

Agreement to provide a producer statement during construction



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

I, Agent	being the owner / agent, confirm that I have engaged, the person named below (the author), to be responsible for construction or observation of construction (as described below)		
Name	Bernie Kose	Role	Designer
Building consent number (if known)	ABA-1014136		
Address of project:	1332 Sandspit Road Sandspit Warkworth		
Construction (description of work, which is the subject of this producer statement):	If more than one producer statement is required, please complete the back of this form. Producer Statement Construction Review (PS4) is to be submitted by Hutchinson Consulting Engineers for the observation of the construction of the Foundations, Masonry walls and Roof Beam		
Agent signature:		Date:	15/02/13
Producer statement author's name:	Ian Hutchinson	Date:	15/02/13
Approved author number:	CPEng 63973	Type:	PS4

Advice 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 order for a building consent to be granted and issued, Council must be satisfied that the construction works will be properly inspected and monitored. In some instances, building work that is specifically designed and/or construction is of a specialist nature may require specialist supervision. Where these elements are identified, the design professional and/or constructor 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 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.

Producer statement construction review (PS4)

Where a PS4 is to be provided, the owner / applicant is responsible for ensuring the author is on Council's Approved Author Register (refer to Council's website for a copy of the register).

Producer statement construction (PS3)

PS3's are slightly different because Council usually undertakes an inspection on this work, in this instance, the person providing the statement does not need to be registered. However, if Council accepts that an inspection is not required in relation to the work, the author must be registered in order for Council to accept the statement.

Please complete this section when there are multiple producer statements to be provided during construction:

[illegible]

Agreement to provide a producer statement during construction

Auckland Council
Te Kaitiaki o Tāmaki Makaurau



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

1. AGENT		being the owner / agent, confirm that I have engaged, the person named below (the author), to be responsible for construction or observation of construction (as described below)	
Name	BERNIE KOSE	Role	DESIGNER
Building consent number (if known)	ABA - 1014136		
Address of project:	1334 Sandspit Road, Sandspit		
Construction (description of work, which is the subject of this producer statement):	If more than one producer statement is required, please complete the back of this form. See page 2.		
Owner / Agent signature:		Date:	19/04/13
Producer statement author's name:	IAN HUTCHINSON	Date:	19/04/13
Approved author number:	CPENG *63973	Type:	☒ PS3 ☐ PS4

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Please complete this section when there are multiple producer statements to be provided during construction:

Construction (description of work)	Producer Statement Authors name	Approved author number	Type (PS3 or PS4)
Geotechnical Producer Statement (PS4) Producer Statement Construction Review (PS4) is to be submitted by Hutchinson Consulting Engineers for the observation of building platform earthworks and preparation (including excavation and hard-filling operations), and excavations for foundations, with certification that these meet the requirements and/or recommendations of the report by Hutchinson Consulting Engineers, referenced as LJ15567 and dated 24 July 2012.	IAN HUTCHINSON	63973	PS4
Construction Producer Statement (PS3) Mechanical Ventilation Producer Statement Construction (PS3) is to be submitted by contractor for the construction / installation of the mechanical ventilation and certification that those comply with the design as approved in this building consent.			PS3
Energy Works Certificate – Electrical (Producer Statement) Provide an Energy Works Certificate, to certify that all electrical installations meet the requirements of Clause G9 (Electricity) of the New Zealand Building Code and the acceptable solutions.	MARK MUNRO	EQ458	PS3
Energy Works Certificate – Gas (Producer Statement) Provide an Energy Works Certificate, to certify that all Gas installations meet the requirements of Clause G11 (Gas as an Energy Source) of the New Zealand Building Code and the acceptable solutions.	ARON JONES	13851	PS3

PRODUCER STATEMENT – PS1 – DESIGN

ISSUED BY: **IAN HUTCHINSON CONSULTANTS LTD**
(Design Firm)

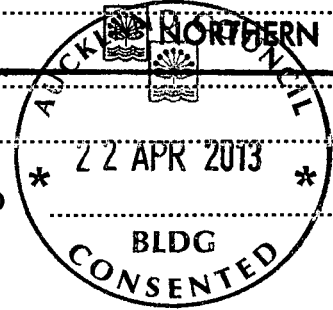
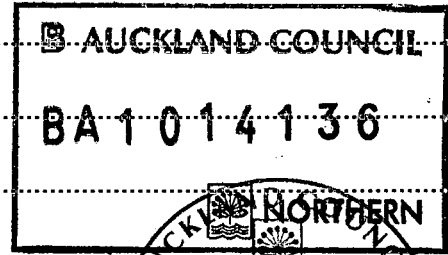
TO: **B & V MORRISON**
(Owner / Developer)

TO BE SUPPLIED TO: **AUCKLAND COUNCIL**
(Building Consent Authority)

IN RESPECT OF: **PROPOSED ABLUTION BLOCK**
(Description of Building Work)

AT: **1336 SANDSPIT ROAD**
SANDSPIT
(Address)

LOT **202** DP **94165** SO



have been engaged by the owner/developer referred to above to provide:
SPECIFIC STRUCTURAL DESIGN COMPUTATION services in respect of the requirements of
(Extent of Engagement)

Clause(s) **B1 (VM1) (VM4) (AS1)** of the Building Code for

☐ All ☒ Part only (as included in the Design Calculations, ref **16136**, dated **MARCH 2013**),

of the proposed building work. The design carried out by us has been prepared in accordance with:

☒ Compliance Documents issued by Department of Building & Housing **B1 (VM1) B1 (AS1) B1 (VM4)**
(verification method / acceptable solution)
 or
☐ Alternative solution as per the attached schedule

The proposed building work covered by this producer statement is described on the drawings titled
BK DESIGN – SANDSPIT HOLIDAY PARK and numbered **1-23**
 together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions **GROUND CONDITIONS IN ACCORDANCE WITH GEOTECHNICAL REPORT BY HUTCHINSON REF LJ15567 DATED 24 JULY 2012**
- (ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds 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.

I, **IAN THOMAS HUTCHINSON** am: ☒ CPEng # **63973** ☐ Reg Arch

I am a Member of: ☒ IPENZ ☐ NZIA

and hold the following qualifications: **BE ME MIPENZ (Civil Structural) CPEng IntPE(NZ)**

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 ☒ Yes ☐ No

SIGNED BY **Ian T Hutchinson** ON BEHALF OF **IAN HUTCHINSON CONSULTANTS LTD**

Date **5 March 2013**

Signed _____

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 from this statement and all other statements provided 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 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 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 3910:2003 or Schedules E1/E2 of NZIA's SCC 2007²

PS4 Construction 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 (CM1CM5)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





SPECIFIC ENGINEERING DESIGN CALCULATIONS

PROJECT DETAILS:

PROJECT: Proposed Ablution Block

CLIENT: B & V Morrison

SITE: 1334 Sandspit Road

Sandspit

ARCHITECT: BK Design

JOB REF: 16136

DATE: 05 March 2013

BY: Rohann Da Silva

B AUCKLAND COUNCIL

BA 1 0 1 4 1 3 6



NORTHERN



DESIGN SUMMARY:

- Specific design of structural elements outside the scope of NZS3604:2011
- Bracing calculations in accordance with AS/NZS 1170
- Foundation design in accordance with geotechnical report by Hutchinson ref LJ15567 dated 24 July 2012



COPYRIGHT:

This specific design engineering calculations is the exclusive property of **Hutchinson** and is licensed to the Client for use on this project.

Reproduction of this document for this project shall only be undertaken in full. Reproduction for other purposes without the permission of **Hutchinson** is prohibited.

GENERAL SPECIFICATION

BRIEF OUTLINE OF STRUCTURAL REQUIREMENTS / SPECIFICATIONS

1.0 GENERAL

Engineering details are to be read in conjunction with all other relevant documentation.

Do not scale any drawings. For setting out information refer to Architect's documentation.

The contractor is to ensure temporary stability of the building and ground at all times. Any temporary loading conditions imposed by the construction techniques are to be checked by the contractor.

All workmanship and construction practice is to be to the latest editions of NZ Standards (and other relevant standards).

All work is to be carried out to the NZ Building Code and any Territorial Authority requirements.

Any engineering discrepancies should be immediately referred to the Engineer for resolution.

For any nominated products, acceptable alternative products may be submitted by the Contractor for approval.

Contractor and fabricators shall confirm all dimensions prior to commencement of work. Discrepancies, if found, shall be brought to the immediate attention of the Architect.

ABBREVIATIONS

UB	Universal Beam e.g. a 250UB 31.4 is a 252x146 'I' beam and weighs 31.4kg per metre
TFB	Tapered Flange Beam e.g. 125TFB 13.1
UC	Universal Column e.g. a 200UC 46.2 is a 203x203 'I' beam and weighs 46.2kg per metre
EA	Equal Angle e.g. 50x50x6 EA has 6mm thick sides
UA	Unequal Angle e.g. 125x75x10 UA
CHS	Circular Hollow Section e.g. 102x8.6 CHS has an 8.6mm wall thickness
SHS	Square Hollow Section e.g. 89x89x3.6 SHS has 3.6mm wall thickness
RHS	Rectangular Hollow Section e.g. 89x38x4.0 RHS
PFC	Parallel Flange Channel e.g. 200PFC is a 200x75 channel
P/C	Pre-camber
PL	Steel Plate
MSG	Machine Stress Graded timber in accordance with AS/NZ 1748, available in grade 6, 8, 10, 12 and 15
VSG	Visual Stress Graded timber in accordance with NZS 3622:2004, available in grade 8 and 10.
G	Only available in G8, verified green timber, typically used in wet service situations
GL	Glulam Timber
c/c	Centre to centre distance (also CTRS)

2.0 DESIGN LOADS

All loads have been calculated in accordance with AS / NZS 1170, and structural elements designed for the following loads.

2.2 Dead Loads

ELEMENTS	LOADINGS kPa (Plan area)
Timber Floors	0.5
Timber Decks	0.5
Heavy/Light Roof	0.85/0.45

ELEMENTS	LOADINGS kPa (Face area)
Timber Framed walls	0.5
Timber Framed walls + brick veneer	2.1
20/25 Series Masonry	4.1/5.1

2.3 Imposed Loads

Elements	LOADINGS	
	Udl Q_b kPa	Pt Loads Q_b kN
All Floors	1.5	1.8
Decks	2.0	1.8
Roof	0.25	1.4

2.4 Specific Loads

The following specific loads have been allowed for: Nil.

3.0 SITE WORKS – GENERAL

- 3.1 Origin of levels is the LINZ datum – refer to Survey drawings.
- 3.2 All drawings to be read in conjunction with the specification.
- 3.3 Existing services are shown indicatively only. Before construction commences, it is the contractor's responsibility to locate the position and depth of all services that could be adversely affected by their operations. Inform Architect of any variations.
- 3.4 All work to be in accordance with the Territorial Authority standards.
- 3.5 Concrete for site works only to be 10MPa unless noted otherwise.
- 3.6 Catchpit positions and grate levels are approximate. Final positions are to suit kerb levels.
- 3.7 All work on public drains is to be carried out by an approved licensed drain layer, to the relevant Territorial Authorities' standards.

3.0 SITE WORKS – EARTHWORKS

- 4.1 Temporary batters to have a 1V:1H maximum slope, but also refer to any specific requirements in the geotechnical report.
- 4.2 Work to include the stripping of vegetation, topsoil, and any surface deleterious matter. This includes the breaking out of substructures and hard paving where required.
- 4.3 Care is to be exercised adjacent to existing trees that are to be retained. Any excavations shall be performed by hand in the vicinity of existing trees.
- 4.4 The subgrade shall be inspected by the Engineer and proof rolled as necessary. Any soft spots shall be over-excavated and compacted back to level with imported GAP65 material.

5.0 FOUNDATIONS

- 5.1 Unless noted otherwise, foundations have been designed to the requirements of NZS 3604 2011 for:
 - 100kPa safe bearing capacity (under unfactored loads).
 - 150kPa dependable bearing capacity (under factored loads).
- 5.2 All founding material is to be approved by the Engineer before any concrete, including blinding concrete, is placed. Note that all footings are to be founded in original ground. Refer also to the requirements of any specific Geotechnical Report.
- 5.3 No services excavations shall be formed within a 1:1 line of the underside of any foundation unless specifically instructed by the Engineer.
- 5.4 Slabs on grade are to be constructed onto prepared basecourse.
- 5.5 All backfill behind retaining walls, if any, is to be of approved free-draining material. Drain coils are to be fitted to drain, to approved silt traps.

6.0 REINFORCED CONCRETE

- 6.1 Minimum 28 day compressive concrete strengths to be as follows:

ELEMENT	GRADE (MPa)
Footings	20
Floor slabs	20

- 6.2 Concrete sizes indicated on the drawings do not include the thickness of applied finishes. Chamfers to be formed on all exposed corners, generally 15mm x 15mm.

- 6.3 Sizes indicated show depth x width for beams. Depth excludes depth of slab unless noted otherwise.
- 6.4 If construction joints are not shown, their location shall be the contractor's responsibility to suit the conditions of the design. The Contractor is to allow for all construction joints necessary to complete the work, without causing distress to the structure. Location to be agreed with Engineer. In general, for slabs on grade, saw cuts (30mm deep x 3mm wide) are to be formed to produce a grid of 5.0m x 5.0m maximum, after the initial cure (approximately 3 days after the construction of the slab).
- 6.5 All penetrations are to be located to the written approval of the Engineer and as shown on the drawings. Services to be cast in where shown.
- 6.6 Ensure adequate gaps maintained between suspended concrete work and all non-structural elements.
- 6.7 Finish to concrete to be as follows:

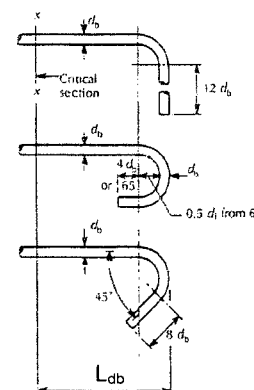
ELEMENT	TYPE OF FINISH (to NZS 3411)
Walls and all exposed concrete faces	F5 with special features – see Architects drawings
Floor slab	U3 for application of floor finish – see drawings

- 6.8 For all proprietary concrete materials, full calculations and shop drawings are to be submitted in adequate time by the Contractor. These are to show full compliance with the design intent. Where necessary this documentation is to be submitted to the Territorial Authority for the necessary Building Consents.

7.0 REINFORCEMENT

Hook definitions;

- A 90° turn plus an extension of at least 12 bar diameters at the free end of the bar
- A semi-circular turn plus an extension of at least 4 bar diameters but not less than 65mm at the free end of the bar
- A stirrup hook, which is defined as a 135° turn around a longitudinal bar plus an extension of at least 8 stirrup bar diameters for plain bars and 6 stirrup bar diameters for deformed bars at the free end of the bar embedded in the core concrete of the member



Minimum lap length as follows:

- Masonry lap lengths;
 - Grade 300 reinforcing = 40 x bar diameter
 - Grade 500 reinforcing = 70 x bar diameter
- Concrete lap lengths;

$$L_{db} = \frac{(0.5 \alpha_a f_y) d_b}{\sqrt{f'_c}}$$

Where $\alpha_a = 1.3$ for top reinforcement where more than 300mm of fresh concrete is cast in the member below the bar, or 1.0 for all other cases.

