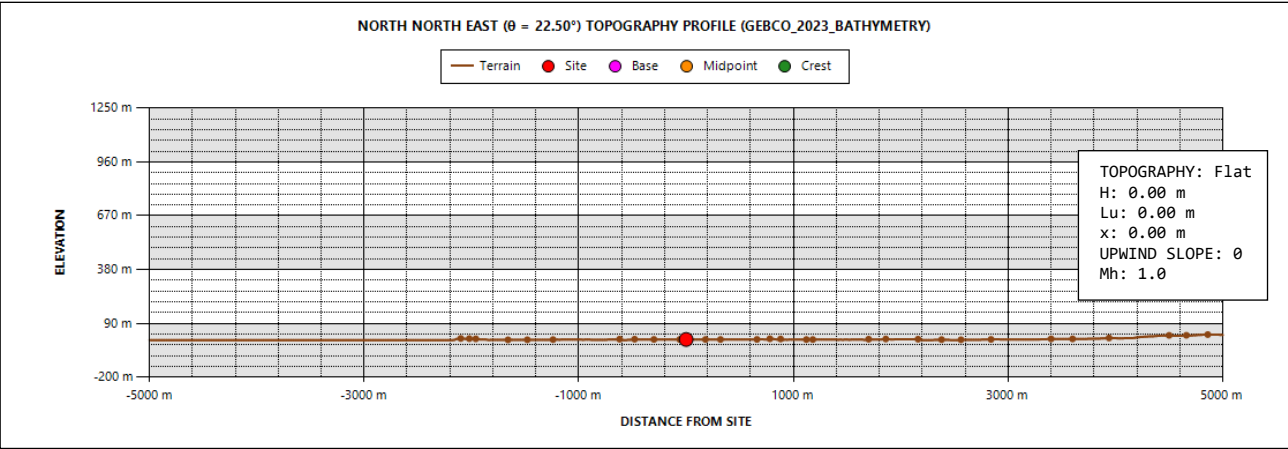
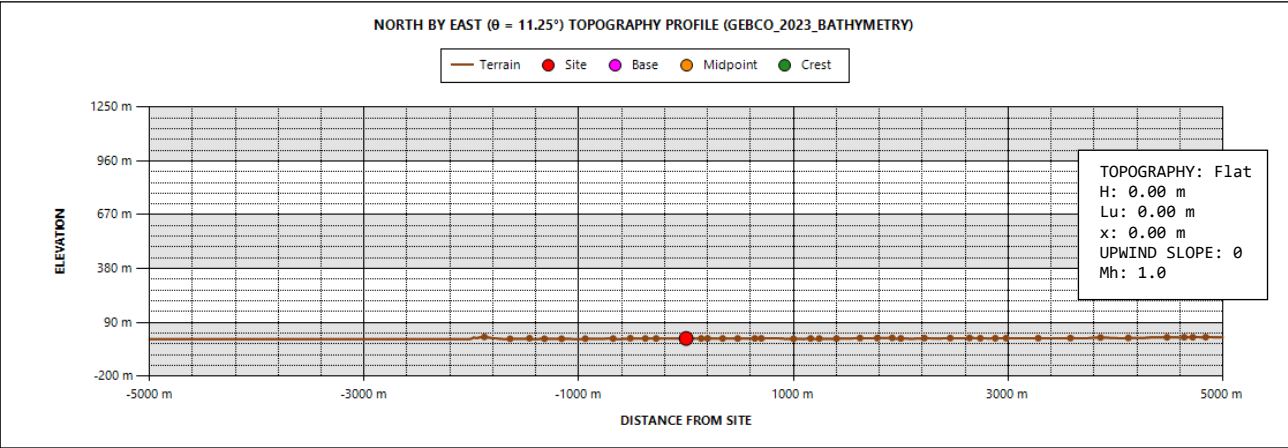
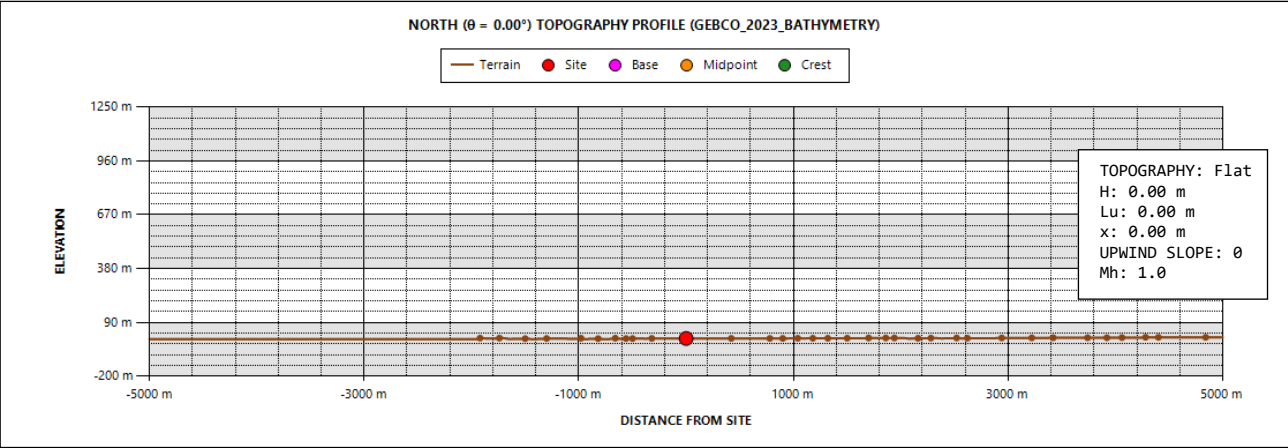
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



