



**ISP CONSULTING
ENGINEERS LTD**

Civil & Structural
Seismic Risk Analysis
Building Compliance

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Structural Calculations

For

Foundation Strengthening – Block O St. Mary's School, Blenheim

These calculations are in accordance with:

AS/NZS 1170:2004 Structural Design Actions
NZS 3604:2011 Timber Framed Buildings

Engineer:	Initials:
Hugh Falkner	HAF
Geert van de Vorstenbosch	GV

Preamble:

The sub-floor bracing capacity of the lightweight timber framed school Block O has been assessed as being 20% NBS (refer ISP Consulting Engineers Ltd's report dated 29 October 2012). This is due to presence of a mix of braced and shallow cantilever piles (both in accordance with NZS 3604:1990).

Proposed strengthening involves replacing 30 of the existing piles to the perimeter of the building with 30 Anchor piles in accordance with NZS 3604: 2011.

30 Anchor piles provides $30 \times 120\text{BU's/anchor pile} = 3,600\text{BU's} > 3,583\text{BU's}$ required in each direction at subfloor level.

Date:
19 March 2013

Job No.
25078



ISO 9001

Date

19 MAR 2013

Eng.

GV

Job No. 25078

Sheet No. 1

Project

St. Marijs, Blenheim - Block D Foundation Strengthening



From ISP (J24759) report, Block D sub-floor has 20% NBS due to presence of shallow cantilevered piles.

Strengthening proposed is to replace exterior piles with anchor piles (sub-floor too low for braced piles).

Reigid bracing to subfloor = 3583 BLUs. Inert direction currently have 808 ALONG & 678 ACROSS

∴ require a further 2775 ALONG & 2905 ACROSS
 ||| |||
 24 Anchor piles 25 Anchor piles

If replace all exterior piles with anchor piles, lose

9 braced piles + 5 shallow cantilever piles ALONG = 258 BLUs, and

13 braced piles + 5 shallow cantilever piles ACROSS = 346 BLUs

∴ require $2775 + 258 = 3033 \text{ BLUs} \equiv 26 \text{ Anchor piles ALONG}$

and $2905 + 346 = 3251 \text{ BLUs} \equiv 20 \text{ Anchor piles ACROSS}$

Supply min 20 Anchor Piles to exterior

PRODUCER STATEMENT - PS1 - DESIGN

(Guidance notes on the use of this form are printed on the reverse side*)

ISSUED: ISP Consulting Engineers Ltd

TO: Catholic Schools Board Ltd – Wellington Archdiocese
(Owner / Developer)

TO BE SUPPLIED TO: Marlborough District Council
(Building Consent Authority)

IN RESPECT OF: **Foundation strengthening - Block O**
(Description of Building Work)

AT: **St. Mary's Catholic School, 3 Stephenson Street, Blenheim**
(Address)

Lots 602-604 Deeds 15, Pt Lots 406-410 Deeds 15, Pt Lot 10 DP 3

We have been engaged by the owner/developer referred to above to provide **structural design services and construction monitoring of specifically designed elements** in respect of the requirements of Clause B1 (B2 of specifically designed elements) of the building code for

☐

All

☒**Part only as specified of building work:**

- Foundation seismic strengthening

The design carried out by us has been prepared in accordance with Compliance Documents issued by Department of Building & Housing B1, VM1

The proposed building work covered by this producer statement is described on the drawings titled **Foundation Strengthening – Block O, St. Mary's School, Blenheim** and numbered **SK1**.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions: Bearing capacity of excavated foundations to satisfy the requirements of NZS3604:2011.
- (ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided will comply with the relevant provisions of the Building Code and b), the persons who have undertaken this design work have the necessary competency to do so.

I, John O'Hagan am CPEng #179947

I am a member of: IPENZ and hold the following qualifications: BE(Hons), NZCE(Civil), MIPENZ, CPEng

The design firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$ 200,000*.

The Design Firm is a member of ACENZ

SIGNED BY John O'Hagan ON BEHALF OF ISP Consulting Engineers Ltd

Date 26 March 2013

(Signature).....

Note: this statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provide to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000*. This form is to accompany Form 2 of the Building (Forms) Regulations 2004 for the application of a Building Consent.