For example; ($\alpha_a = 1.0$)

Concrete Strength	Steel Strength	Lap length required
20MPa	300MPa	34 x d_b
20MPa	500MPa	56 x d_b
25MPa	300MPa	30 x d_b
25MPa	500MPa	50 x d_b
30MPa	300MPa	28 x d_b
30MPa	500MPa	46 x d_b

Minimum bend diameters of Class E steel bars, with yield strength 300MPa or 500MPa

- Normal
 - Bar diameter (d_b) 6-20mm = $5d_b$
 - Bar diameter (d_b) 24-32mm = $6d_b$
- Stirrups or ties
 - For **deformed** bars:
 - Bar diameter (d_b) 6-20mm = $4d_b$
 - Bar diameter (d_b) 24-32mm = $6d_b$
 - For **plain** bars:
 - Bar diameter (d_b) 6-20mm = $2d_b$
 - Bar diameter (d_b) 24-32mm = $3d_b$

For example;

Bar Diameter	Type	Required Bend Diameter (d_b)
R6	Stirrup or tie	12mm
R10	Stirrup or tie	20mm
D10	Stirrup or tie	40mm
D10/H10	Normal	50mm
D12	Stirrup or tie	48mm
D12/H12	Normal	60mm
D16/H16	Normal	80mm
D20/H20	Normal	100mm
D24/H24	Normal	144mm
D32/H32	Normal	192mm

Minimum cover to reinforcement:

a. Masonry:

Exposure Classification	Minimum cover (mm)
Coastal Frontage*	60
Coastal Perimeter	50
External (inland)	45
Closed interior	35

b. Concrete:

Exposure Classification	Concrete Strength (MPa)				
	17.5	20	25	30	40
	Minimum cover (mm)				
Closed Interior	30	25	25	20	20
External (Inland)	50	40	35	30	25
Coastal Perimeter	65	50	40	35	30
Coastal Frontage*	-	-	50	45	40
Cast against Ground	75	75	75	75	75
Cast against Ground with DPC	50	50	50	50	50

* Within 100m of high tide mark or within 500mm of high tide mark to the direction of the prevailing wind

7.1 All reinforcement shall comply with the following:

SYMBOL	TYPE
R	Structural grade plain bars to NZS 3402 (300MPa)
D	Structural grade deformed bars to NZS 3402 (300MPa)
M	Mesh to NZS 3421 (430MPa)
HD	Deformed bars grade 500 to NZS 3402 (500MPa)
HR	Plain bars grade 500 to NZS 3402 (500MPa)

7.2 Minimum distribution steel shall be D12 at 300 centres.

7.3 No splicing of reinforcement unless specifically shown. Laps to be to NZS 3109. Mesh lap to be one mesh + 25mm.

7.4 Adequate support to all reinforcement to be made by the use of spacers, stools and the like.

7.5 All bending of reinforcement to be to NZS 3109.

7.6 Notation used for reinforcement fixing:

B/W	Both ways
B/F	Both faces
E/F	Earth face
V	Vertical
H	Horizontal
N/F	Near face
BOT	Bottom
ABR	Alternative bars reversed

8.0 STRUCTURAL TIMBER

8.1 Timber beams shall be propped until dry to prevent premature creep.

8.2 All normal timber sizes given are nominal dimensions unless otherwise stated.

8.3 All glue laminated timber sizes are actual dimensions.

8.4 Timber treatment shall be specified and shall comply with the recommendations of the Timber Preservation Authority. Generally all timber to be treated to the requirements of the Building Code. Refer to Architects drawings / specifications.

Hazard	Hazard Class	Examples
Low	H1.1	Interior linings, internal wall
	H1.2	Wall framing, skillion roof framing
Moderate	H3.1	Claddings, fascia, wall framing
	H3.2	Deck bearers, joists, boards
High	H4	Fence posts, landscaping timber
Severe	H5	House piles, retaining walls
Marine	H6	Marinas, wharf piles

8.5 All structural timber to be machine gauged MSG8 Pinus Radiata unless noted otherwise.

Generally, unless noted otherwise, all horizontal framing (e.g. beams, lintels, flitch beams, joists, rafters) and all vertical framing (e.g. studs) to be MSG8 / VSG8. MSG can be substituted with VSG as required.

8.6 Where timber connections are exposed to the weather, all steel connection shall be galvanised (unless in the sea spray zone in which case they are to be stainless steel). Faces and edges of steel elements which rest against tanalised timber shall be painted before positioning. Minimum connections are 5mm plate and 1/M16 bolts unless noted otherwise.

8.7 All bolts and nuts to have washers as the following table:

SQUARE (mm)		ROUND (mm)
25 x 25 x 1.6	M6	30 x 1.6
32 x 32 x 2.0	M8	36 x 2.0
40 x 40 x 2.5	M10	45 x 2.5
50 x 50 x 3.0	M12	55 x 3.0
57 x 57 x 4.0	M16	65 x 4.0
65 x 65 x 5.0	M20	75 x 5.0
75 x 75 x 6.0	>M20	85 x 6.0

9.0 STRUCTURAL STEELWORK

Steelwork drawings show the design intent. The Contractor is to prepare shop drawings for review. No fabrication is to commence until shop drawings are reviewed and written notification issued.

9.2 All reactions are shown in kN.

9.3 Confirm HD bolts on site as constructed before fabrication.

9.4 All protective coatings to steelwork to be in accordance with the architectural specifications. Generally, all exposed structural steel is to be galvanised, unless noted otherwise. All external flitch beams are to have plates galvanised and top, bottom and side edges full sealed.

9.5 All steelwork beams, girders, trusses and the like are to be precambered to compensate for the effects of dead load deflection as noted on the drawings.

9.6 Where the weight of a steel section is omitted the heaviest steel section shall be utilized.

9.7 All bolts to a minimum of M12 and all welds to be a minimum of 6mm continuous fillet (SP).

9.8 All beam connection plates to be a minimum thickness of 10mm. All other plates to be a minimum thickness of 6mm. All cap plates to be a minimum thickness of 3mm. All hollow sections to be sealed with cap plates.

9.9 M12 bolts where specified to the grade 4.6S. All other bolts to be grade 8.8S, unless noted otherwise.

9.10 All HD bolts to be fabricated from material with a minimum yield stress of 250MPa, set to template, checked for level and position before casting. All grout under base plates to have a compressive strength of at least 25MPa. All bolts to be galvanised.

9.11 All nuts and turning bolts are to have approved washers. All exposed nuts, bolts and washers to be galvanised and to have protective coatings to match general steelwork, unless noted otherwise.

9.12 All cold formed sections, including cold rolled purlins to be to AS 1538. To be formed from zinc coated high strength steel strip with a minimum yield stress of 450MPa. All to be galvanised with a minimum coating of 300g/m². All purlin connections to be to manufacturer's recommendations.

9.13 All rod bracing to be a minimum of grade 300 plain reinforcing bar, unless noted otherwise.

9.14 Steel members shall be to the following grades, unless noted otherwise.

Member	Grade
UB, UC, TFC, PFC, TFB, Angles	300+
RHS, SHS, CHS	350
WB, WC	300+
Stainless steel	250+ (grade 315L)

- 9.15 All sealed sections to be galvanized shall have vent holes. To be shown on shop drawings.
- 9.16 Purlin cleats are to be in accordance with the manufacturer's standard details except where the top flange of the purlin is more than 300mm above supporting steelwork 75 x 75 x 8 angle cleats shall be used. Purlins shall be fixed using approved flanged bolts and washers.
- 9.17 Ceiling systems, ductwork, etc. to be suspended from purlins should be fixed with hook bolts through purlin web. The flanges of the purlins or girts shall not be holed.

10.0 REINFORCED MASONRY

- 10.1 Generally all concrete block masonry construction to be in accordance with NZS 4229:1999, and NZS 4210:2001.
- 10.2 Refer to figure 8.1, NZS 4229:1999 for D16 Trimmers around openings.
- 10.3 The top of all the concrete block walls to be continuous Bond Beam B1 of B2, as per figure 10.1 and 10.2, NZS 4229:1999. Continuous Bond Beam type B3 (figure 10.2, NZS 4229:1999) to be provided at mid-floor level of 2 storey walls.
- 10.4 Minimum reinforcing to be as follow unless shown otherwise:

Bond	15 Series		20 Series	
	Vertical	Horizontal	Vertical	Horizontal
Running	D12@800crs	D12@800crs	D12@600crs	D12@600crs
Stack	D10@400crs	D10@1000crs	D12@400crs	D12@400crs

- 10.5 In general only load bearing masonry is shown on the structural drawings. All non-load bearing masonry is to be separated from structure by a 12mm compressible joint. All load bearing masonry, including retaining walls, shall be a minimum of Grade B.
- 10.6 Concrete blocks shall have a minimum compressive strength of 12.5MPa, to NZS 4210. Density to be greater than 1750kg/m³.
- 10.7 Mortar shall comply with the requirements of NZS 4210 to a nominal mix of:
1 part cement / 3 parts sand / ½ part lime.
- 10.8 All cores with reinforcement to be grout filled as a minimum. Additional covers filled as noted on the drawings. Grout shall have a slump of 230mm and a compressive strength of 17.5MPa.
- 10.9 In general, walls to be full height before grouting cores. Cleanout openings to be provided at bottom course (1.2m centres maximum). Mortar joints to be 10mm thick with blocks fully bedded and perpends filled. Joints to be tooled at exposed or rendered surfaces.
- Before placing vertical reinforcement, cores are to be cleaned of all mortar fins and droppings through cleanout openings which are not to be closed until inspected by Engineer.
- Grout to be added to ensure fill of cores with a maximum continuous pour height of 3600mm.
- 10.10 No construction of masonry on suspended floors is to take place until floor is fully depropped.
- 10.11 All Grade A masonry to be supervised by a registered mason, including grouting. All masonry to be inspected by Engineer prior to grouting.
- 10.12 Chasing of load bearing masonry only permitted as shown on Engineer's drawings.

These calculations and associated sketches have been prepared using the information supplied by the client at the time of engagement. Ian Hutchinson Consultants Limited take no responsibility for any discrepancies in the information supplied or any subsequent changes made without their knowledge. The calculations are solely for the benefit of the client and the appropriate Territorial Authority. No responsibility is taken for use by other parties without prior arrangement.

in accordance with AS/NZS 1170.2 2002

Building Importance: 2 *Normal Structures and structures not falling into other levels*
 Design life: 50 years
 Probability of Exceedance: 1/500 (Ultimate) 1/25 (servicability)

Wind Region = A6 Rodney District

Site wind speed

$$V_{(site,\beta)} = V_R M_d \{M_{z\ cat} M_s M_t\}$$

ULTIMATE LIMIT STATE
SERVICABILITY LIMIT STATE

Regional wind speed

$$V_{500} = 45 \text{ m/s}$$

$$V_{25} = 37 \text{ m/s}$$

Direction multiplier

$$M_d = 1.00$$

$$M_d = 1.00$$

Terrain category (1 - 4)

$$= 2$$

$$= 2$$

Building height

$$= 4.6 \text{ m}$$

$$= 4.6 \text{ m}$$

Terrain/height multiplier

$$M_{(z\ cat)} = 0.91$$

$$M_{(z\ cat)} = 0.91$$

Shielding multiplier

$$M_s = 1.00$$

$$M_s = 1.00$$

Elevation above mean sea level

$$E = 0 \text{ m}$$

$$E = 0 \text{ m}$$

Topographic multiplier

$$M_t = 1.00$$

$$M_t = 1.00$$

Hill-shape multiplier

$$M_h = 1.00$$

$$M_h = 1.00$$

Lee multiplier

$$M_{lee} = 1.00$$

$$M_{lee} = 1.00$$

(site not in lee zone refer to figure 3.1(b) AS/NZS 1170.2:2002)

Site wind speed

$$V_{(site,\beta)} = 41.0 \text{ m/s}$$

(High)

$$V_{(site,\beta)} = 33.7 \text{ m/s}$$

Design wind speed

$$= V_{(des,\theta)}$$

Design wind pressure

$$\rho_u = (0.5\rho_{air})\{V_{(des,\theta)}\}^2 C_{fig} C_{dyn}$$

$$C_{dyn} = 1.00$$

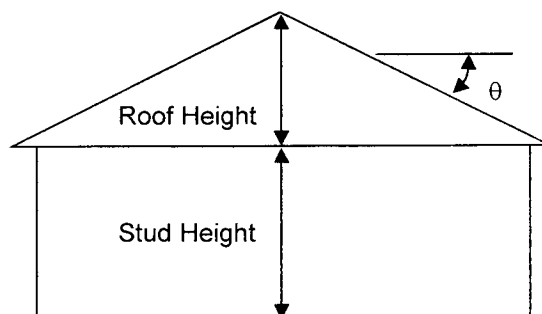
$$= 1.01 \text{ kPa}$$

$$\times C_{fig}$$

$$\rho_s = 0.68 \text{ kPa}$$

Design force on building

$$F = \Sigma(\rho_z A_z)$$

BUILDING DIMENSIONS

 Roof Pitch, $\theta = 45^\circ$

Roof Height = 3.7 m

Stud Height = 2.7 m

 Building Breadth, $b = 12.0 \text{ m}$

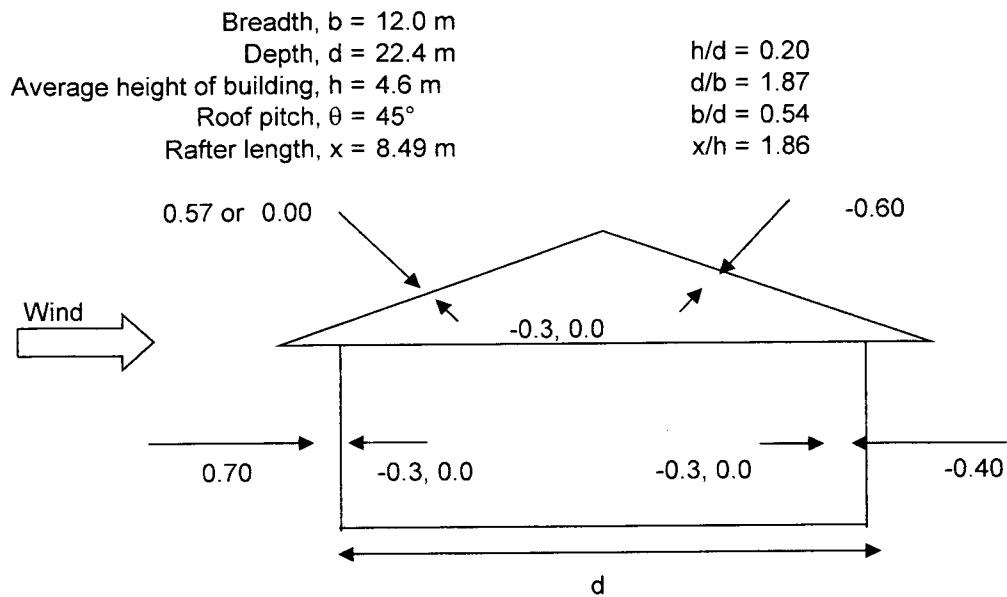
 Building Depth, $d = 22.4 \text{ m}$

(Varies with wind direction)

(Varies with wind direction)

ALONG-WIND AERODYNAMIC SHAPE FACTOR

Internal and external pressure coefficients, $C_{p,i}$ & $C_{p,e}$:



$$C_{fig} = (C_{p,e} + C_{p,i}) \times K_c$$

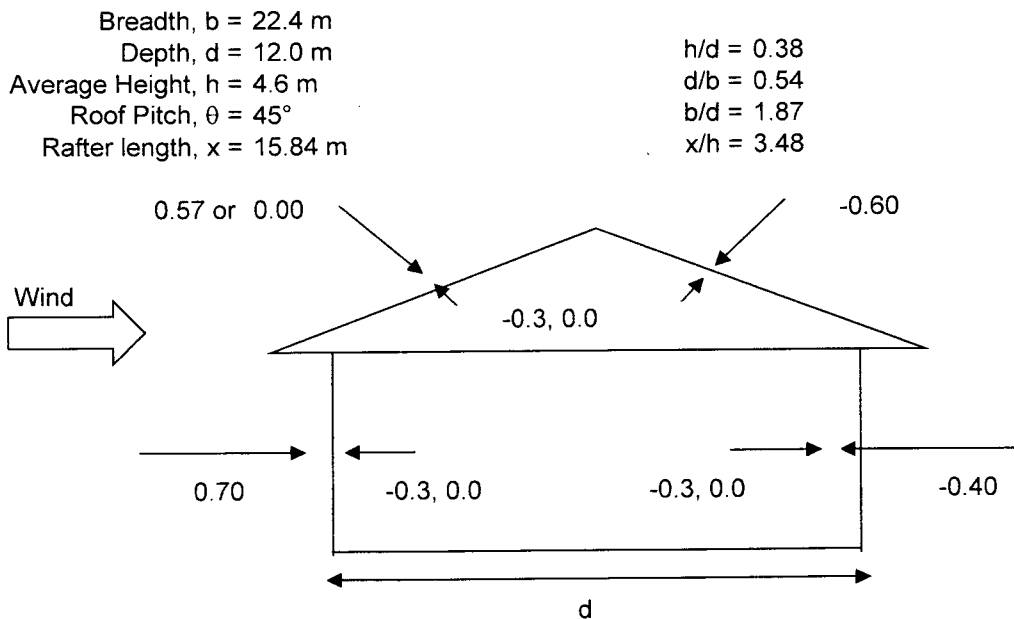
Action combination factor, $K_c = 0.80$

$$C_{fig \text{ roof}} = 0.93$$

$$C_{fig \text{ wall}} = 0.88$$

CROSSWIND AERODYNAMIC SHAPE FACTOR

Internal and external pressure coefficients, $C_{p,i}$ & $C_{p,e}$:



$$C_{fig} = (C_{p,e} + C_{p,i}) \times K_c$$

Action combination factor, $K_c = 0.80$

$$C_{fig \text{ roof}} = 0.93$$

$$C_{fig \text{ wall}} = 0.88$$

BRACING DEMAND

Horizontal design force on building, $F = \Sigma(\rho_z A_z)$

$$F = \Sigma(\rho_u \times A_{\text{wall}} \times C_{\text{fig wall}} + \rho_u \times A_{\text{roof}} \times C_{\text{fig roof}} \times \sin\theta)$$