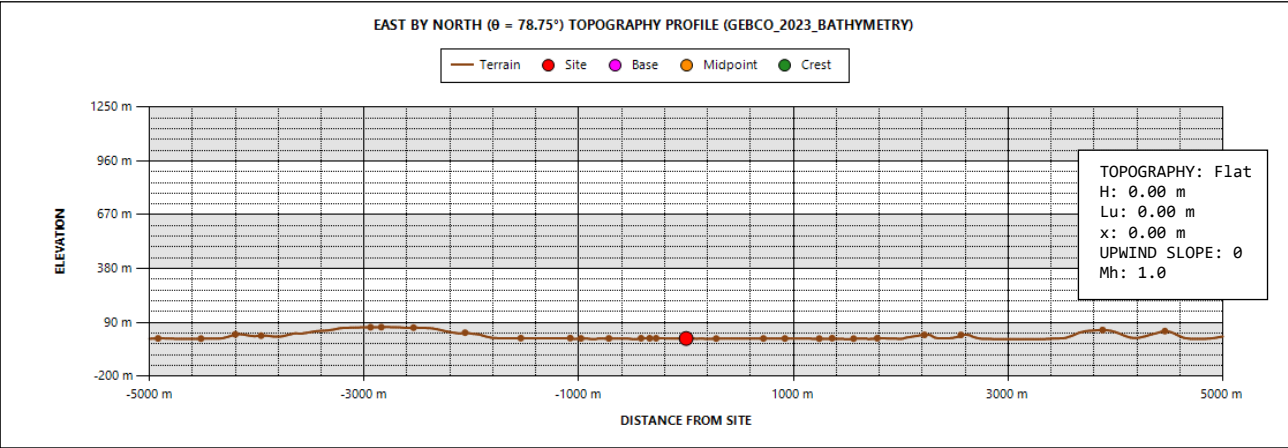
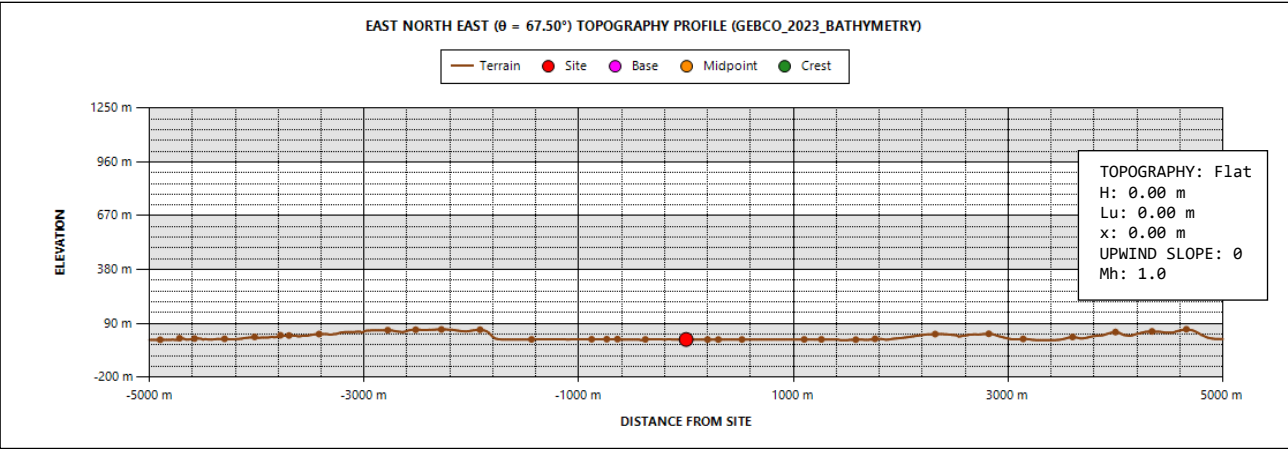
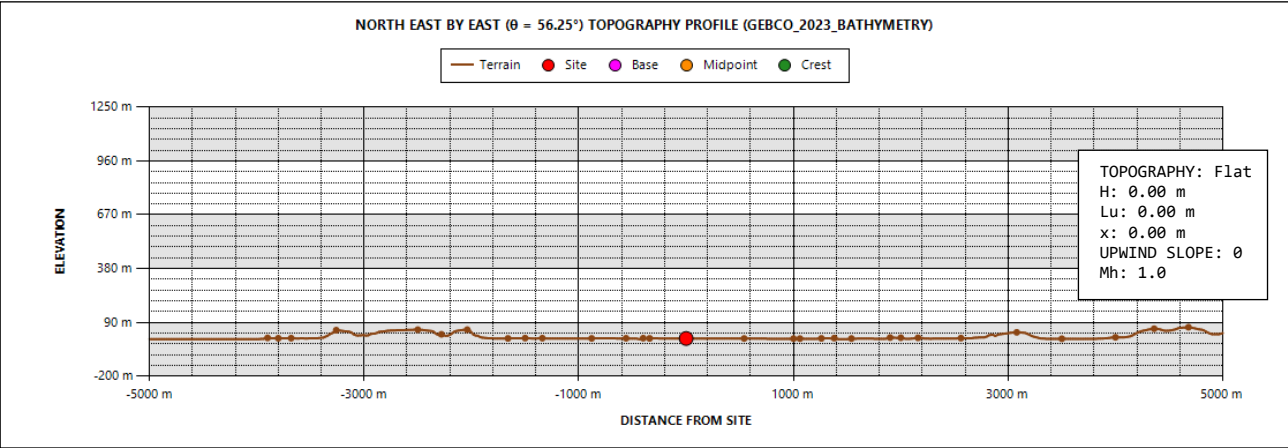
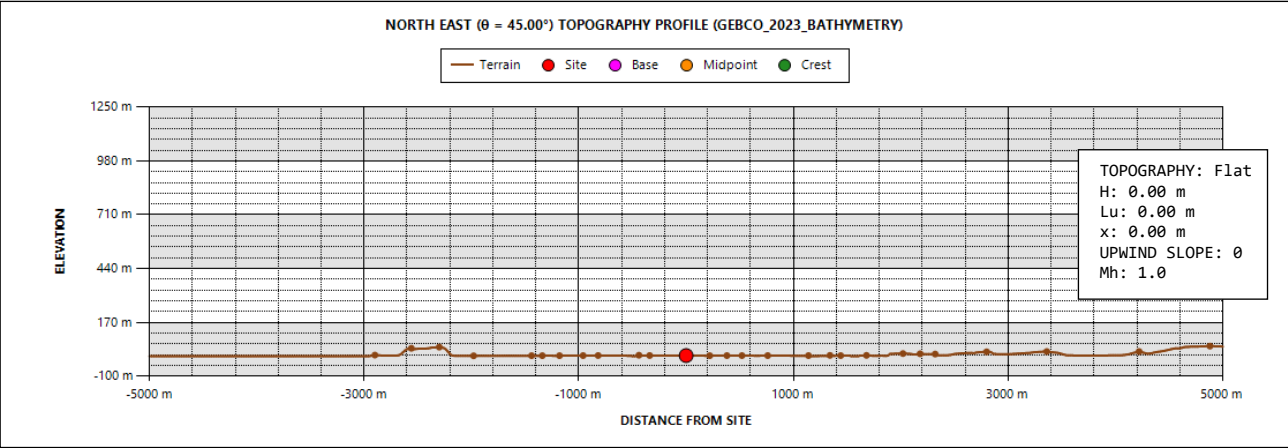
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