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1992. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suite of producer statements has been revised as at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

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

- PS1 Design** Intended for the use by a suitably qualified independent 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 design 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 3910:2003¹ ; or Schedules E1/E2 of NZIA's SCC 2007²
- PS4 Construction Review** Intended for use by a suitably qualified independent design professional who undertakes 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 ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design 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 designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence-based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ) or the New Zealand Institute of Architects (NZIA) provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

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

Professional Indemnity Insurance

As part of membership requirements, ACENZ 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, small projects. If the parties deem this inappropriate for large projects the minimum may be up to \$500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-5)³ (OL1-OL4)². The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities 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 as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

- 1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2003
- 2 NZIA Standard Conditions of Contract SCC 2007 (1st edition)
- 3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)

www.acenz.org.nz
www.ipenz.org.nz
www.nzia.co.nz

Date 26-03-2013

Eng. GU

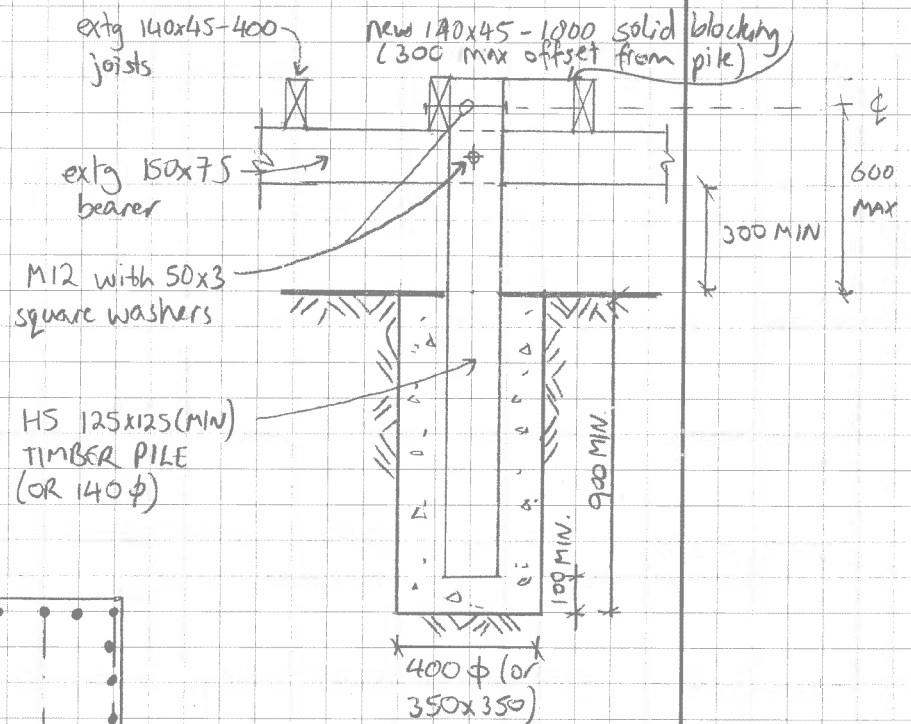
Job No. 25078

Sheet No. SK1

Project

FOUNDATION STRENGTHENING - BLOCK O

ST. MARY'S CATHOLIC SCHOOL, 3 STEPHENSON ST., BLENHEIM



ANCHOR PILE DETAIL
1:20

Key

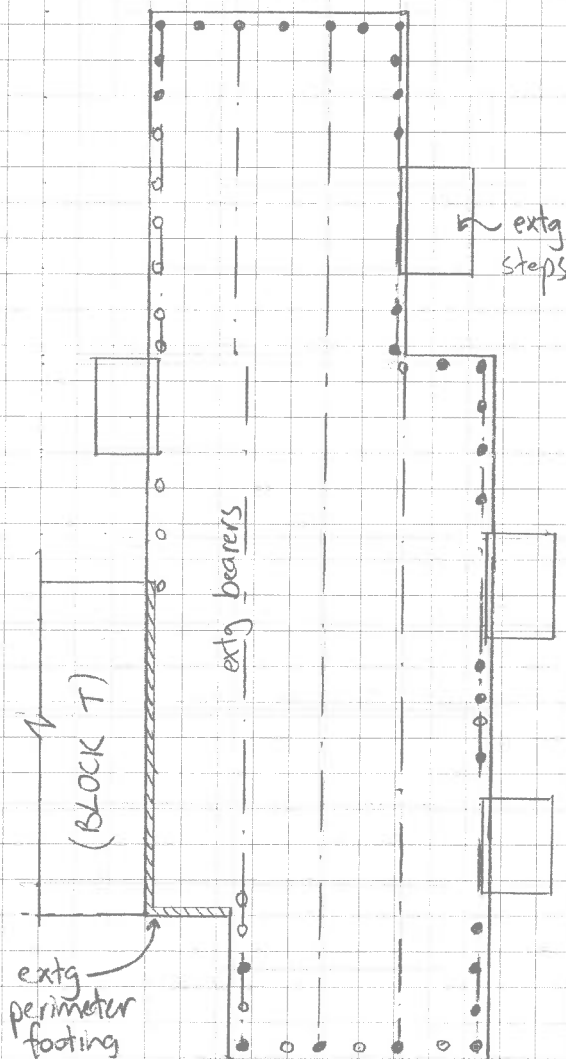
○ extg piles to remain

● new anchor piles in accordance with NZS 3604:2011

(internal piles not shown)

NOTES:-

1. ALL CONNECTORS TO BE GALVANISED
2. CONCRETE TO HAVE 28-DAY COMPRESSIVE STRENGTH OF 25 MPa



PILE LAYOUT PLAN
1:200