ALONG-WIND DIRECTION:

$$F = 56.0 \text{ kN} \times 20 = 1125 \text{ BU's}$$

CROSSWIND DIRECTION:

$$F = 104.5 \text{ kN} \times 20 = 2095 \text{ BU's}$$

Along-Wind Bracing Demand = 1125 BU's
Crosswind Bracing Demand = 2095 BU's

in accordance with NZS 1170.5:2004

 Lateral force coefficient, $C(T) = C_h(T) Z R N(T,D)$
ULTIMATE LIMIT STATE
SERVICABILITY LIMIT STATE

Structural ductility factor	$\mu = 3$	$\mu = 1$
Site subsoil class	= C Shallow soil site	= C
Period	< 0.40 s	< 2.00 s
Hazard factor	$Z = 0.13$ (table 3.3)	$Z = 0.13$
Return period factor	$R_{(1/500)} = 1.00$ (table 3.5)	$R_{(1/25)} = 0.25$
Near-fault factor	$N(T,D) = 1.00$	$N(T,D) = 1.00$
Basic acceleration hazard	$C_h = 2.36$	$C_h = 0.66$
Lateral force coefficient	$C(T) = C_h(T) Z R N(T,D)$ = 0.31	$C(T) = C_h(T) Z R N(T,D)$ = 0.02
Structural performance factor	$S_p = 0.70$	$S_p = 0.70$
Inelastic spectrum scaling factor	$k_\mu = 2.1$	$k_\mu = 1.0$
Horizontal design action coefficient	$C_d(T_1) = C(T_1) S_p / k_\mu$ = 0.10	$C_d(T_1) = C(T_1) S_p / k_\mu$ = 0.02

$$V = C_d(T_1) W_t$$

$$= 96.6 \text{ kN}$$

$$W_t = 964.1 \text{ kN}$$

$$W_i h_i = 2603.1 \text{ kNm}$$

GROUND FLOOR DEAD LOADS

Timber Deck:	$0.50 \text{ kPa} \times 148.5 \text{ m}^2 = 74.25$
Roof:	$0.55 \text{ kPa} \times 278.7 \text{ m}^2 = 153.3 \text{ kN}$
SDL	$0.25 \text{ kPa} \times 278.7 \text{ m}^2 = 69.7 \text{ kN}$
Masonry walls	$4.40 \text{ kPa} \times 148.5 \text{ m}^2 = 653.4 \text{ kN}$
External Timber Framed Walls:	$0.50 \text{ kPa} \times 27.0 \text{ m}^2 = 13.5 \text{ kN}$
	$\Sigma G = 964.1 \text{ kN}$

GROUND FLOOR LIVE LOADS

Roof:	$0.25 \text{ kPa} \times 278.7 \text{ m}^2 = 69.7 \text{ kN}$
	$\Sigma Q = 69.7 \text{ kN}$

$$\psi_u = 0.0$$

$$\text{Ground Bracing Demand} = F_t + 0.92 V \{W_i h_i / \Sigma W_i h_i\}$$

$$= 96.6 \text{ kN}$$

$$W_i = 964 \text{ kN}$$

$$h_i = 2.7 \text{ m}$$

$$F_t = 7.7 \text{ kN (top level)}$$

Ground Bracing Demand = 1935 BU's

JOB: Morrison		
SUBJECT: TOP FLOOR BRACING		
BY: JP	DATE:	JOB NO: 16136

BRACING ALLOCATION - ALONG DIRECTION

(In accordance with NZS 4229:1999)

Masonry Series: 20 Series

Fill Type: Solid Fill

Wall or Bracing Line		Bracing Elements Provided					Earthquake		Wind	
Line Label	Minimum BU's Required	Bracing Wall No.	Bracing Type	Wall Length (m)	Wall Height (m)	Angle from Wind Direction	BU's at 0°	BU's Achieved	BU's at 0°	BU's Achieved
A	100 BUs	1	NZS 4229:1999	0.8	2.7	0	150	150	150	150
		2	NZS 4229:1999	1.4	2.7	0	265	265	265	265
		3	NZS 4229:1999	1.4	2.7	0	265	265	265	265
		4	NZS 4229:1999	0.8	2.7	0	150	150	150	150
EQ Achieved = 830 Wind Achieved = 830										
B	70 BUs	1	NZS 4229:1999	3.0	2.7	0	1080	1080	1080	1080
		2	NZS 4229:1999	1.5	2.7	0	265	265	265	265
		3	NZS 4229:1999	6.0	2.7	0	3515	3515	3515	3515
EQ Achieved = 4860 Wind Achieved = 4860										
C	70 BUs	1	NZS 4229:1999	3.2	2.7	0	1100	1100	1100	1100
		2	NZS 4229:1999	3.2	2.7	0	1100	1100	1100	1100
		3	NZS 4229:1999	1.3	2.7	0	265	265	265	265
EQ Achieved = 2465 Wind Achieved = 2465										
D	70 BUs	1	NZS 4229:1999	1.5	2.7	0	265	265	265	265
		2	NZS 4229:1999	6.0	2.7	0	3515	3515	3515	3515
EQ Achieved = 3780 Wind Achieved = 3780										
E	100 BUs	1	GS1-N	0.9	2.7	0	44	44	40	40
		2	GS1-N	2.7	2.7	0	144	144	168	168
EQ Achieved = 188 Wind Achieved = 208										

Wind_{req} / EQ_{req} 1.08

Wind and Earthquake

Achieved	EQ	12123	Wind	12143
Required	EQ	1935	Wind	2095

OK

OK

JOB		
Morrison		
SUBJECT		
TOP FLOOR BRACING		
BY:	DATE	JOB NO
JP		16136

BRACING ALLOCATION - ACROSS DIRECTION

(In accordance with NZS 4229:1999)

Masonry Series: 20 Series

Fill Type: Solid Fill

Wall or Bracing Line		Bracing Elements Provided					Earthquake		Wind	
Line Label	Minimum BU's Required	Bracing Wall No.	Bracing Type	Wall Length (m)	Wall Height (m)	Angle from Wind Direction	BU's at 0°	BU's Achieved	BU's at 0°	BU's Achieved
N	100 BUs	1	NZS 4229:1999	2.7	2.7	0	830	830	830	830
		2	NZS 4229:1999	4.4	2.7	0	2065	2065	2065	2065
		EQ Achieved = 2895								
		Wind Achieved = 2895								
O	70 BUs	1	NZS 4229:1999	6.2	2.7	0	3515	3515	3515	3515
		EQ Achieved = 3515								
		Wind Achieved = 3515								
P	70 BUs	1	NZS 4229:1999	5.2	2.7	0	2685	2685	2685	2685
		2	NZS 4229:1999	6.0	2.7	0	3515	3515	3515	3515
		EQ Achieved = 6200								
		Wind Achieved = 6200								
Q	70 BUs	1	NZS 4229:1999	6.0	2.7	0	3515	3515	3515	3515
		2	NZS 4229:1999	4.0	2.7	0	1650	1650	1650	1650
		EQ Achieved = 5165								
		Wind Achieved = 5165								
R	100 BUs									
		EQ Achieved = 0								
		Wind Achieved = 0								

Achieved	EQ	17775	Wind	17775
Required	EQ	1935	Wind	1125

OK

OK

Wind_{req} / EQ_{req} 0.58

Earthquake Bracing



Hutchinson
CONSULTING ENGINEERS

JOB:

MORRISON

SUBJECT:

Bracing Capacity

BY:

JP

PAGE:

—

DATE:

14/2/13

JOB NO:

16082

Masonry Walls provide sufficient bracing to support self weights and other loadings in their Trib widths.

Masonry wall (A) must provide $\frac{2095}{5 \times 2} = 210 \text{ BUS MIN}$

Length of wall = 1.5m

Height of wall = 2.7m

BUS provided = 287 BUS > 210 BUS OK.

Bracing Line (B) is timber, so must provide Gib Bracing.

Supports 6m of Roof; 3m of wall

Pressure resisted = $1.01 \text{ kPa} \times C_{fig}$ (assume $C_{fig} = 1$)

Wall Area = $3 \text{ m} \times 2.7 \text{ m} = 8.1 \text{ m}^2$

Roof Area = $6 \times 3 \times \frac{1}{2} = 9 \text{ m}^2$

Force resisted = $(8.1 + 9) \times 1.01 = 17.3 \text{ kN}$

Try (B1) — 1.4m of GS1-N = $70 \times 1.4 \times \frac{2.4}{2.7} = 87.1 \text{ BUS}$

(B2) — 2.8m of BL1-H = $125 \times 2.8 \times \frac{2.4}{2.7} = 311 \text{ BUS}$

Bu capacity = 398 > 345 OK

398 BUS



Hutchinson

CONSULTING ENGINEERS

JOB:

Morrison

SUBJECT:

Bearer

BY:

JP

BEAM:

Deck Bearer

DATE:

25/02/13

JOB NO:

16136

UNIFORMLY DISTRIBUTED LOADS (SIMPLY SUPPORTED):

Dead Loads, G:

roof: 0.35 kPa x 0.0 m = 0.0 kN/m
 floor: 0.50 kPa x 3.0 m = 1.5 kN/m
 internal walls: 0.35 kPa x 0.0 m = 0.0 kN/m
 external walls: 0.50 kPa x 0.0 m = 0.0 kN/m
 self weight (member) = 0.15 kN/m

G = 1.7 kN/m

Live Loads, Q:

roof: 0.25 kPa x 0.0 m = 0.0 kN/m
 external floor: 2.00 kPa x 3.0 m = 6.0 kN/m
 internal floor: 1.50 kPa x 0.0 m = 0.0 kN/m

Q = 6.0 kN/m

LOAD COMBINATIONS:

ULS Distributed Loads:

1.35G = 2.2 kN/m
 1.2G + 1.5Q = 11.0 kN/m

SLS = Serviceability Limit State
 ULS = Ultimate Limit State

Maximum ULS Distributed Load
 w = 11.0 kN/m

SLS Distributed Loads:

G + ψ_s Q = 5.9 kN/m (Steel)
 k_2 G + ψ_s Q = 7.5 kN/m (Timber)

Load duration factor (short term), ψ_s = 0.7
 Duration of Load factor, k_2 = 2.0
 (moisture content < 18%)

Working Stress Loads:

G + Q = 7.7 kN/m

ULTIMATE LIMIT STATE DESIGN:

design moment (ULS): $M^* = \frac{w l^2}{8}$
 $M^* = 9.3 \text{ kNm} < \Phi M_n$

w = 11.0 kN/m
 l = Beam span
 l = 2600 mm

MATERIAL PROPERTIES:

Timber member properties:

Member Type: Double
 Timber Grade = G8
 Strength reduction factor, ϕ = 0.8
 Load duration factor, k_1 = 0.8
 Parallel support factor, k_4 = 1.14
 Stability factor, k_8 = 1.00
 Bending strength, f_b = 12 MPa

For Timber:

$F_b = \Phi k_1 k_4 k_8 f_b$
 $F_b = 8.5 \text{ MPa}$

Steel member properties:

Strength reduction factor, ϕ = 0.9
 Yield strength, f_y = 300 MPa

For Steel:

$F_b = \Phi f_y$
 $F_b = 270 \text{ MPa}$



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JOB:

Morrison

SUBJECT:

Bearer

BY:

JP

BEAM:

Deck Bearer

DATE:

25/02/13

JOB NO:

16136

effective section moduli:

$$M^* = \Phi M_n$$

$$\Phi M_n = F_b Z$$

$$Z_{req} \geq \frac{M^*}{F_b}$$

$$Z_{req} \geq 1086.9 \times 10^3 \text{ mm}^3$$

$$Z_{req} \geq 34.4 \times 10^3 \text{ mm}^3$$

Try: 2/290x45 SG8

$$Z_{(Actual)} = 1261.5 \times 10^3 \text{ mm}^3$$

SERVICABILITY LIMIT STATE DESIGN:

$$\text{limit deflection to } \frac{\text{span}}{500} = 5.2 \text{ mm}$$

$$\Delta = \frac{5 w l^4}{384 EI}$$

MATERIAL PROPERTIES:

Timber member properties:

Distributed dead load, $w = 3.3 \text{ kN/m}$
Distributed dead and live load, $w = 7.5 \text{ kN/m}$
Modulus of elasticity, $E = 6700 \text{ MPa}$

Steel member properties:

Distributed dead load, $w = 1.7 \text{ kN/m}$
Distributed dead and live load, $w = 5.9 \text{ kN/m}$
Modulus of Elasticity, $E = 200 \text{ GPa}$

$$I_{req} \geq 128.1 \times 10^6 \text{ mm}^4$$

$$I_{req} \geq 3.3 \times 10^6 \text{ mm}^4$$

Try: 2/290x45 SG8

$$I_{(Actual)} = 182.9 \times 10^6 \text{ mm}^4$$

1kN point load deflection:
(limited to between 1-2 mm)

$$\Delta = \frac{Pl^3}{48EI}$$

$$= 0.3 \text{ mm}$$

$P = 1 \text{ kN}$

OK!

Moment capacity, $\phi M = 10.8 \text{ kNm}$

OK!

Theoretical dead load deflection, $\Delta = 1.6 \text{ mm}$

OK!

Theoretical dead and live load deflection, $\Delta = 3.6 \text{ mm}$

OK!