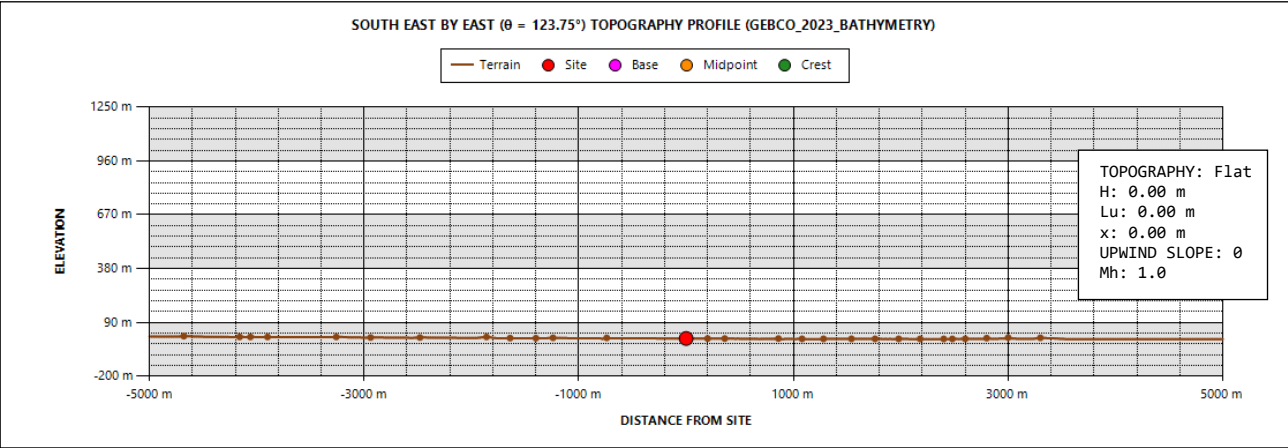
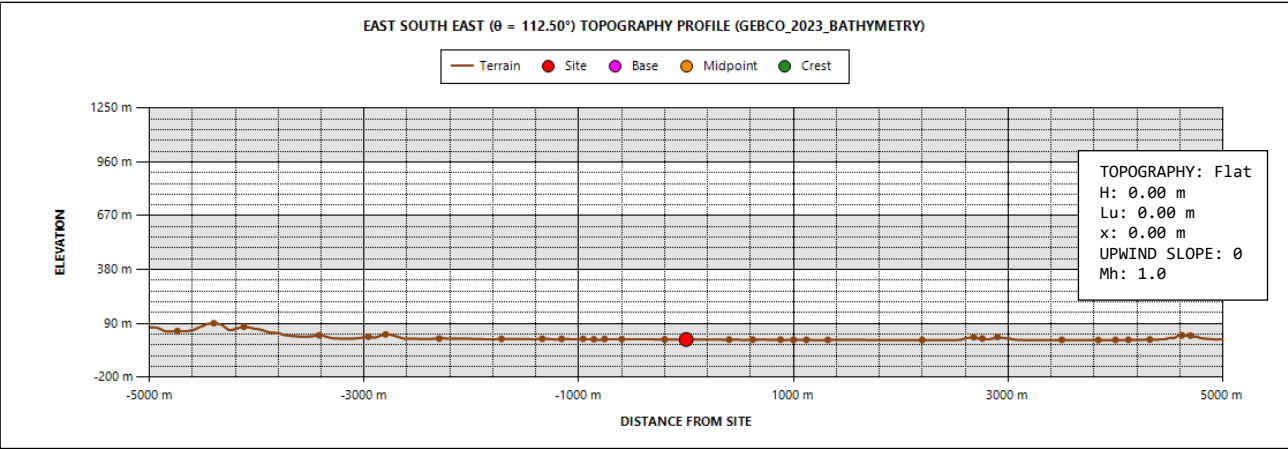
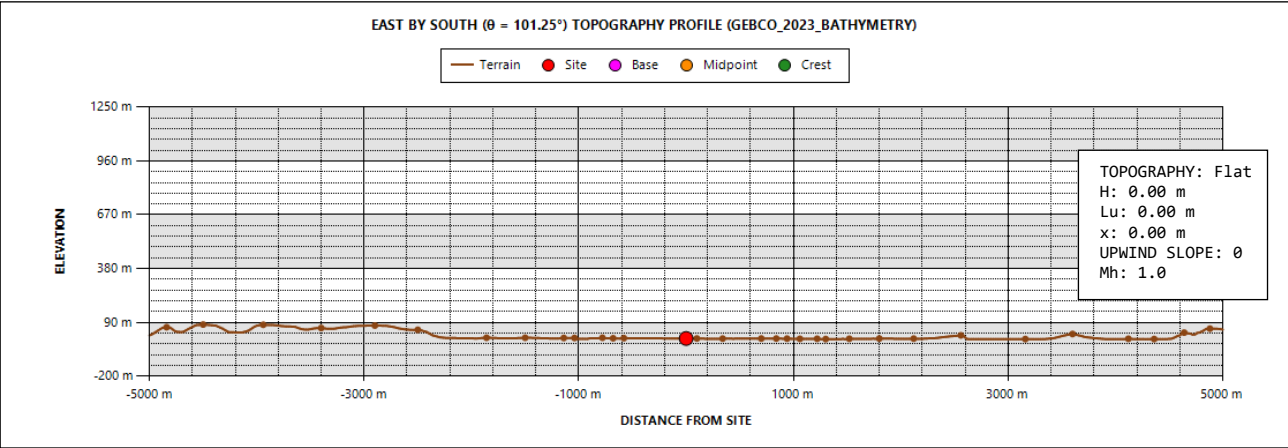
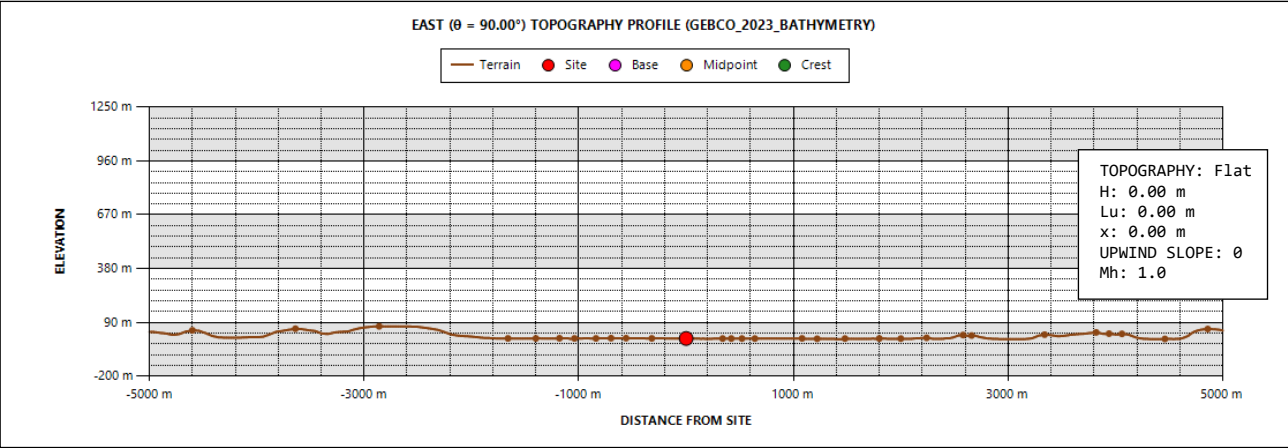
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