0.0014 l

Required Precamber = 0.0 mm

Use 2/290x45 SG8

SUPPORT REACTIONS:

$$1.35G = 2.9 \text{ kN}$$

$$1.2G + 1.5Q = 14.3 \text{ kN}$$

$$G + \psi Q = 7.6 \text{ kN}$$

$$k_2G + \psi_s Q = 9.8 \text{ kN}$$

$$G + Q = 9.9 \text{ kN}$$

HUTCHINSON

Sheet: Deck Bearer
File: 16136 Morrison (Calcs).xls
Engineer: IH



UNIFORMLY DISTRIBUTED LOADS (SIMPLY SUPPORTED):

Dead Loads, G:

roof:	0.45 kPa x	1.5 m = 0.7 kN/m
floor:	0.50 kPa x	0.0 m = 0.0 kN/m
internal walls:	0.35 kPa x	0.0 m = 0.0 kN/m
external walls:	0.50 kPa x	0.0 m = 0.0 kN/m
self weight (member) = 0.25 kN/m		

$$G = 0.9 \text{ kN/m}$$

Live Loads, Q:

roof:	0.25 kPa x	1.5 m = 0.4 kN/m
external floor:	2.00 kPa x	0.0 m = 0.0 kN/m
internal floor:	1.50 kPa x	0.0 m = 0.0 kN/m

$$Q = 0.4 \text{ kN/m}$$

POINT LOADS:

$$P_1 \quad G = 2.8 \text{ kN}$$

$$Q = 1.6 \text{ kN}$$

$$P_2 \quad G = 2.8 \text{ kN}$$

$$Q = 1.6 \text{ kN}$$

LOAD COMBINATIONS:

SLS = Serviceability Limit State

ULS = Ultimate Limit State

ULS Distributed Loads:

$$1.35G = 1.2 \text{ kN/m}$$

$$1.2G + 1.5Q = 1.7 \text{ kN/m}$$

Point Loads:

$$3.8 \text{ kN} \quad 3.8 \text{ kN}$$

$$5.7 \text{ kN} \quad 5.7 \text{ kN}$$

SLS Distributed Loads:

$G + 0Q = 0.9 \text{ kN/m}$	(Steel)	2.8 kN	2.8 kN
$2.0G + 0Q = 1.9 \text{ kN/m}$	(Timber)	5.6 kN	5.6 kN

Load duration factor (short term), $\psi_s = 0.0$

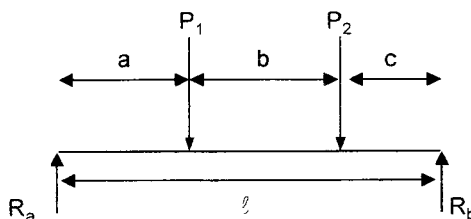
Duration of Load factor, $k_2 = 2.0$
(moisture content < 18%)

Working Stress Loads:

$$G + Q = 1.3 \text{ kN/m} \quad 4.3 \text{ kN} \quad 4.3 \text{ kN}$$

ULTIMATE LIMIT STATE DESIGN:

Design moment (ULS):



l = Beam Span

$$l = 6000 \text{ mm}$$

$$a = 1670 \text{ mm}$$

$$b = 2660 \text{ mm}$$

$$c = 1670 \text{ mm}$$

$$M^* = 17.0 \text{ kNm} < \phi M_n$$

Load Case - 1.2G + 1.5Q

JOB:

Morrison

SUBJECT:

Mens Shower Roof Beam

BY:

JP

BEAM:

DATE:

26/02/13

JOB NO:

16136

MATERIAL PROPERTIES:

Timber member properties:

Member Type: Double
Timber Grade = MSG8
Strength reduction factor, $\phi = 0.8$
Load duration factor, $k_1 = 0.8$
Parallel support factor, $k_4 = 1.14$
Stability factor, $k_8 = 1.00$
Bending strength, $f_b = 14 \text{ MPa}$

For Timber:

$$F_b = \phi k_1 k_4 k_8 f_b$$

$$F_b = 10.2 \text{ MPa}$$

Steel member properties:

Strength reduction factor, $\phi = 0.9$
Yield strength, $f_y = 300 \text{ MPa}$

For Steel:

$$F_b = \phi f_y$$

$$F_b = 270 \text{ MPa}$$

Effective section moduli:
(assuming full lateral restraint)

$$\Phi M_n \geq M^*$$

$$\Phi M_n = F_b Z$$

$$Z_{\text{req}} \geq \frac{M^*}{F_b}$$

$$Z_{\text{req}} \geq 1664.3 \times 10^3 \text{ mm}^3$$

$$Z_{\text{req}} \geq 63.0 \times 10^3 \text{ mm}^3$$

Try: 250UB26

$$Z_{\text{(Actual)}} = 232.0 \times 10^3 \text{ mm}^3$$

SERVICABILITY LIMIT STATE DESIGN:

Limit gravity deflection to $\frac{\text{span}}{1000} = 6.0 \text{ mm}$

MATERIAL PROPERTIES:

Timber member properties:

Distributed dead load, $w = 1.9 \text{ kN/m}$
Distributed dead and live load, $w = 1.9 \text{ kN/m}$
Point load dead load, $P_1 = 5.6 \text{ kN}$
Point load dead and live load, $P_1 = 5.6 \text{ kN}$
Point load dead load, $P_2 = 5.6 \text{ kN}$
Point load dead and live load, $P_2 = 5.6 \text{ kN}$

Modulus of Elasticity, $E = 6700 \text{ MPa}$

$$I_{\text{req}} \geq 1712.0 \times 10^6 \text{ mm}^4$$

Try: 250UB26

$$I_{\text{(Actual)}} = 35.4 \times 10^6 \text{ mm}^4$$

Steel member properties:

Distributed dead load, $w = 0.9 \text{ kN/m}$
Distributed dead and live load, $w = 0.9 \text{ kN/m}$
Point load dead load, $P_1 = 2.8 \text{ kN}$
Point load dead and live load, $P_1 = 2.8 \text{ kN}$
Point load dead load, $P_2 = 2.8 \text{ kN}$
Point load dead and live load, $P_2 = 2.8 \text{ kN}$

Modulus of Elasticity, $E = 200000 \text{ MPa}$

$$I_{\text{req}} \geq 28.7 \times 10^6 \text{ mm}^4$$



Hutchinson
CONSULTING ENGINEERS

JOB:

Morrison

SUBJECT:

Mens Shower Roof Beam

BY:

JP

BEAM:

DATE:

26/02/13

JOB NO:

16136

1kN point load deflection:
(limited to between 1-2 mm)

$$\Delta = \frac{Pl^3}{48EI}$$
$$= 0.6 \text{ mm}$$

P = 1kN

OK!

Max Gravity Deflection = 4.86 mm

< 6.0mm, OK!

DESIGN SUMMARY:

Moment capacity, $\phi M = 62.6 \text{ kNm}$

OK!

Theoretical dead load deflection, $\Delta = 4.9 \text{ mm}$

OK!

Theoretical dead and live load deflection, $\Delta = 4.9 \text{ mm}$

OK!

Use 250UB26

SUPPORT REACTIONS:

	Ra	Rb
1.35G =	7.5 kN	7.5 kN
1.2G + 1.5Q =	10.7 kN	10.7 kN
G + $\psi_s Q$ =	5.6 kN	5.6 kN
$k_2 G$ + $\psi_s Q$ =	11.1 kN	11.1 kN
G + Q =	8.2 kN	8.2 kN

JOB: MORRISON

SUBJECT: FOOTING DESIGN

BY: JP

PAGE

DATE:

JOB NO:

8/2/13 16136

Footing Design

consider footing with max roof and wall
trib load.

- Mens shower external wall

- 3.6m tall masonry wall

- 4.5m trib width of Roof load.

Permanent Loads - G

Roof: $4.5 \times .45 =$
Wall: $2.4 \times .14 \times 3.6 =$
Footing Self weight: $.3 \times .5 \times 24 =$

2 kN/m
 16.42 kN/m
 3.6 kN/m

 22 kN/m

Imposed Loads - Q

Roof: $.25 \times 4.5 =$

1.1 kN/m

ULS Factored Load = $1.2G + 1.5Q$

$W^* = 28.1 \text{ kN/m}$

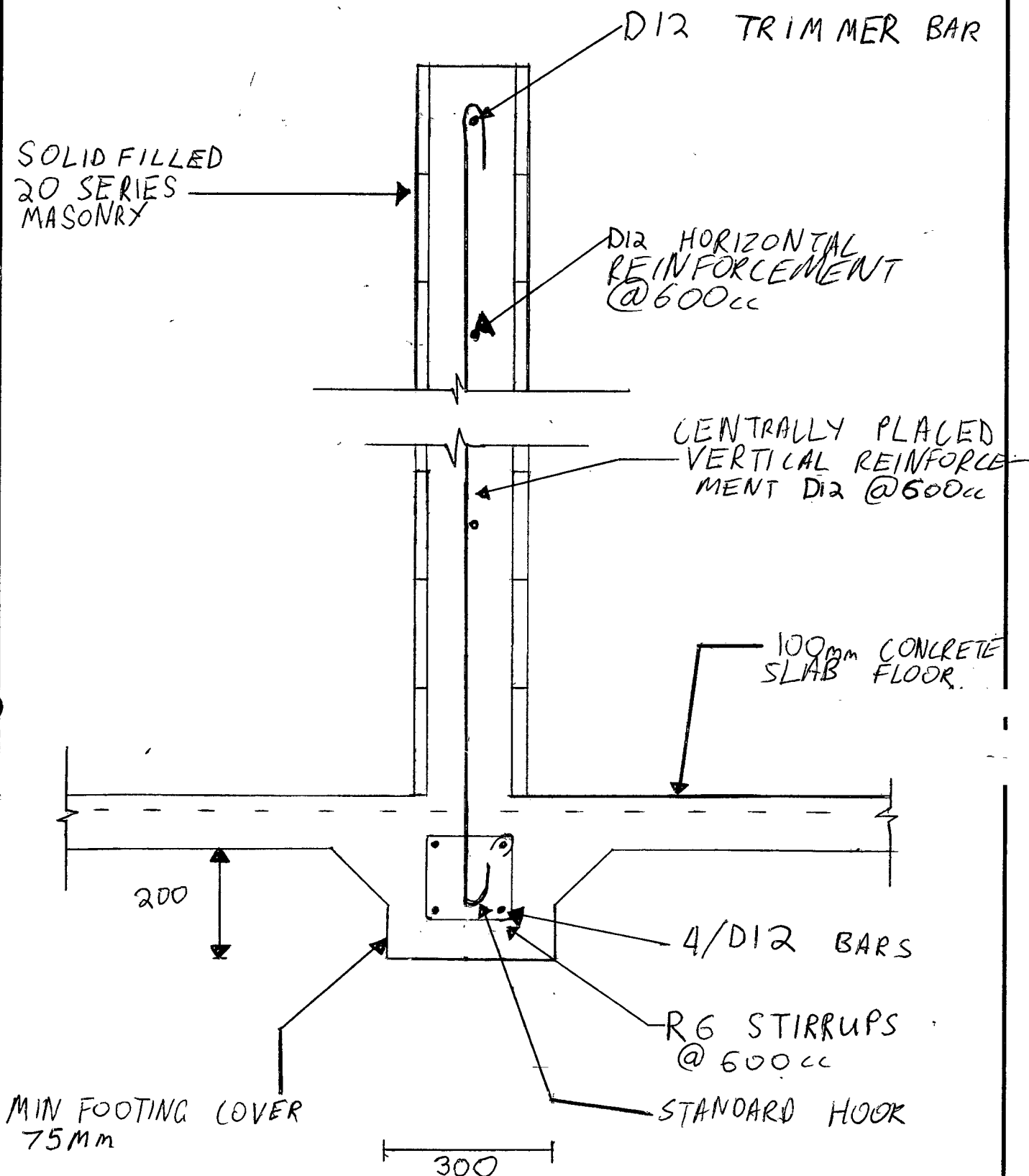
Try 300x300 strip Footing

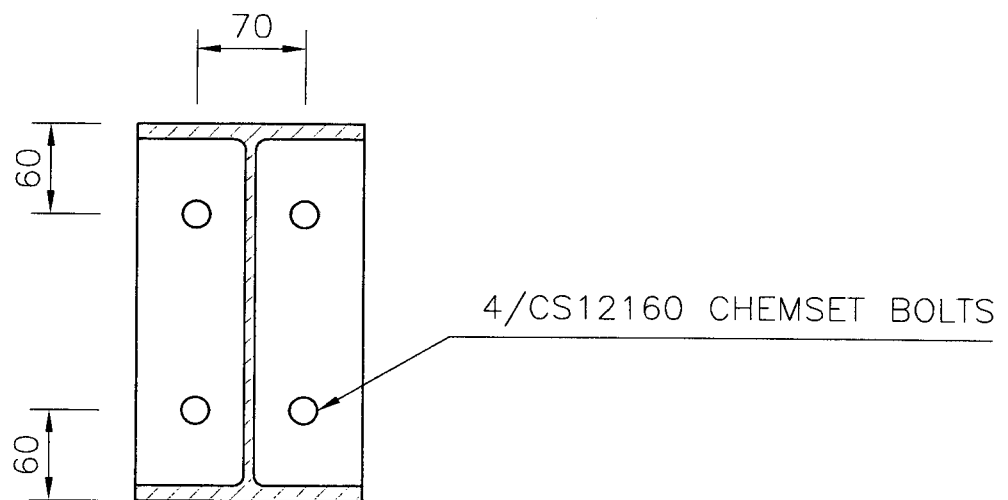
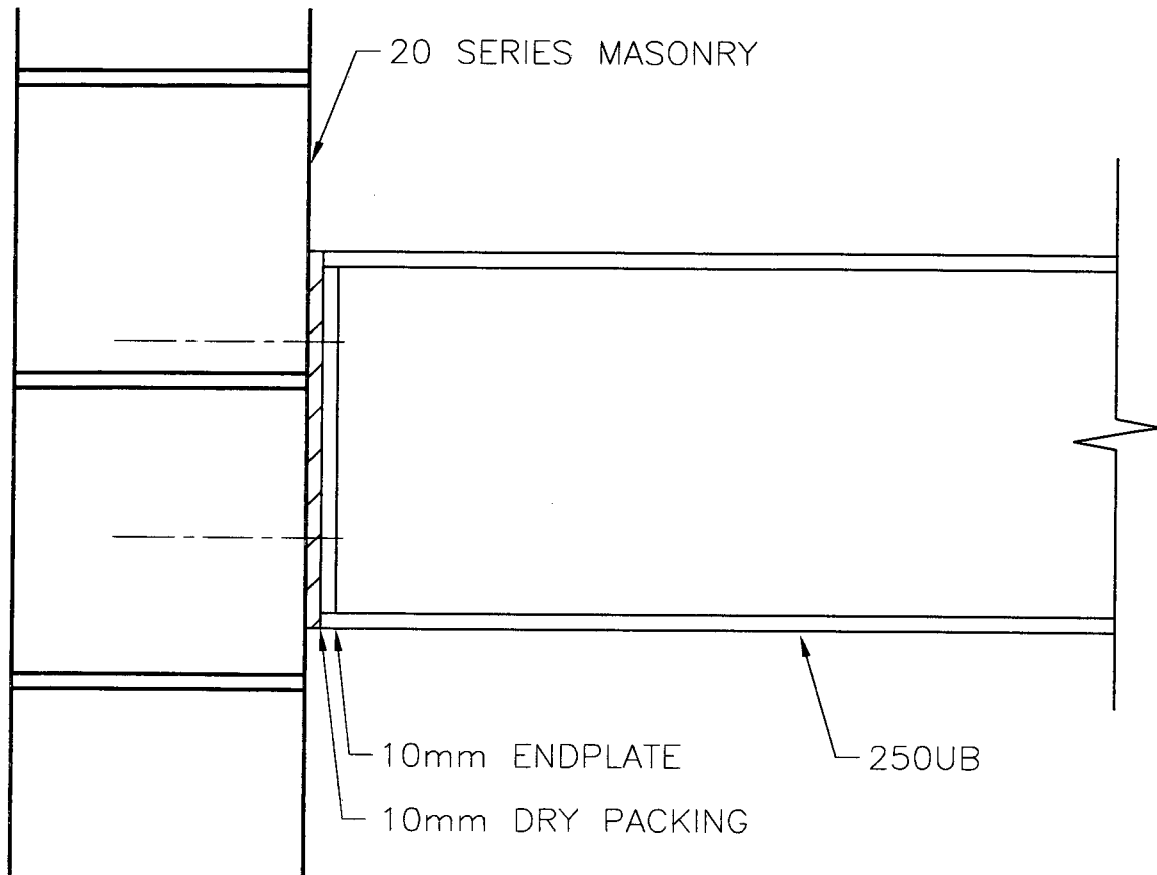
Bearing Pressure = $\frac{28.1}{.3} =$

93.5 kPa

Dependable soil strength = $150 \text{ kPa} > 94 \text{ kPa}$ OK

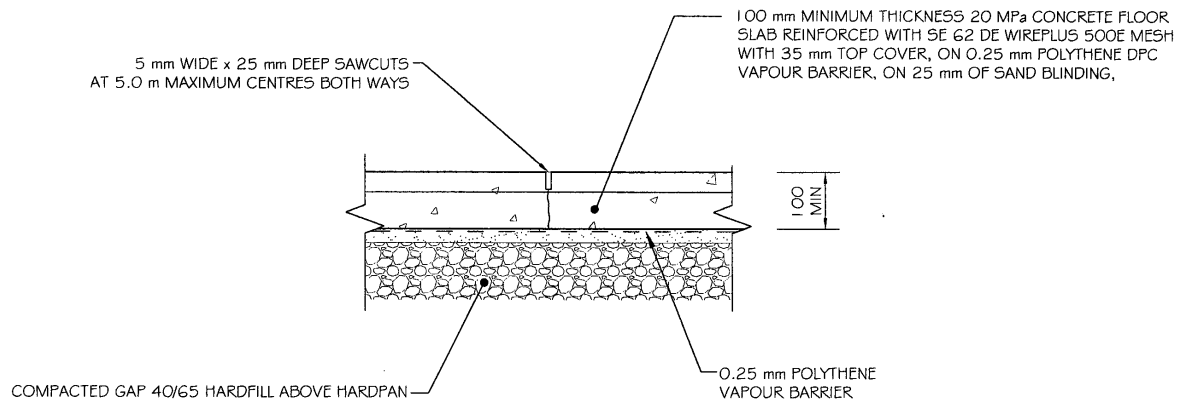
USE: 300x300 strip footing





25U
3

MASONRY CONNECTION
TO 250 UB

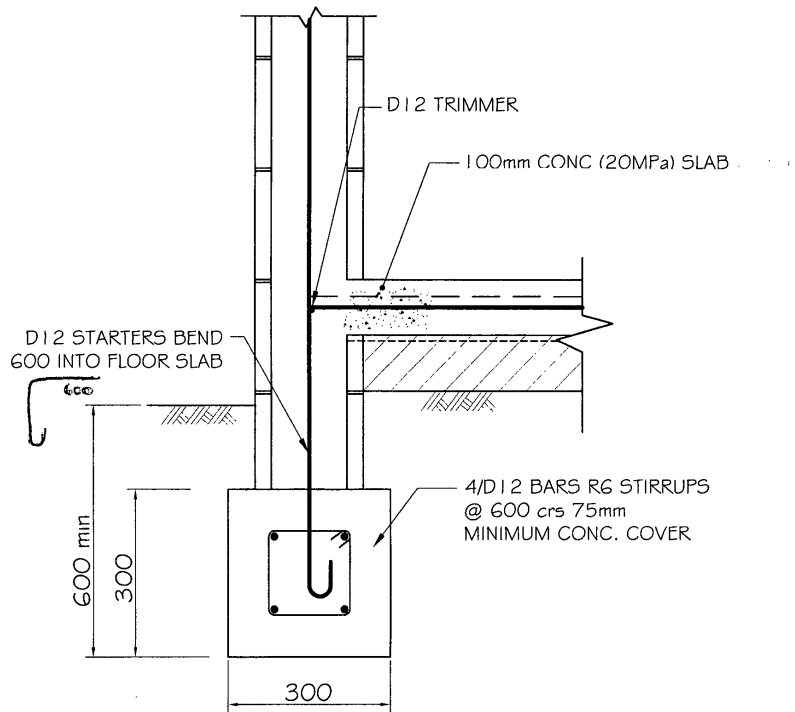


TYPICAL SLAB DETAIL

SCALE 1:10



Ground Floor Eian House P.O. Box 150 Telephone (09) 426-5702
154 Centreway Road Orewa Fax (09) 426-9669
Orewa 0946 Auckland Email info@hc.co.nz



FM2

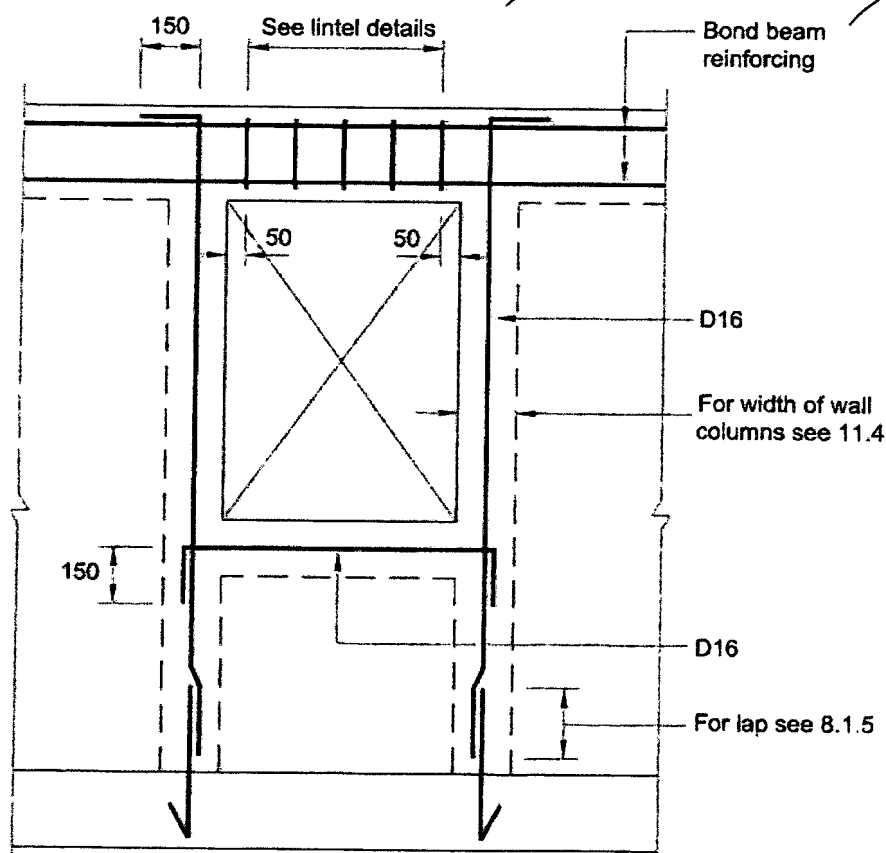
EDGE MASONRY WALL FOOTING DETAIL

Table 8.2(a) – Reinforcement for partially filled masonry structural walls (see 8.3.1 and 8.3.2)

	Vertical reinforcement				Horizontal reinforcement			
	Max. spacing of vertical bars (mm)	Block used			Max. spacing of horizontal bars (mm)	Block used		
		15 series	20 series	25 series		15 series	20 series	25 series
All seismic zones	800	D12	D12	D12	2800	D16	D16	D16

Table 8.2(b) – Reinforcement for solid filled masonry structural walls (see 8.3.1 and 8.3.2)

	Vertical reinforcement				Horizontal reinforcement			
	Max. spacing of vertical bars (mm)	Block used			Max. spacing of horizontal bars (mm)	Block used		
		15 series	20 series	25 series		15 series	20 series	25 series
All seismic zones	800	D12	D12	D12	1200	D12	D12	D16



NOTE - When the bond beam does not combine to form the lintel, separate lintel steel (see section 11) shall be used over the opening.

Figure 8.1 – Reinforcement above and below openings (see 8.3.5)

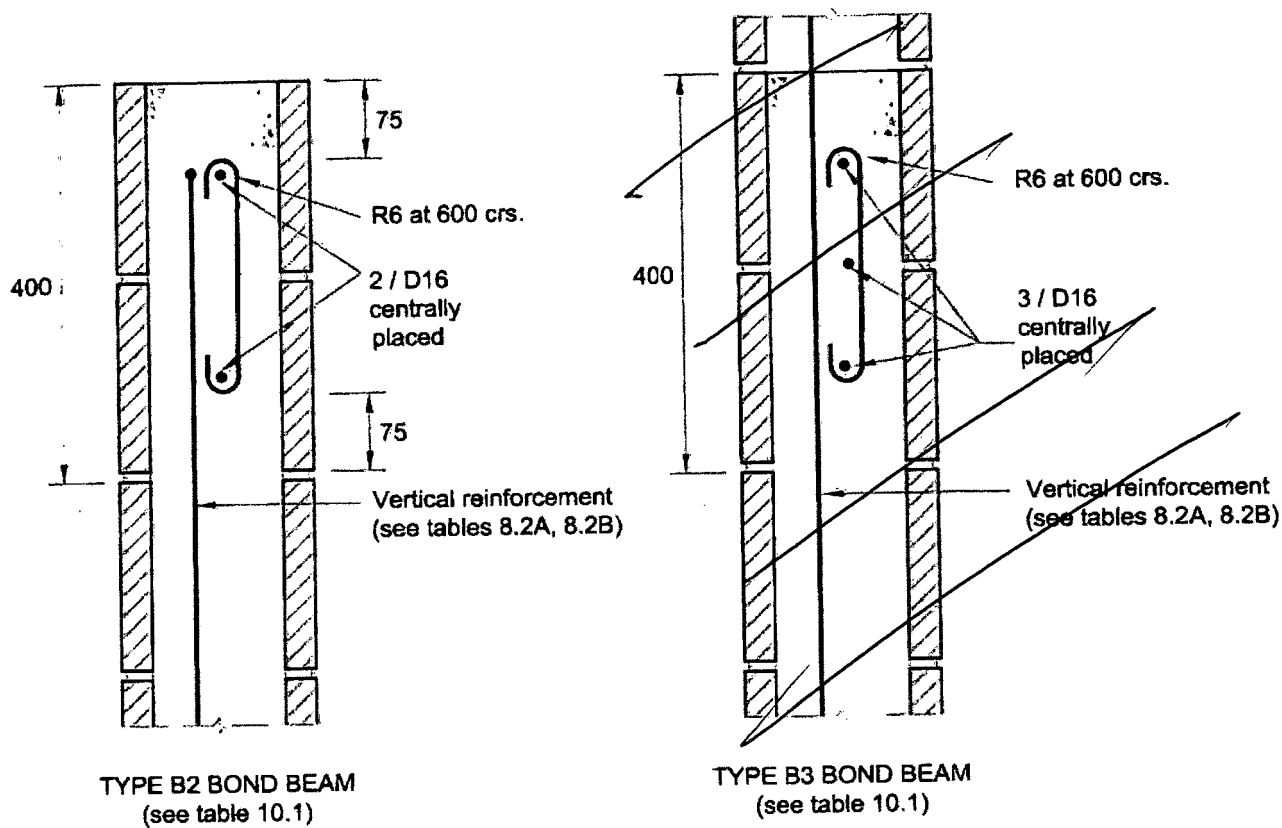


Figure 10.1 – Bond beam details – Bracing line system (see 10.2.1)

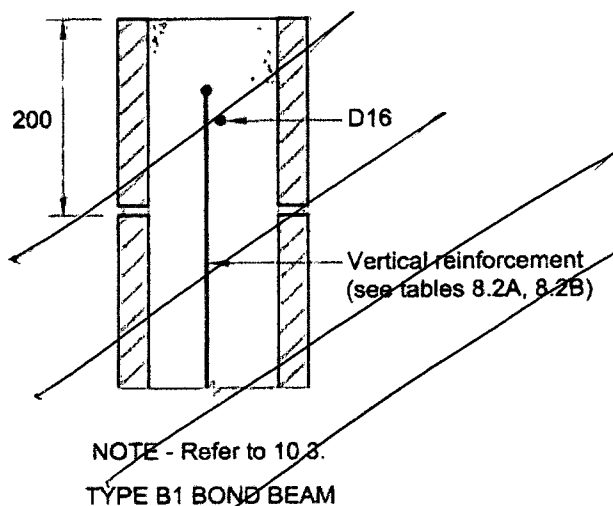


Figure 10.2 - Bond beam details - Diaphragm system (see 10.3.2)

10.5 Gable shaped walls

10.5.1

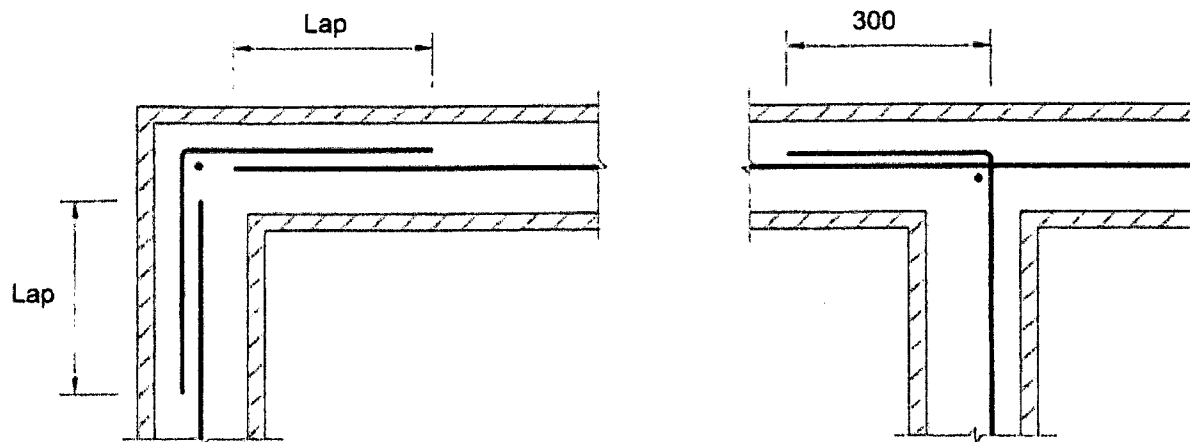
A raking *bond beam* Type B2 shall be provided at the top of every *gable* shaped wall and shall be connected to and continuous with other adjoining *bond beams*.

10.5.2

The size of raking *bond beams* shall be determined from table 10.1 in accordance with the sloping distance between *bracing lines*.

10.5.3

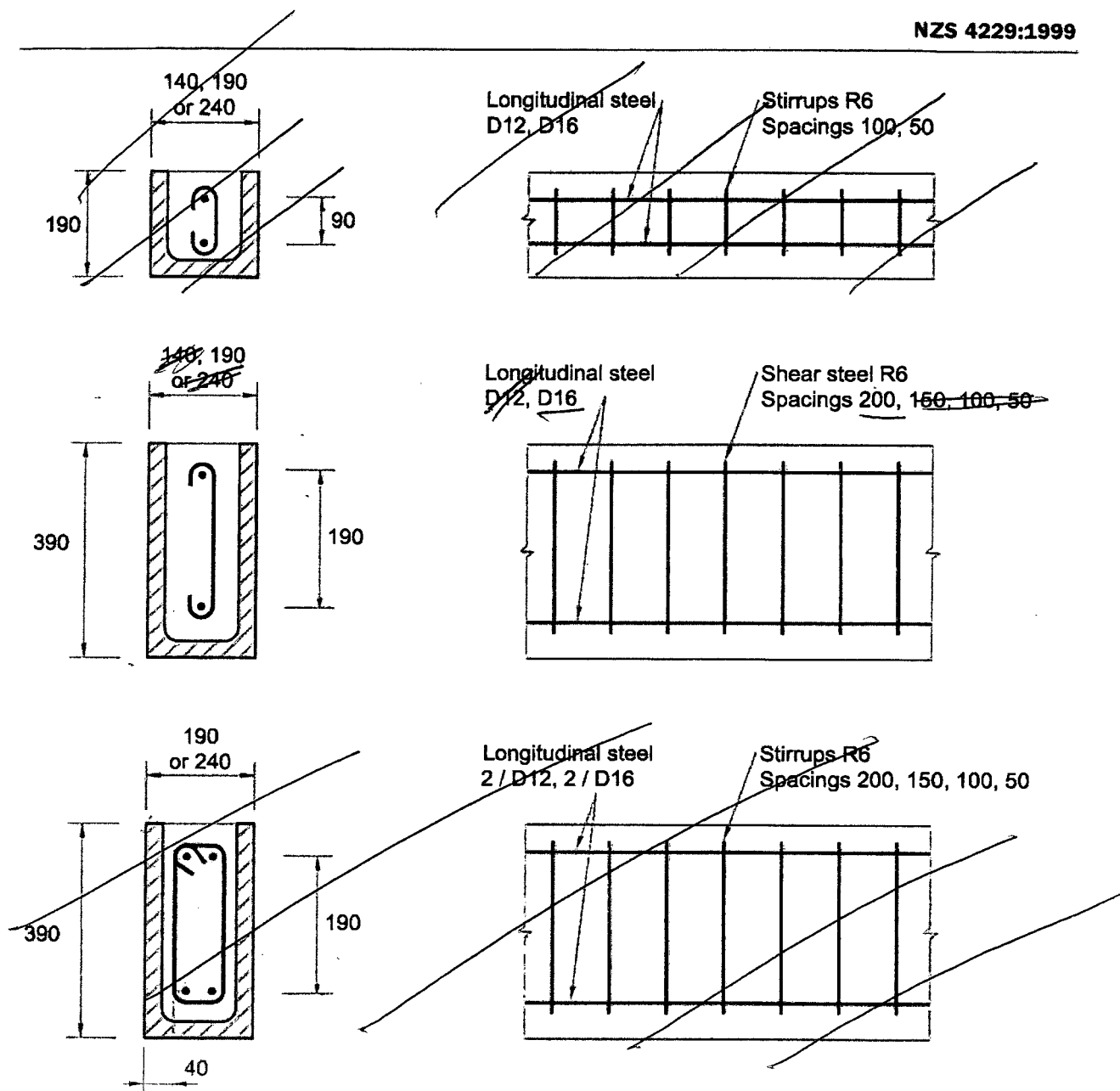
An *intermediate bond beam* Type B3 shall be provided at the top of the wall immediately beneath the *gable* shaped wall and be connected to, and continuous with adjoining *bond beams*.



NOTE -

- (1) Laps to be in accordance with 8.1.5.
- (2) For 4 bar bond beams see figure 6.6 for lapping requirements.

Figure 10.3 - Bond beam intersections (see 10.4.1)



NOTE - For selection of steel see tables 11.1(a), 11.1(b), 11.2(a) and 11.2(b).