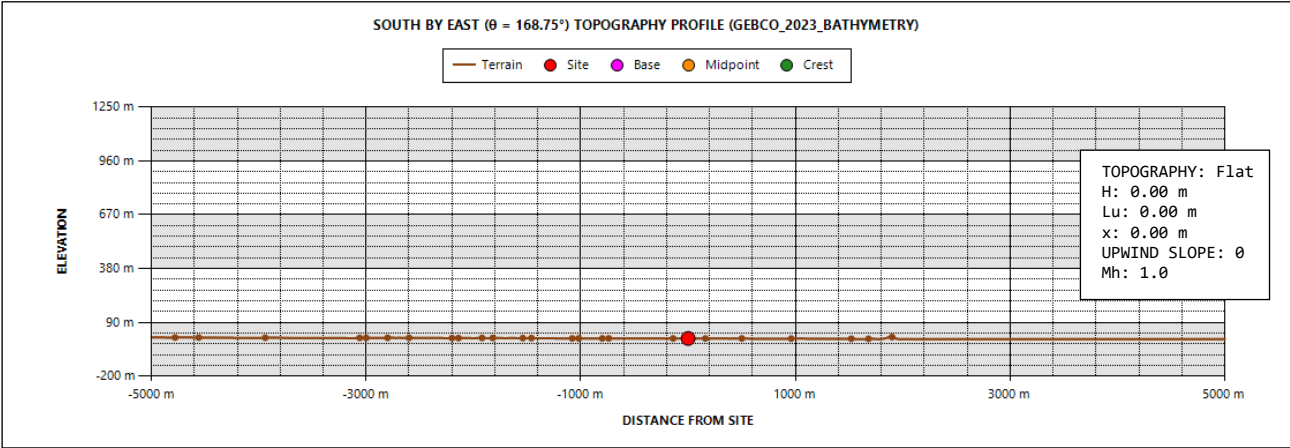
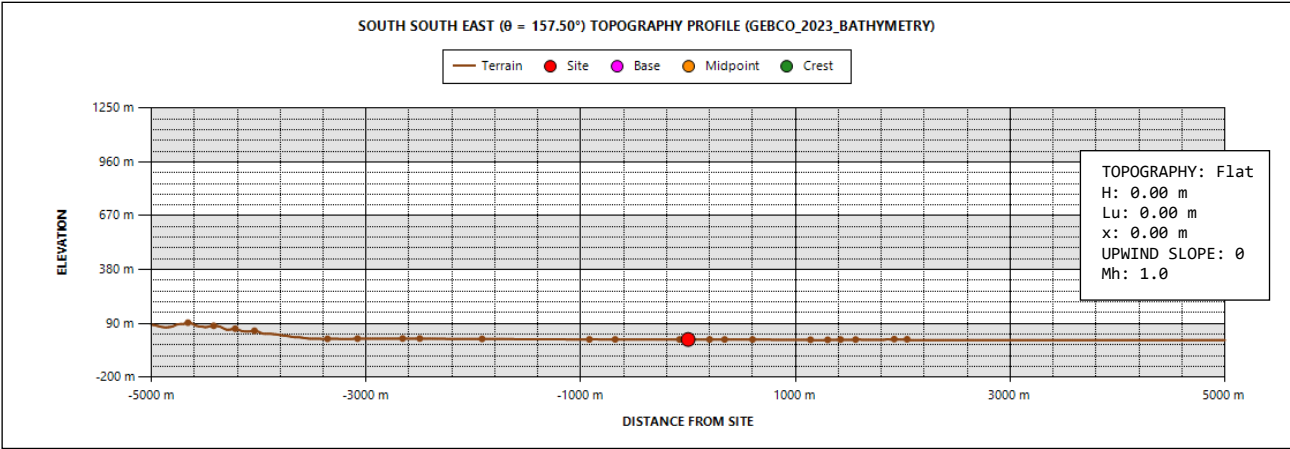
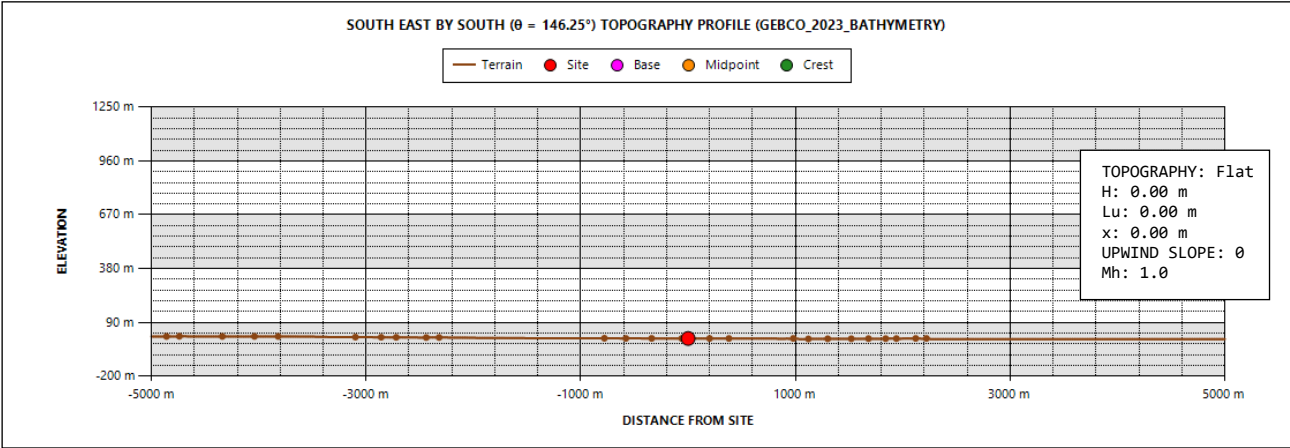
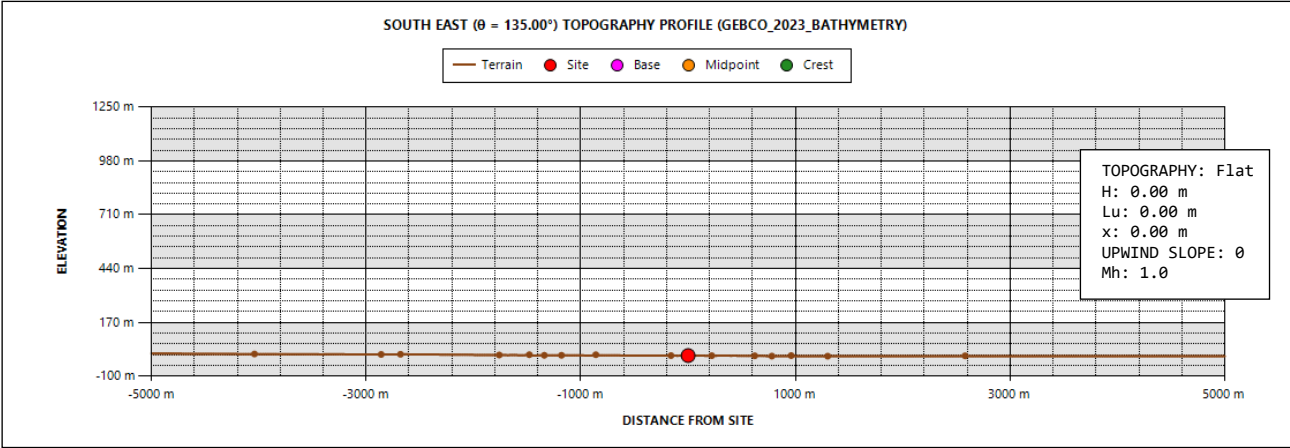
OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025