Figure 11.2 - Lintel reinforcement layouts (see 11.2.4)

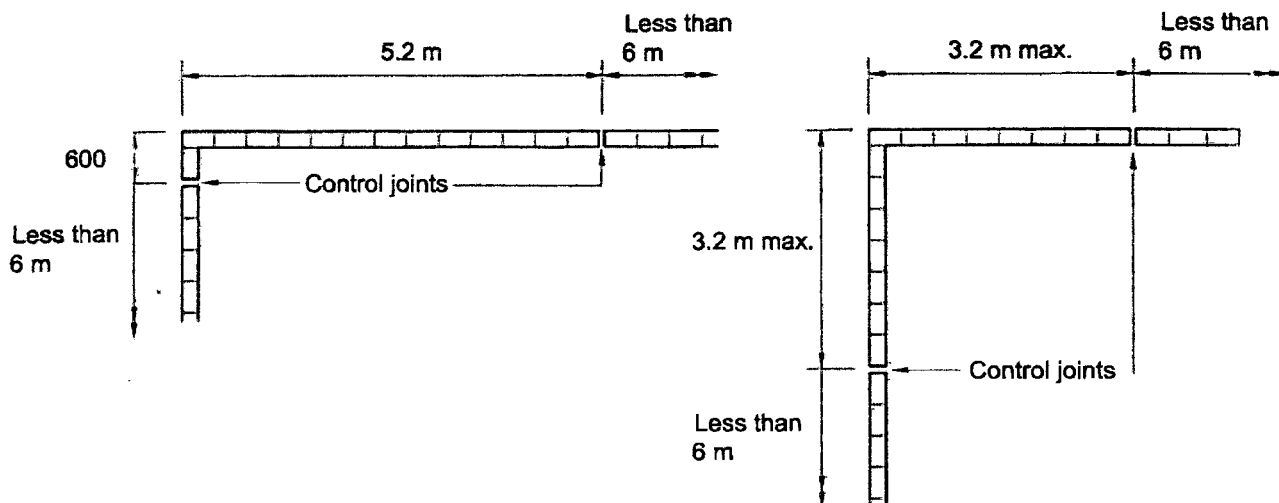


Figure 13.1 – Location of control joints for shrinkage (see 13.1.1)

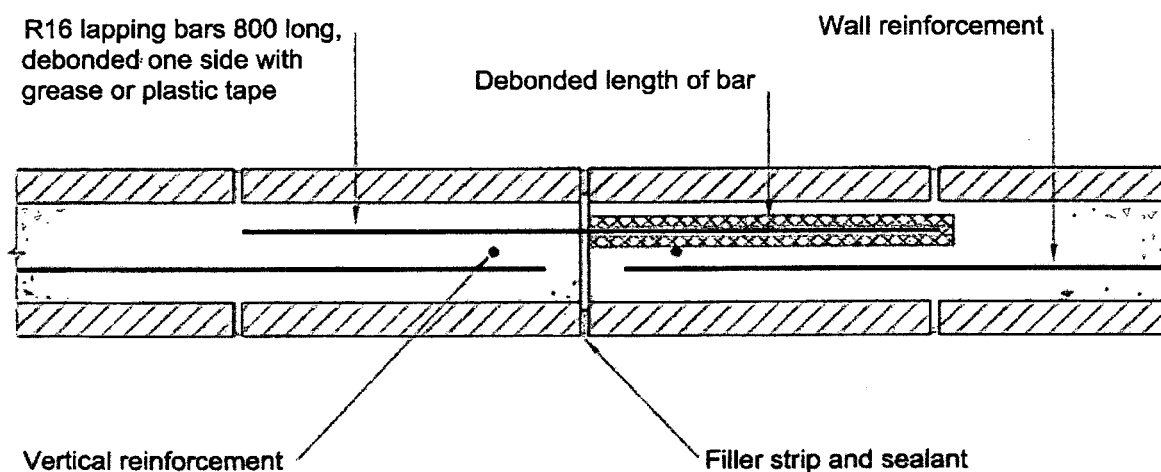


Figure 13.2 – Control joint detail (see 13.1.3)

Supplementary block required
for 90 x 35 framing only

4 x 60mm x 3.15dia. Nails

Angle Brace

4 x 60mm x 3.15dia. Nails

'T' Brace

Supplementary block required
for 90 x 35 framing only

ANGLE BRACE

.85 G250 Z275 GALVANISED STEEL

Characteristic Load	Tested at 45°
Tension	13.18kN
Compression (600mm) Brace Length (800mm)	4.23kN 3.0kN
End nail fixing 3 - 75mm x 3.15dia. F.H. nails	3.88kN
Serviceability Load	1.9kN

'T' BRACE

.85 G250 Z275 GALVANISED STEEL

Characteristic Load	Tested at 45°
Tension	14.15kN
Compression (600mm) Brace Length (800mm)	4.06kN 3.09kN
End nail fixing 3 - 75mm x 3.15dia. F.H. nails	4.26kN
Serviceability Load	1.9kN

Strip Brace

2 nails top edge, 3 nails vertical face
(not in same line)

90 x 35
or 100 x 50

STRIP BRACE

.55 G550 Z275 GALVANISED STEEL

Characteristic Load	Strip Brace Only	Strip Brace With Tensioner
Tension	8.44kN	8.05kN
Elongation 0.5mm/m/kN including nail slip		
End nail fixing 75mm x 3.15dia. F.H. nails		

20mm

STRAP NAIL

.95 G300 Z275 GALVANISED STEEL

	Tension
Characteristic Load	9.1 kN/pair
Serviceability Load	4.7 kN/pair

Strap Nail

Producer statement design (PS1)



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

Author name: **PETER JOHNS** Author number: **2177**

Author company: **MAHURANGI SHEETMETALS LTD**

Building consent N°: **ABA 101 4136**

Site address: **336 SANDSIT ROAD - SANDSIT**

Legal description: **PT ALLOTMENT 23 PARISH OF MAHURANGI**

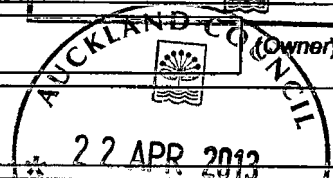
Engaged by: **AIR CON NORTH**

To provide design services in respect of:
(describe work) ☒ part ☐ all

NZBC clauses: (circle as applicable)

NB: all statements must include B2

B1	B2	C1	C2	C3	C4	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	



The design has been prepared in accordance with:

☐ Compliance documents issued by the Department of Building and Housing

NZ 4303 - A5 1668-2
(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: **PROPOSED VENTILATION**

Drawing numbers: **SM 3**

The producer statement is subject to:

(i) Site verification of the following design assumptions:

N/A

(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.

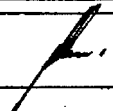
**COMPLIANCE
SCHEDULE
REQUIRED**

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

--

(Agreement must be attached)

Signed by:



Date:

20/04/13

☐ ACENZ ☐ IPENZ ☐ CPENG ☐ NZIA ☒ Other (specify)

MIRHACE

855

(Membership number)

Address:

69 WOODROCKS ROAD WARKWORTH

Postcode: 0941

Phone:

09 425 7855

Fax:

09 425 7853

Mobile:

0274 807 451

Email

mahupj@extra.co.nz

COUNCIL USE ONLY

☐ Central ☐ Henderson ☐ Manukau ☐ Orewa ☐ Papakura ☐ Pukekohe ☐ Takapuna

Received by:

--

Register
checked:

YES

NO

Signature:

--

Registration
current:

YES

NO

Producer statement accepted as establishing compliance with the Building Code:

YES

NO

COMMENTS

--

Producer statement design review (PS2)



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

Author name: **PETER JOHNS** Author number: **2177**

Author company: **MAHURANGI SHEETMETALS LTD**

Building consent N°: **ABA 101 4136**

Site address: **336 SANDSPIT ROAD - SANDSPIT**

Legal description: **PT ALLOTMENT 23 PARISH OF MAHURANGI**

Engaged by: **AIR - CON NORTH.** (Owner)

To provide design review services in respect of:
(Describe work)

☒ part
☐ all

NZBC clauses: (tick as applicable)

☐ B1	☐ B2	☐ C1	☐ C2	☐ C3	☐ C4	☐ 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:

☐ Compliance documents issued by the Department of Building and Housing

(verification method / acceptable solution)

NZ 4303 & AS 1668.2

☐ Alternative solution (attach schedule if required)

The proposed building work covered by this producer statement design review 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:

PROPOSED VENTILATION

Drawing numbers:

SM3

The producer statement is subject to:

On the basis of the review undertaken, 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.

Signed by:

[Signature]

Date:

20/04/13

☐ ACENZ ☐ IPENZ ☐ CPENG ☐ NZIA ☒ Other (specify)

MIRHAGE

(Membership number)

855

Address:
(Agent)

69 WOODCOCKS ROAD WARKWORTH. Postcode: 0941

Phone:

09 425 7855

Fax:

09 425 7853

Mobile:

0274 807 451

Email

mahupj@xtra.co.nz

COUNCIL USE ONLY

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Received by:

Register
checked:

YES

NO

Signature:

Registration
current:

YES

NO

Producer statement accepted as establishing compliance with the Building Code:

YES

NO

COMMENTS



AIR CON
NORTH AUCKLAND

PH: 09 422 3598
FAX 09 422 3607
Mobile 021 496 358
P O Box 717
Warkworth
AUCKLAND 0941

20 April 2013

PROPOSED ABLUTION BLOCK SANDSPIT HOLIDAY PARK VENTILATION

The following is calculations used to attain the ventilation requirements for the proposed ablution block at the Sandspit Holiday Park 1336 Sandspit Road.

Men's Showers:

5020 x 4950 x 2800 @ 8 air changes = 155 L/sec
Or @ 25 L/sec x 5 stalls = 125 L/sec
Or 10 L sec/m² = 24.95 m² = 249.5 L/sec

Women's Showers:

3820 x 4620 + 1860 x 2020 x 8 air changes = 133 L/sec
Or @ 25 L/sec x 6 stalls = 150 L/sec
Or 10 L sec/m² x 21.39 m² = 214 L/sec

Men and women's showers require 1668.6 m³/hr (463.5 L/sec) of ventilation. This will be accomplished by using a Pacific Fan Roof unit RH400-4-1 (or equivalent) extracting at 2700 m³/hr.

Men's Toilets:

7000 x 3925 x 2800 x 8 air changes = 171 L/sec
Or @ 25 L/sec x 9 = 225 L/sec
Or 10 L/sec x 24.5 m² = 245 L/sec

Women's Toilets:

7000 x 3925 x 2800 x 8 air changes = 146 L/sec
Or @ 25 L/sec x 6 stalls = 150 L/sec
Or 10 L/sec x 23.4 m² = 234 L/sec

Men and women's toilets require 1724.4 m³/hr (479 L/sec) of ventilation. This will be accomplished by using a Pacific Fan Roof unit RH400-4-1 (or equivalent) extracting at 2700 m³/hr.



Suppliers of Commercial & Domestic Air Conditioning • Lease & Lease to Buy Air Conditioners / Heat Pumps





AIR CON
NORTH AUCKLAND

PH: 09 422 3598
FAX 09 422 3607
Mobile 021 496 358
P O Box 717
Warkworth
AUCKLAND 0941

Unisex toilets:

Five individual toilets

2 x smaller toilets @ 25 L/sec = 50 L/sec

3 x large toilets 1800 x 2200 x 2800 = 120 L/sec

Total 170 L/sec

These bathrooms require 432 m³/hr (170 L/sec) of ventilation. This will be accomplished by using a Pacific Fan mini vent roof MV220 (or equivalent) extracting 600 m³/hr.

Kitchen:

10536 x 5910 x 2800 = 174m³ x 30 air changes = 1450 L/sec

This kitchen requires 5220 m³/hr (1450 L/sec) of ventilation. This will be accomplished by using a custom extraction hood providing 5400 m³/hr extraction.

Yours faithfully,

Aircon North Auckland Limited
Derek Cuthell
Director.

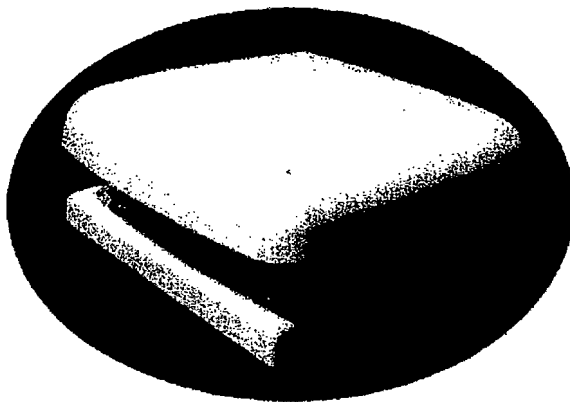
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Pacific Fans Ltd

ROOF UNITS



Low Profile Roof Unit (Horizontal-Extract or Supply Air) are available in 7 models—300 to 500 (4 pole) and 560 & 630 (6 pole)

Cowls and Bases are constructed of fibreglass (white) giving strength and durability, yet relatively lightweight.

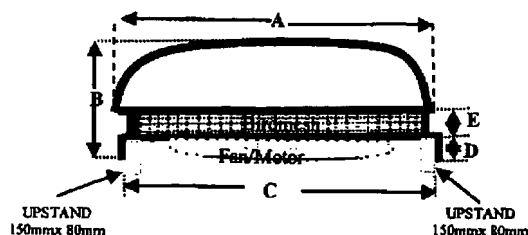
Motors used in these axial units are totally enclosed Airstream rated with IP44 protection and Class F insulation. The standard motor is wound for 230V, 1-phase, 50Hz supply.

TECHNICAL DATA

Ref	Model	Diam, mm	Speed rpm	Voltage V	Hz	m ³ /hr	Watts W	Current Amps	Noise dB(A)	Base ☐
1	RH300-4-1	300	1320	230	50/60	1330	80	0.40	50	510
2	RH350-4-1	350	1320	230	50/60	1440	130	0.58	52	510
3	RH400-4-1	400	1380	230	50/60	2700	180	0.80	58	610
4	RH450-4-1	450	1380	230	50/60	4500	250	1.20	62	610
5	RH500-4-1	500	1380	230	50/60	7000	570	2.50	66	1050
6	RH560-6-1	560	920	230	50/60	6000	270	1.25	58	1050
7	RH630-6-1	630	920	230	50/60	9500	400	1.80	66	1050

DIMENSIONS

Ref	Model	A mm	B mm	C mm	D mm	E mm	Upstand mm	Base mm	Weight kg
1	RH300-4-1	600	400	500	75	75	150 x 50	510	15
2	RH350-4-1	600	400	500	75	75	150 x 50	510	15
3	RH400-4-1	700	500	600	80	100	150 x 50	610	20
4	RH450-4-1	700	500	600	80	100	150 x 50	610	20
5	RH500-4-1	1180	580	1040	100	200	150 x 50	1050	30
6	RH560-6-1	1180	580	1040	100	200	150 x 50	1050	40
7	RH630-6-1	1180	580	1040	100	200	150 x 50	1050	45



PO Box 302-159, North Harbour, Auckland 0751, New Zealand
 Office/Warehouse: 22 Tamdale Grove, Albany, Auckland 0632, New Zealand
 Tel: +64 9 415 1326 · Fax: +64 9 415 1328 · Email: pacific.fans@xtra.co.nz
www.pacificfans.co.nz



Pacific Fans Ltd

MINI-VENT ROOF UNIT

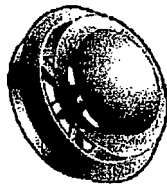
Mini-Vent Roof Units are available in two models, MV190 and MV220.

These small roof ventilators are ideal for extract of air from small areas such as toilets, bathrooms, kitchens and the like - ideal for Apartment Blocks, Motels, Hotels or residential properties.

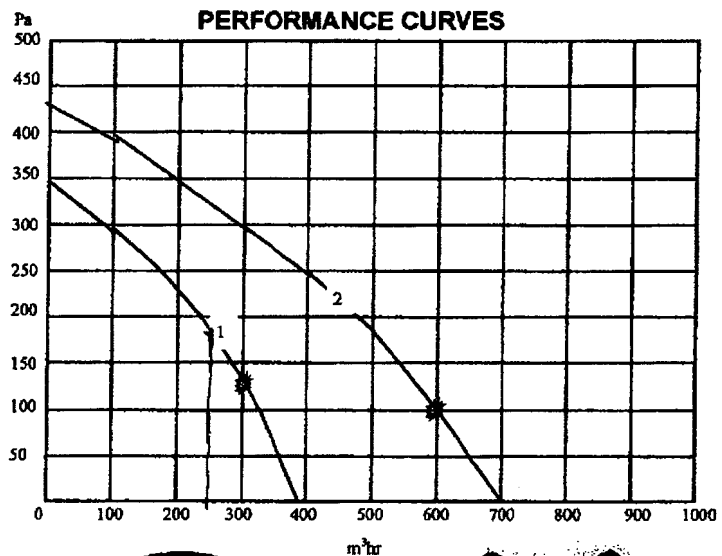
Motorised wheels are used to provide for medium to high pressure development, thus providing sufficient airflow/pressure to extract from one, two, three or even four areas using one Mini-Vent unit.



UPSTAND
ROOF SOAKER



Ceiling Diffuser



T Connector

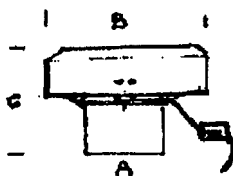


Y Connector

TECHNICAL DATA

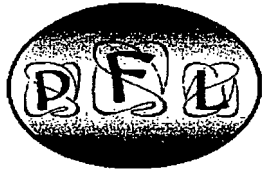
Ref	Model	Diam, mm	Speed	Voltage	Hz	m³/hr	Watts	Amps	Noise dBA
1	MV190	190	2300	230	50	300	72	0.32	54
2	MV220	220	2300	230	50	690	82	0.39	55

DIMENSIONS



Ref	A mm	B mm	C mm
1	150	300	400
2	150	320	400

PO Box 302-159, North Harbour, Auckland, New Zealand
 Office/Warehouse: 22 Tarnedale Grove, Albany 1331, New Zealand
 Tel: +64 9 415 1326 · Fax: +64 9 415 1328 · Email: pacific.fans@xtra.co.nz
www.pacificfans.co.nz



Pacific Fans Ltd

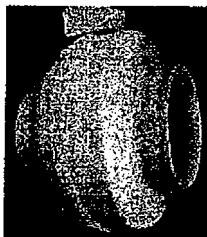
IN LINE CENTRIFUGAL FANS



ILC100



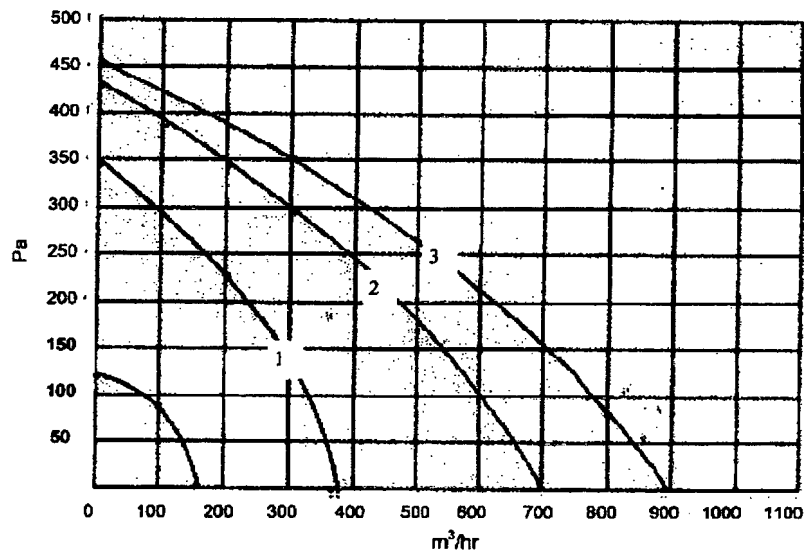
ILC150



ILC200

In Line Centrifugal Fans are available in three sizes 100, 150 & 200 mm. The range is designed for use with flexible or rigid ducting where pressure is a consideration and energy efficiency and low noise levels are required. Suitable for domestic and commercial applications where space is limited.

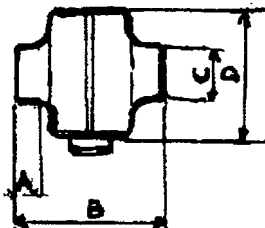
PERFORMANCE CURVES



TECHNICAL DATA

Ref	Model	Diam, mm	Speed	Voltage	Hz	m³/hr	Watts	Amps	Noise dBA
1	ILC100	100	2300	230	50/60	350	75	0.32	54
2	ILC150	150	2300	230	50/60	700	85	0.25	56
3	ILC200	200	2300	230	50/60	900	85	0.29	56

DIMENSIONS



Ref	A Inlet spigot	B length	C outlet diam.	D housing diam
1	25 mm	210 mm	98 mm	241 mm
2	35 mm	260 mm	148 mm	342 mm
3	45 mm	250 mm	198 mm	340 mm

ACCESSORIES

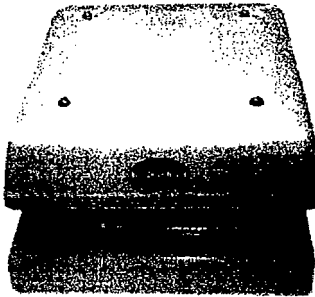


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www.pacificfans.co.nz



Pacific Fans Ltd

MINI ROOF UNIT



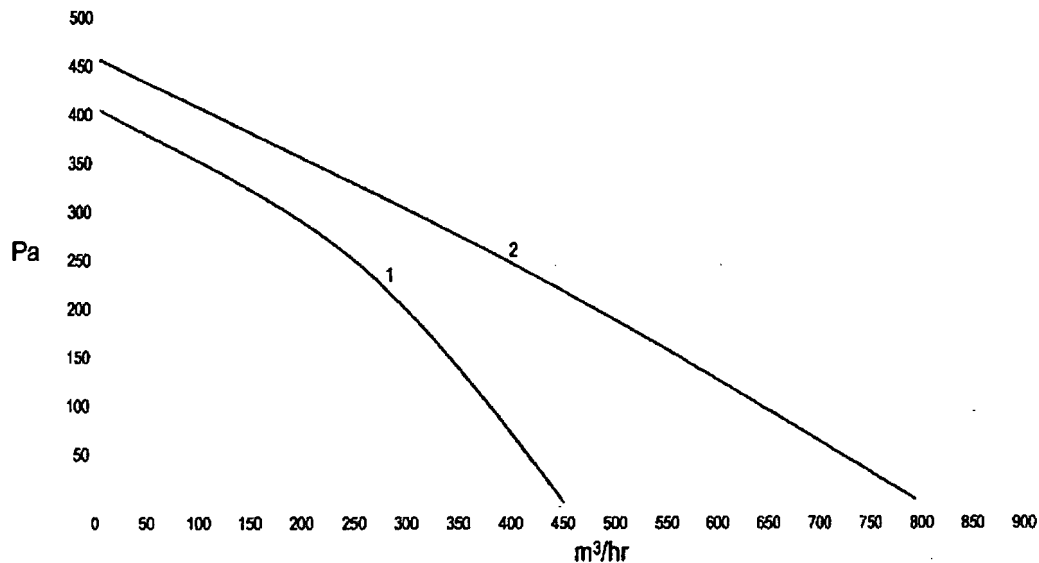
Mini Roof Units are available in 2 models, 190 and 220. 2-pole and 150mm inlet.

These roof ventilators are ideal for extract of air from small areas such as toilets, bathrooms, kitchens and the like.

Cowls and bases are constructed of moulded plastic, UV stabilised, ABS material.

Motorised wheels are used to provide for medium to high pressure development

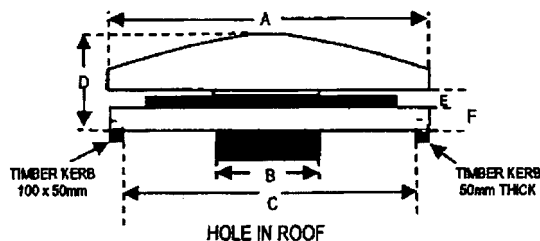
PERFORMANCE CURVES



TECHNICAL DATA

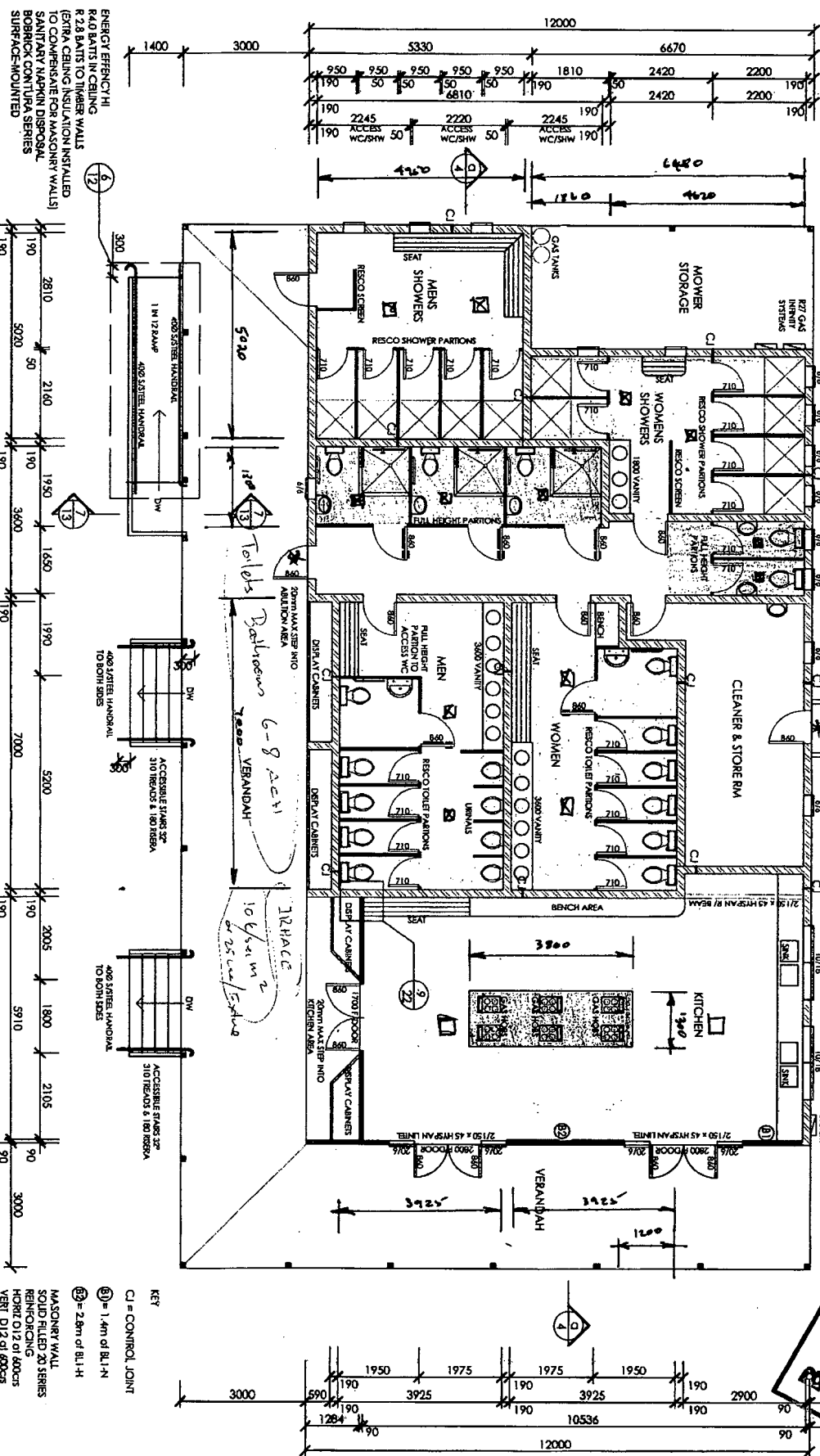
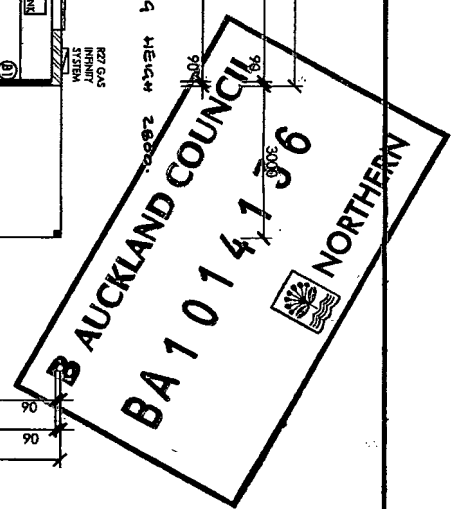
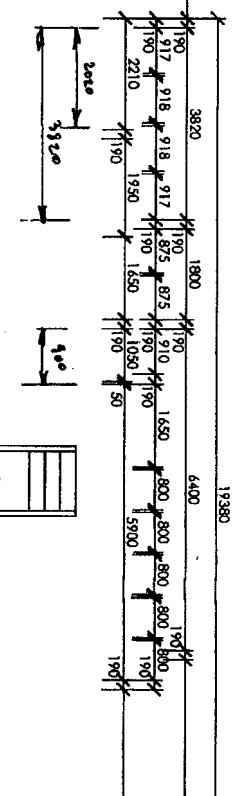
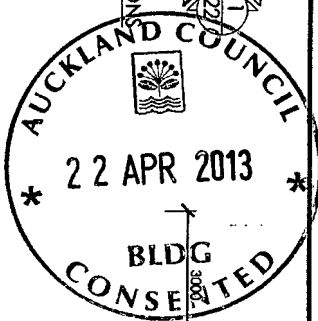
Ref	Model	Motor Wheel	Speed rpm	Voltage	Hz	m³/hr	Watts	Current	Noise
1	RH190-2-1	190mm	2300	230	50/60	463	82	0.36	63
2	RH220-2-1	220mm	2600	230	50.60	800	85	0.38	72

DIMENSIONS



Ref	A	B	C	D	E	F	Wght kgs
1	380	150	400	260	78	82	5
2	380	150	400	260	78	85	5

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ENERGY EFFICIENCY
R4.0 BATS TO CEILING
R2.8 BATS TO TIMBER WALLS
(EXTRA CEILING INSULATION INSTALLED
TO COMPENSATE FOR MASONRY WALLS)
SANTARY WAPIN DISPOSAL
BOBBACK CONTURA SERIES
SURFACE-MOUNTED

* DRIVES TO EXTERNAL DOORS.

FLOOR PLAN 1:100

FLOOR AREA = 251.13m²
MOVER STONE = 17.45m²
DECK AREA = 112.40m²

KEY
CI = CONTROL JOINT
① = 1.4m of BL-N
② = 2.8m of BL-H
MASONRY WALL
SOLID FILL 20 SERIES
REINFORCING
HOBOT 0.12 of 600cs
VERT D12 of 600cs
ALL LINTES 20/16 & R6 TIES at 200cs

Mechanical ventilation plan

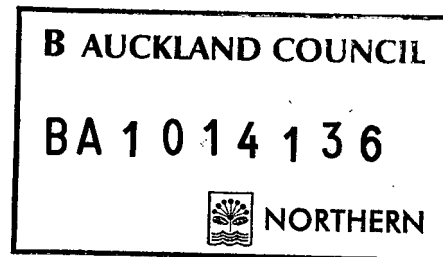
BK ADINZ
ARCHITECTURAL DESIGNERS
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ph (09) 425 7695. fax (09) 425 7695
EMAIL: bkdesign@paradise.net.nz



Project: Proposed Ablution Block #1336 Sandspit Road, Sandspit
Client: Sandspit Holiday Park
Drawing title: Floor Plan

drawing revision	Screening layout	date	Sept '12	sheet no.
revision detail	R1 Gas HW system	drawn	BJK	3 of 23
date	Mar'13 Roof Beam	scale	1:100	
notes	BJK Insulation Details			
rev notes	20mm Step into Building			

JOB No.: BK 2099



PROPOSED ABLUTION BLOCK

For

SANDSPIT HOLIDAY PARK

at

#1332⁴ SANDSPIT ROAD
SANDSPIT



BUILDING SPECIFICATIONS

LEGAL DESCRIPTION

Pt Allotment 23

Psh of Mahurangi

4.1480 ha

A01 PRELIMINARIES AND GENERAL

A01:01 GENERAL

PROPOSED SANDSPIT CAMPING GROUND ABULTION BLOCK

Parties to the work are:

Employer: BRIAN & VANESSA MORRISON
Archit. Designer: BK DESIGN
Engineer: HUTCHINSON CONSULTING ENGINEERS

SITE LOCATION and legal description are:

#1332 SANDSPIT ROAD; SANDSPIT; WARKWORTH

Pt Allot 23

Psh of Mahurangi

Area: 4.1480 ha

THE SITE of the works is shown on the drawings and will be pointed out to Tenderers on request. Tenderers are advised to visit the site and check the slope of the ground, subsoil conditions, any site features etc, as no extras will be paid for foundation work, site drainage or levelling not detailed or specified and which should have been apparent from proper inspection.