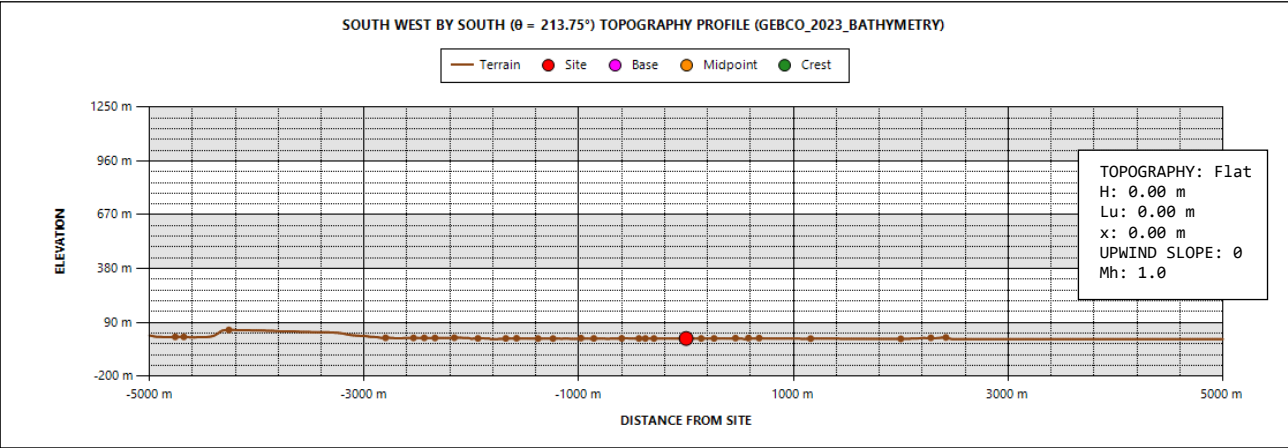
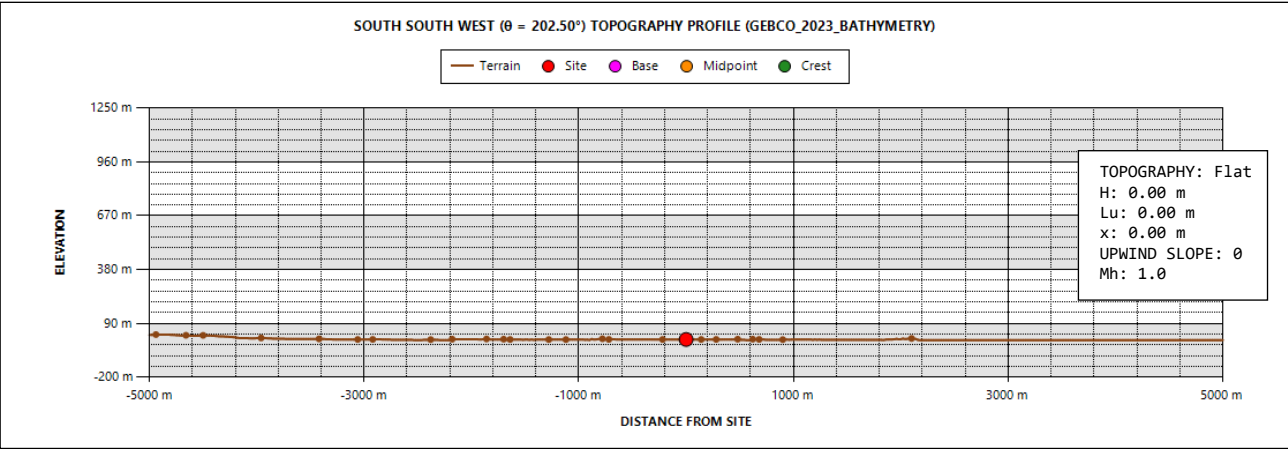
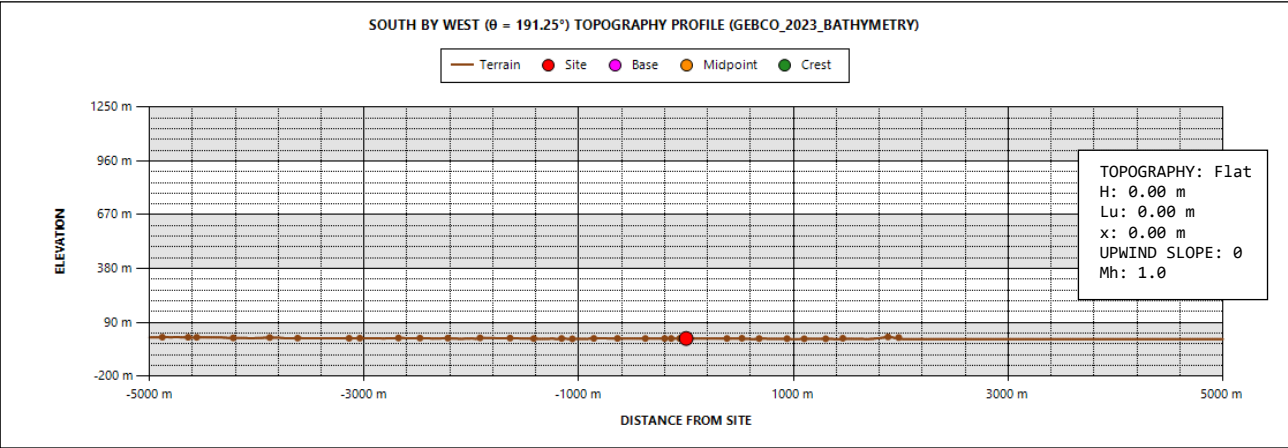
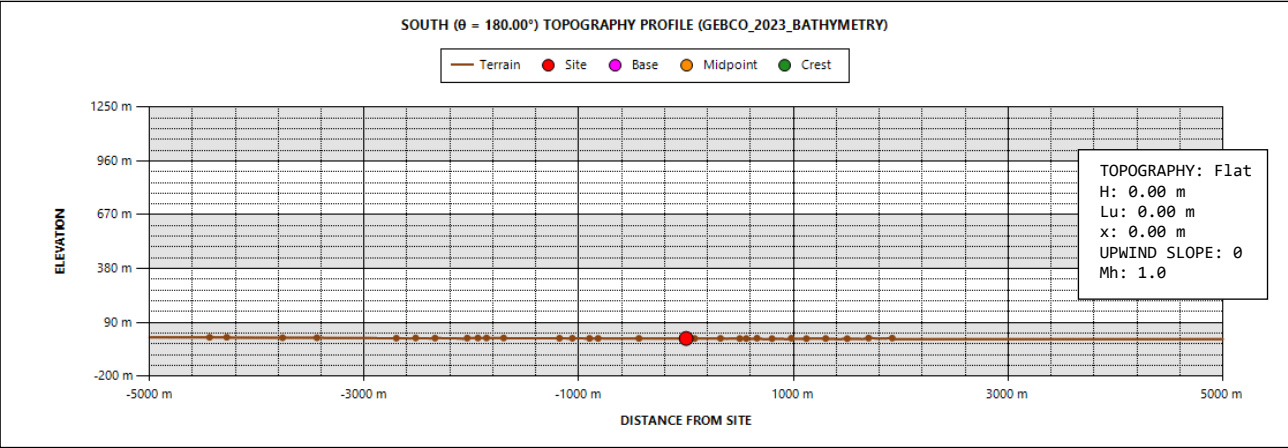


OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025

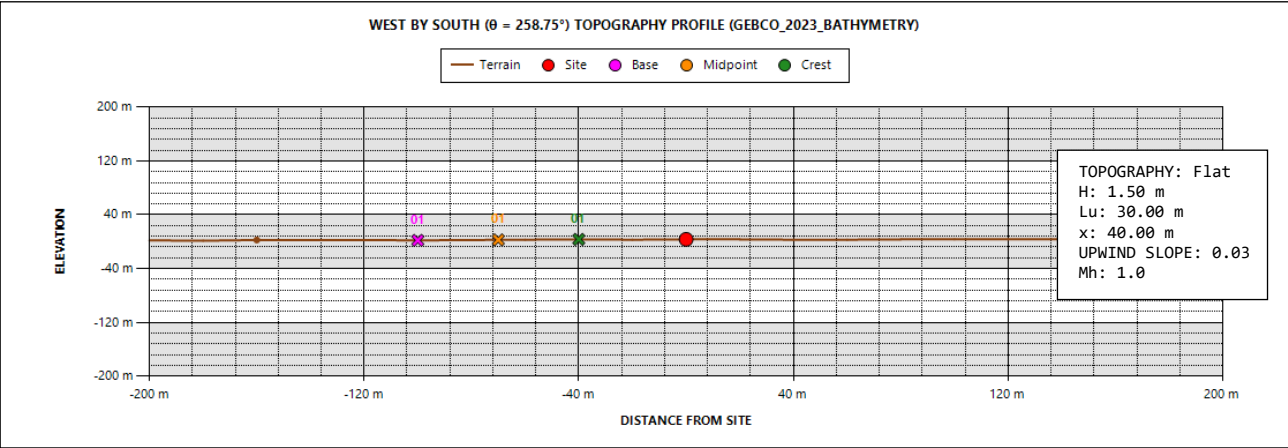
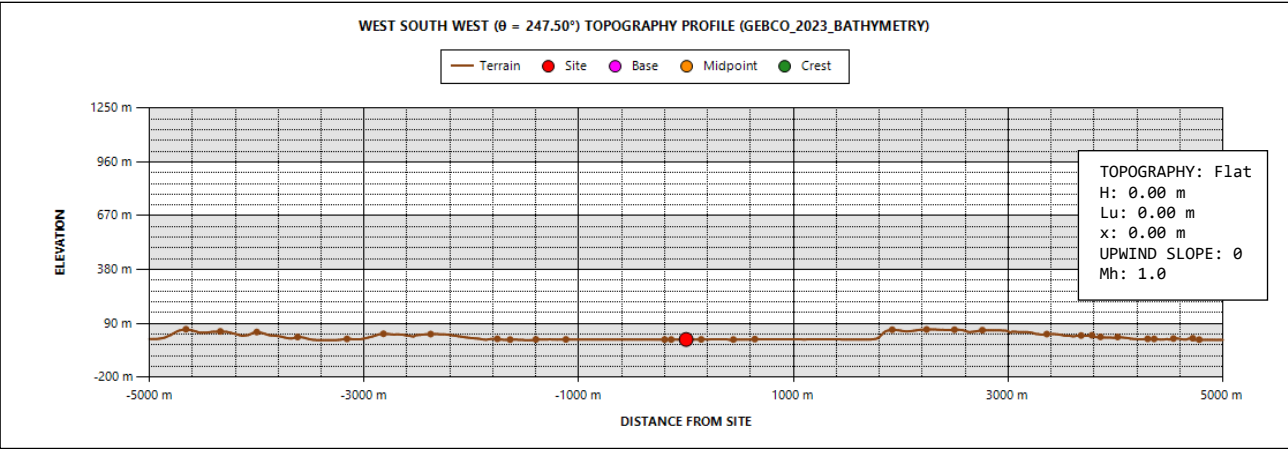
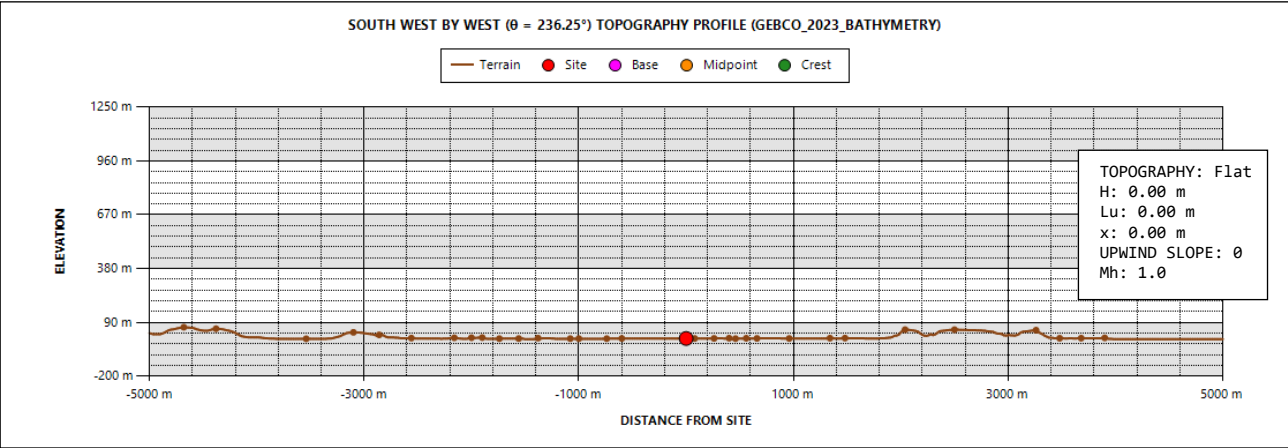
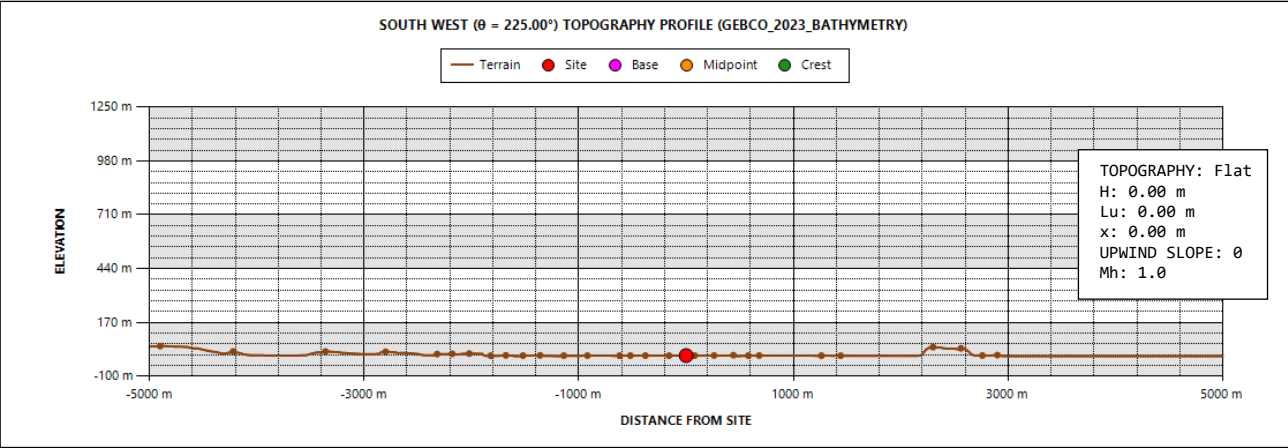


OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025

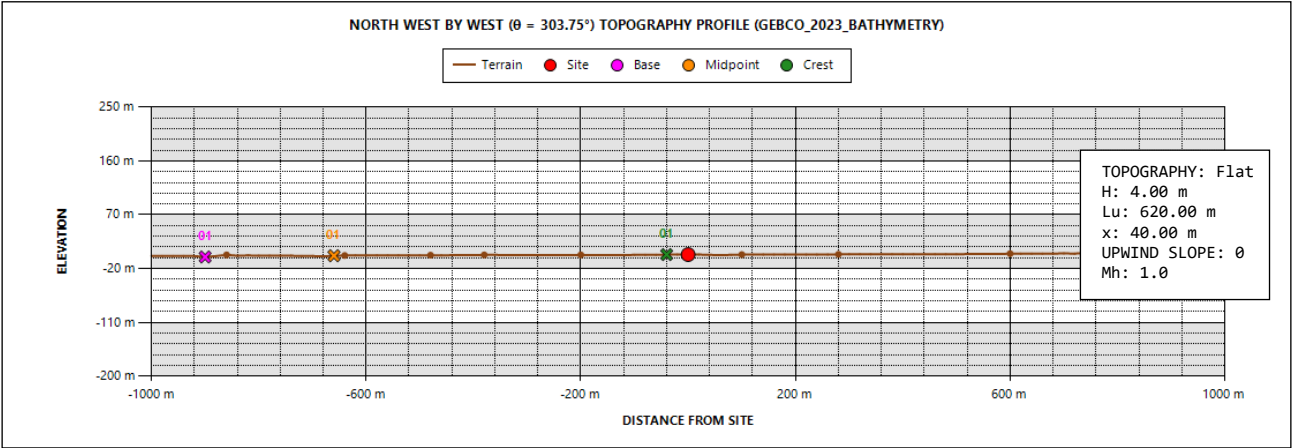
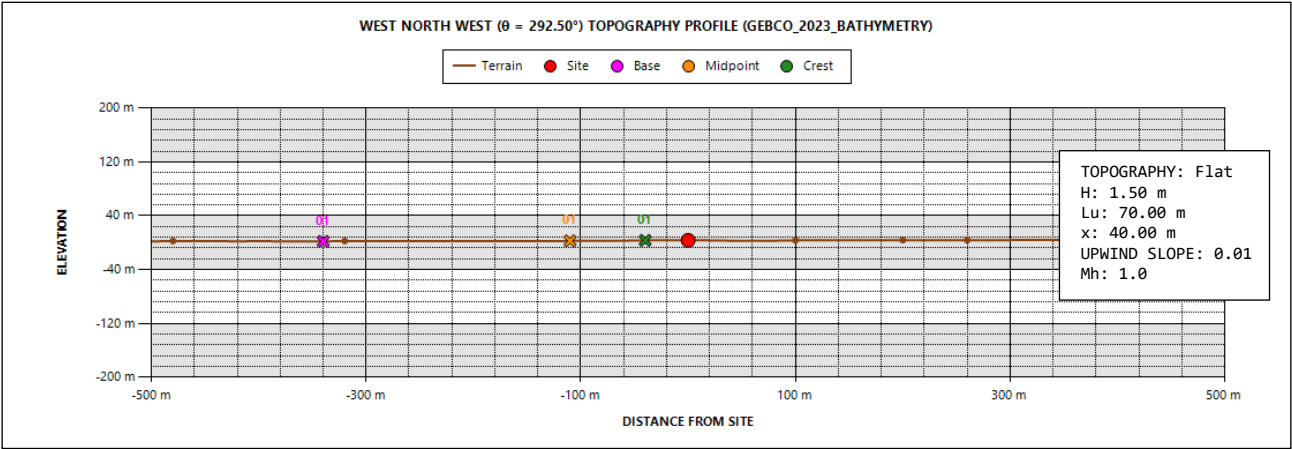
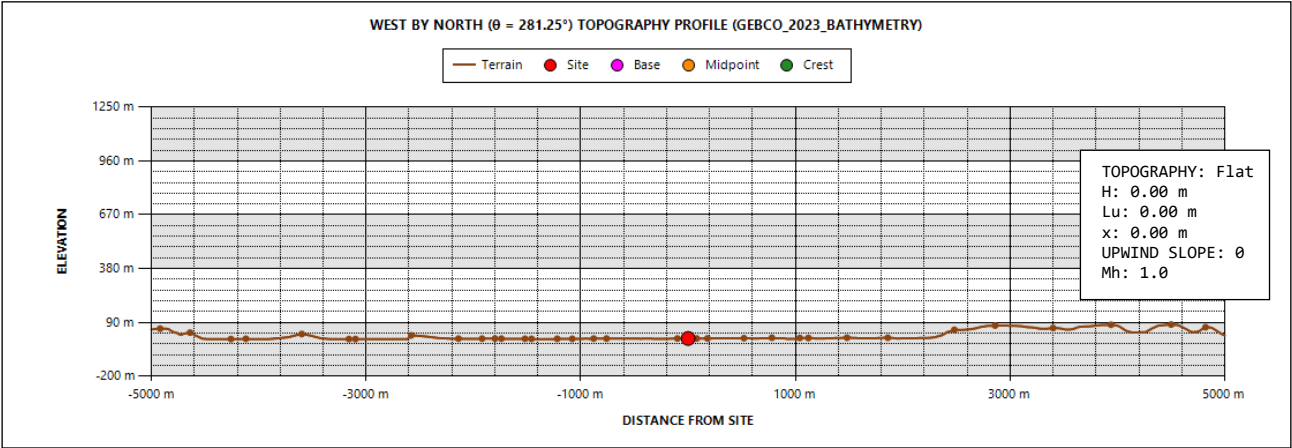
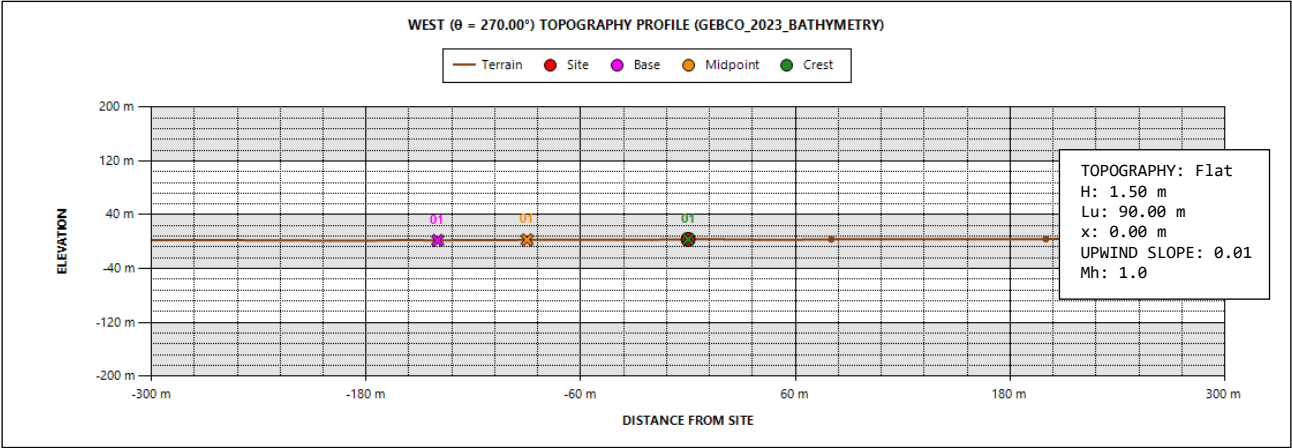


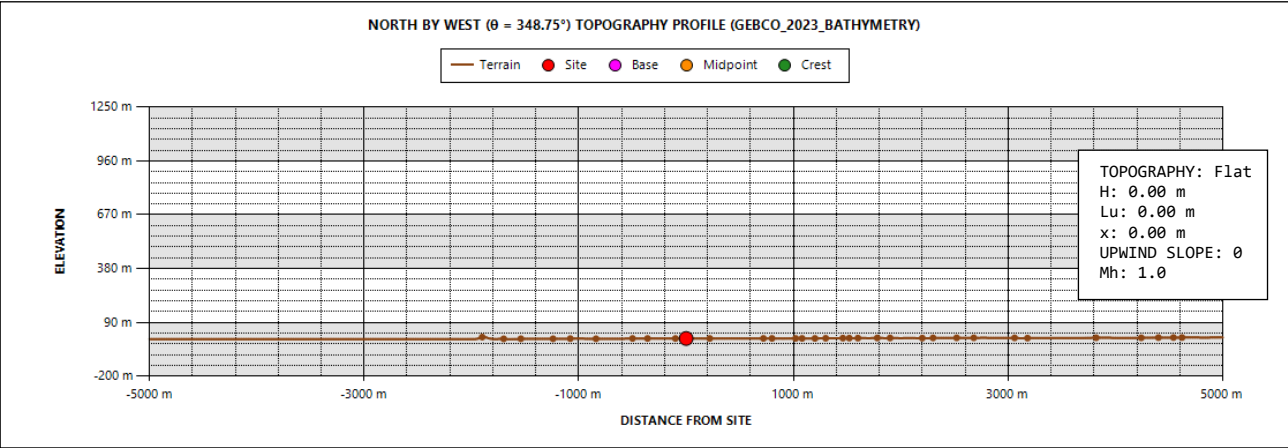
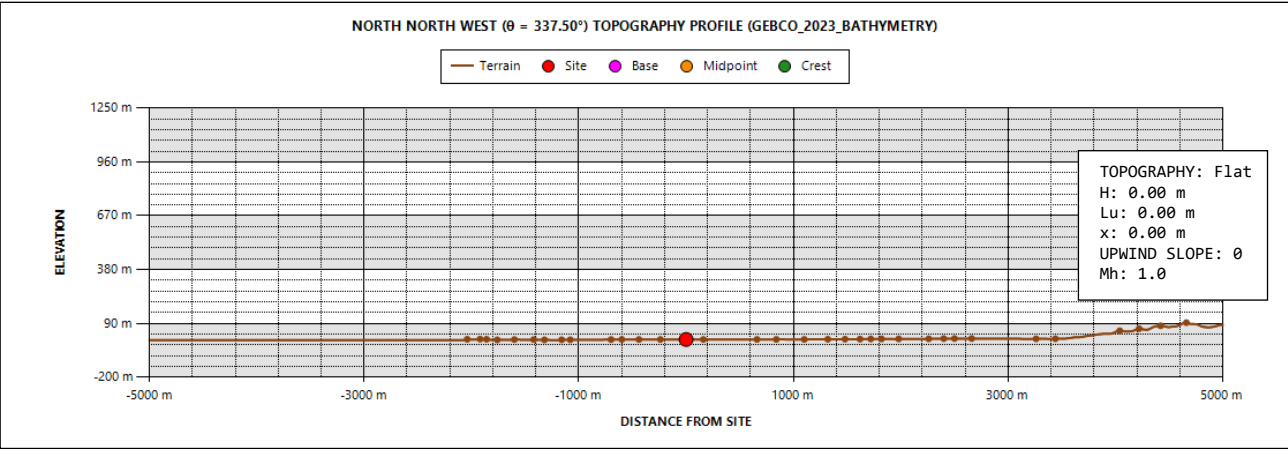
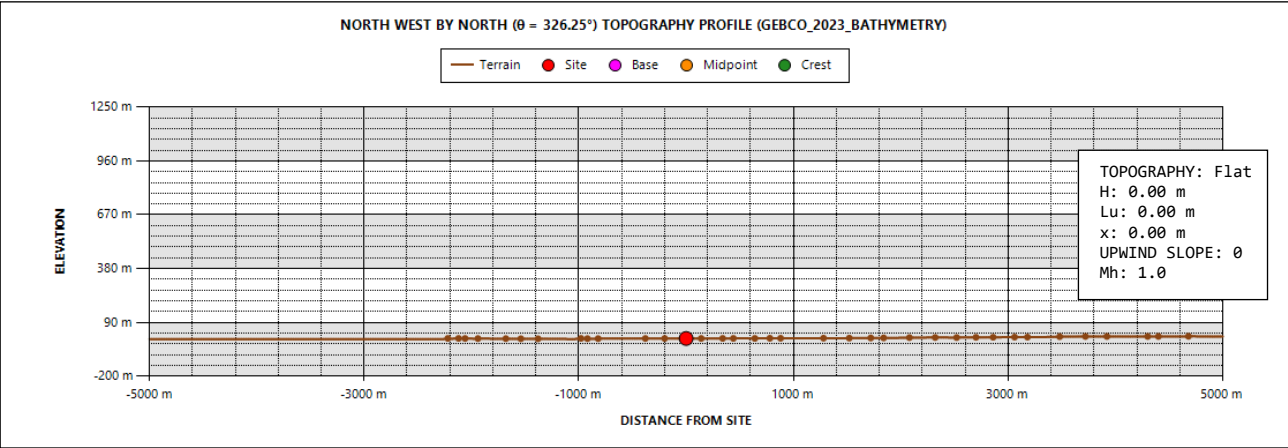
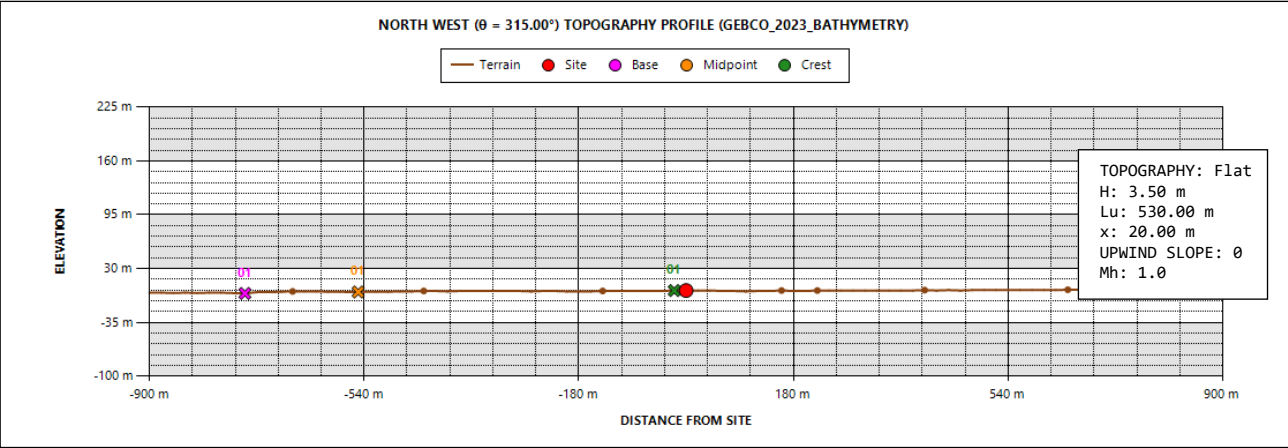


OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025



OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025





OPOTIKI DISTRICT COUNCIL - BC4294 - Approved Documents - 20/01/2025

RE: 116 Richard Street

To John Thompson-Harawira <jtdesigns2015@xtra.co.nz>

Tēnā koe (Hi) John,

Yes included subfloor bracing. Anchor piles in this case only need 6kN connections as ratings are lower than normal and a few more.

That's the advantage of SED subfloor design.

Nga mihi (Kind Regards)

Craig Manktelow

Engineering Manager | Chartered Engineer

MANKTELOW CONSULTING ENGINEERS

1st Floor, 240 The Strand

P.O. Box 474, Whakatane 3158, NZ

Ph. 073072002 **Mob.** 0276125548

Email craig@mcel.co.nz **Website** www.mcel.co.nz

This email contains information which is confidential and may be subject to legal privilege. If you are not the intended recipient, you must not pursue use, distribute or copy this email or attachments. If you have received this in error please notify the sender and delete.

From: John Thompson-Harawira <jtdesigns2015@xtra.co.nz>

Sent: Thursday, 16 January 2025 2:15 PM

To: Craig Manktelow <craig@mcel.co.nz>

Subject: 116 Richard Street

Hi Craig,

can you confirm that the subfloor bracing calculations for 116 Richard Street are part of what you supplied?

Or did I need to do a subfloor calculation based on 6kn cantilevered piles?

Your info attached

On 15/01/2025 11:07 NZDT Craig Manktelow <craig@mcel.co.nz> wrote:

Tēnā koe (Hi) John,

See attached requested with specs attached.

Nga mihi (Kind Regards)

Craig Manktelow

Engineering Manager | Chartered Engineer

MANKTELOW CONSULTING ENGINEERS

1st Floor, 240 The Strand

P.O. Box 474, Whakatane 3158, NZ

Ph. 073072002 **Mob.** 0276125548

Email craig@mcel.co.nz **Website** www.mcel.co.nz

This email contains information which is confidential and may be subject to legal privilege. If you are not the intended recipient, you must not pursue use, distribute or copy this email or attachments. If you have received this in error please notify the sender and delete.

From: John Thompson-Harawira <jtdesigns2015@xtra.co.nz>

Sent: Wednesday, 15 January 2025 10:02 AM

To: Craig Manktelow <craig@mcel.co.nz>

Subject: COULD YOU STAMP THIS PLAN PLEASE

Hi Craig, council have come back and said this plan below which is page 16 in your report, doesn't match my drawing (attached)

I have attached your report for reference

Are you able to stamp and send me back report please

Cheers