SITE LIMITATIONS: Confine access and work to the area of the site indicated on the drawings.

SCOPE: Carry out the contract in accordance with the full intent and meaning of the contract documents taken collectively or separately and including any work which is to be reasonably inferred from those documents all to the satisfaction of the Architect.

A01:02 DOCUMENTATION

NZ BUILDING CODE: Throughout this specification references are made to NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used to establish compliance with the Code.

STANDARDS: Throughout this specification, references are made to Standards produced by the Standards Association of New Zealand and other Associations as well as to various Acts and Regulations. The latest edition at the date of tender – including Provisional standards – applies unless stated otherwise. It is the responsibility of Contractor and of Subcontractors to be informed of the material in those publications which are referred to in this specification.

A01:03

OBLIGATIONS

COMPLY with the NZ Building Code and all statutory obligations and regulations of Territorial Authorities and Regulatory Bodies with regard to the execution of the contract.

BUILDING CONSENT: The Employer will obtain from the Territorial Authority such consents as are required by the Building Act 1991 and will pay all charges due for their processing and issue. Keep the building consent form and documents on site and liaise with the Territorial Authority for all notices to be given and all inspection required during construction to ensure compliance. Return consent form and documents to the Employer on completion.

GIVE ALL OTHER NOTICES to and obtain from all Authorities and Network Utility Operators all other permits, authorisations and approvals which relate to the carrying out of the contract works. Pay all fees and levies in respect of same including re-inspections.

CODE OF COMPLIANCE CERTIFICATE: On behalf of and in the name of the Employer apply for the issue of a Code Compliance Certificate for this building work by Territorial Authority as prescribed under the Building Act, Section 43(3).

COMPLIANCE SCHEDULE: Obtain from the Employer the list of systems and features that were agreed as completing the Compliance Schedule when application was made for Building Consent. Supply to the Employer the inspection, maintenance and reporting procedure information of each system or feature of the building needed to complete the schedule for issue by the Territorial Authority.

INSURANCES: Refer to the conditions of contract and take out all insurance cover called for, stating in the tender those amounts.

HEALTH AND SAFETY: Refer to the requirements of the Health and Safety in Employment Act and if their elimination or isolation are not possible then minimise hazards in the work on site by using proper equipment and techniques. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in procedures for dealing with emergencies.

Fence off, light or otherwise separate any source of danger on the site to people outside of work hours.

NUISANCE: Take all reasonable precautions to prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and any other causes resulting from the construction works. Comply with the requirements of the Territorial Authority and relevant Acts and Standards.

A01:04

MANAGEMENT

ATTEND upon all subcontractors and other trades and render them reasonable assistance, including use of standing scaffolding, connection points for water, power and lighting, provision of extra fixing drawings and the clearing away of rubbish from a predetermined point.

A01:05

TEMPORARY WORKS/SERVICES

PROVIDE, erect and maintain all necessary scaffolding, sheds, toilet, water, power, hoardings and access to the site. Allow for all necessary cartage, craneage, plant hire, storage or the like. Arrange for all temporary works and services necessary for the completion of the works, including that for nominated subcontractors. Pay all fees in connection therewith and remove on completion of the contract.

PROTECT all parts of the work liable to damage and all adjoining property, and all existing site features to be retained, until completion of the contract. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Keep the site and works clean and tidy.

WORK-SITE BARRIERS: Provide fences, hoardings and toe-boards as required by Acceptable Solution F5/AS1 but excluding domestic dwellings up to two storeys above the ground.

A01:06

MATERIALS/WORKMANSHIP GENERALLY

MATERIALS are to be new unless otherwise stated, the best quality of their respective kinds, and complying with relevant BIA Approved Documents, NZ Standards and Regulations.

WORKMANSHIP: Confirm to good trade practice and the relevant Codes of Practice in current use in NZ. All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

SUPPLY all labour, materials, services, temporary works and equipment and plant required for the proper execution and completion of the contract works.

A01:08

COMPLETION

GUARANTEES, stating the period and any special obligations, may be called for in any work section of this specification. The general terms of such guarantees are covered by the General Conditions of Contract but in no case shall the terms or conditions accepted negate the minimum remedies available under common law as if no guarantees had been offered or accepted.

CLEAR AWAY all trade debris from the site and leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove all temporary markings, coverings and protective wrappings. Clean all glass inside and out.

B01

STRUCTURAL STEELWORK

B01:01

GENERAL

SCOPE: The work to be done under this Section comprises the supply of all labour, material and plant for the fabrication, and erection of all structural steel work and miscellaneous metalwork shown or implied on the drawings or in the specification. It includes all temporary bracing and the supply of all structural steel and anchor bolts to be built in by others.

In particular the scope includes the following:

- (a) Supply, fabrication, painting and erection of the steel frames
- (b) Supply and erection of steel purlins and girts
- (c) Supply of steel plates and structural members to be cast in to the floor and walls

Unless otherwise specified or shown on the drawings all structural steelwork shall be carried out in accordance with NZS. 3404:1992 Design of Steel Structures.

DOCUMENTS referred to in this section are:

NZS 3604 Light timber frame buildings not requiring specific design.

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However this specification takes precedence in the event of it being of a higher standard than the cited documents.

B01:02

MATERIALS

All steel shall comply with one of the following specification:

BS 4360: 1979 Grade 43A

AS 1204: 1980 Grade 250

BS 4: 1980 Hot Rolled Sections

Steel shall be completely free from defect such as laminations rust or pitting

Material certificates shall be produced if required

Any materials found to be defective will be rejected before or after fabrication and must be removed from The site and replaced with approved materials by the Contractor at his own expense

B01:03

FABRICATION

In addition to the requirements of NZS 3404 the following conditions shall apply

Structural steelwork shall be of the sections and dimensions as shown on the drawings, be fabricated at a recognized fabrication workshop and be assembled on the job in accordance with the drawings

Before final fabrication of any steel the Contractor shall check the positions of holding down bolts. All Members shall be sawn to exact length or flame cut and ground off flush, and identification letters shall be ground off flush where these letters interfere with intimate contact between any section

No gas cutting on site shall be permitted except with prior approval of the Engineer

No permanent bolting or welding shall be done until proper alignment has been obtained and all finished members shall be true to line and free from twists, bends and open joints. Where joints are to be welded on site, all preparations shall be carried out before the parts are delivered to the site

Any necessary temporary cleats and bolts required for site erection and welding are to be supplied by the structural steel contractor

Where site connections or splices have not been specifically shown on the drawings, the position and design of these connections will be subject to the Engineers approval. No splicing of individual members shall be made without the Engineers approval

B01:04

HANDLING AND DELIVERY

Steelwork shall be handled by crane or other lifting machinery onto and off trucks and into position, and on no account shall material be thrown, dumped or otherwise mishandled. Take particular care not to Damage paint systems

All sections shall be clearly marked to facilitate erection, and on delivery to the site shall be carefully stacked if necessary

The contractor shall give the Engineer two days notice prior to structural steel painting and a further two days notice prior to delivery to site.

B01:04

ERECTION

The contractor shall check all seatings for steelwork to ensure that they are at the correct level, truly flat and in a condition to receive the steelwork. It shall be the Contractors responsibility to see that the steel work is accurately and correctly fixed.

Steelwork shall not be erected until the supporting concrete has been fully cured

Assembled parts shall be brought into close contact and drift pins shall be used only for bringing members into position, not to enlarge or distort holes. Field errors shall be corrected by grinding except with prior approval of the Engineer.

The contractor shall give his special attention to the handling of steel during erection; all work shall be securely bolted or otherwise fastened and, if necessary, temporarily braced to provide safety for all erection stresses and minimize distortion, including those due to erection equipment and operation.

The contractor shall be responsible for the safety of the structure during assembly. This responsibility shall not preclude the right of the Engineer to condemn erection techniques, or reject assembly cleats and bolts.

B01:05

WELDING

Welding shall conform to the requirements of NZS 4701: 1981 "Metal-arc Welding of Steel Structures" a copy of which shall be kept in the workshop. Operators shall be qualified in terms of NZS 4711: 1973. As much welding as possible shall be carried out in workshop conditions.

Weld Acceptance Level:

Pursuant to clause 1.4 of NZS 4701, the weld acceptance level be class A throughout

Inspection and Testing

The Engineer shall have free access to work being carried out by the contractor. Facilities shall be provided by the contractor for the Engineer at all times during welding, to inspect any layer of weld metal or preparation.

B01:06

HIGH STRENGTH BOLTS

High strength bolts, nuts and washers shall conform to AS 1252: 1973 General Grade High Strength Steel Bolts With Nuts and Washers For Structural Engineering (ISO metric series) Installation procedure will be specified to be in accordance with the following:

Snug-Tight Procedure

Bolts shall be snug-tightened by full effort of a man on a standard podger spanner. Washers need not be hardened

B01:07

COMMERCIAL GRADE BOLTS

Commercial grade bolts shall confirm to AS 1111: 1980. All bolts shall have one washer and one nut unless shown otherwise on the drawings. Installation procedure is the snug tightening method, as above

B01:08

TOLERANCES

All steel shall be level and plumb within the tolerance specified in NZS. 3404

B01:09

BASE PLATES

Allow to shim to level accurately and leave prepared grout space for other. Provide templates of all holding down bolts to concreter.

B01:10

GALVANISING

Components specified on the drawings as being galvanized are to be hot-dipped galvanized in accordance with AS 1650: 1981. All bolts exposed to weather shall be hot dip galvanized including hold down bolts.

B01:11

PAINTING

All steelwork shall be cleaned and primed before being dispatched from the fabrication shop. Unless otherwise specified, the following treatment shall be undertaken

(a) Steelwork not exposed to weather:

Flame clean, chip, and power wire brush to remove all scale and rust to pictorial standard St. 3 of Swedish Standard SIS 05 59 00.

Apply one good coat of an approved zinc rich primer

(b) Steelwork embedded in concrete

Steelwork to be embedded in concrete shall be cleaned as for part (a) above but shall not be painted

(c) Provide top coat (including intumescent fire protection) as required

B01:12

SUPERVISORS

The structural steelwork contractor shall employ on the work a person or persons who have had training and experience in the execution and supervision of this form of construction.

All fabrication and welding shall be carried out under this supervision

C01

SITE CLEARANCE, EXCAVATION AND FILLING

C01:01

GENERAL

SCOPE: This section deals with the clearance/excavation/filling as shown on:

REFER TO PRELIMINARIES, section A01 for items affecting this section. Also to be read in conjunction with Hutchinson Consulting Engineers Geotechnical Report July 2012

DOCUMENTS referred to in this section are:

NZS 3604 Light timber frame buildings not requiring specific design.

NZS 441:1989

Documents listed above and cited in the clauses which follow are deemed to form part of this specification.

However this specification takes precedence in the event of it being of a higher standard than the cited documents.

SITE VISIT: Visit the site and make all necessary investigations as to conditions.

C01:05

CLEARANCE

PREPARATION: Comply with NZS 3604 – Clause 3.4, Site preparation. Remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area to be built on.

TOPSOIL: Stockpile excavated topsoil on site where directed by the architect. Keep separate from other excavated materials. Spread and level where directed before completion of contract.

UNDERGROUND VOIDS/SERVICES/OLD FOUNDATIONS: Break out and remove old foundations, slabs, drainage pipes, manholes, tanks, cables, etc. Report to the architect for instructions when any unexpected voids, made-up ground or services are encountered. Seal off ends of drains to local authority approval.

C01:06

EXCAVATION

GENERAL EXCAVATION: Trim ground to required profiles, batters, falls and levels. Remove all non – engineered fill and weak organic alluvial soils to a competent material encountered below typically 1.2m below existing ground level and replace with compacted hardfill. Extend filled area to 1.0m outside the proposed building platform. Protect all cut faces from collapse. Keep all excavations free from water. General excavation is assumed to be in material other than rock.

EXCAVATION FOR FOOTINGS: All strip and or pad foundations should extend a minimum of 600mm below cleared ground. Trenches must be plumb and straight, bottoms level and solid, stepped as required and kept clean and free of water.

INADEQUATE BEARING: If, due to any cause, bearing becomes inadequate then excavate further, backfill and compact to approval with material as follows:

Below slabs on grade:	Hardfill
Below footings:	10 MPa concrete
Service trenches:	Hardfill

C01:07

FILLING

GRANULAR BASE FOR SLABS: To conform with Appendix E5, Granular Base, of NZS 3604. Consolidate with a vibrating roller. Blind the surface with coarse sand and roll ready to receive a polythene sheet vapour barrier.

GENERAL BACKFILLING: Use run of pit hardfill and GAP 40/65 materials, compacted in 200 mm layers. Each layer should be compacted using either a heavy sheep's foot or pad-foot roller to achieve an average undrained shear strength of 140kPa, with no shear strength less than 100kPa and a maximum of 10% air voids.

C01:08

COMPLETION

SURPLUS MATERIAL: Remove and dispose off the site any surplus excavated material including that excavated for drains.

D01

MASONRY

D01:01

GENERAL

SCOPE: This section deals with the construction of Masonry block work, reinforcing, mixes and the placing of concrete.

REFER TO PRELIMINARIES: Section A01 for items affecting this section.

NZ BUILDING CODE: Follow the Approved Documents with regard to the criteria and/or methods that must be used in this section to establish compliance with the Code.

B1/AS1	Structure – general 2.0 Concrete
B1/AS3	Structure – small chimneys
B1/AS4	Structure – foundations 1.0 Foundations for small buildings
E2/AS1	External moisture 4.0 Floors 5.0 Basements

DOCUMENTS referred to in this section are:

NZS 3104	Concrete production – high grade and special grade
NZS 3108	Concrete production – ordinary grade
NZS 3109	Concrete construction
NZS 4201	Masonry construction
NZS 3124	Concrete construction for minor works
NZS 3402	Steel bars for the reinforcement of concrete
NZS 4229	Concrete Masonry Buildings Not Requiring Specific Engineering Design
NZS 3604	Light timber frame buildings not requiring specific design

Documents listed above and cited in the clauses which follow are deemed to form part of this specification.

However this specification takes precedence in the event of it being of a higher standard than the cited documents.

D01:02

MATERIALS

GENERAL: All materials shall to comply with provisions of NZS 4201.

REINFORCEMENT: Reinforcing Steel shall comply with provisions of NZS 3403, Grade 200 deformed bars. Reinforcing mesh shall comply with provisions of NZS 3422. Bends, hooks and other details of reinforcement shall be accordance with NSZ3109

READY-MIX CONCRETE: High grade 20 MPa, maximum aggregate size 19 mm to NZS 3109.

GROUT: Masonry grout used for block filling of cells shall comply to the provisions of 12.5 and NZS4201.

D01:03

WORKMANSHIP

GENERALLY: Workmanship and construction to comply with NZS 4210 and NZS 3604.

INSPECTION: Place no concrete until all masonry, boxing and reinforcing have been inspected and passed by both the architect and Territorial Authority Inspector.

CONSTRUCTION: Construction shall be carried out by a suitably qualified tradesperson. The permissible tolerances shall be as set out in NZS 4201.

FORMWORK: To be securely fixed and braced, have sufficient strength to support all loads and with joints and linings tight enough to prevent loss of water.
Hose out to clean thoroughly and keep wet before and after concrete is placed.

D01:04

SURFACE COATING:

External vertical masonry walls, except veneer walls, shall be waterproofed by the application of a surface coating that shall extend at least 50mm past the top level of the adjoining floor slab.

An alkali resistant water based dispersion coating system, having a dry film thickness of between 180 and 250 micrometers shall deem to comply with this requirement. This shall be achieved by 2 to 3 coats depending on the product used and texture of the surface.

The surface coating shall not be applied until the moisture content of the wall is below 70% relative humidity and is suitable of application of the paint

D01:05

MAINTANCE

The completed coating system shall be regular maintained to ensure continued resistance to water entry. Maintance shall include the removal of dirt, mould and other organic deposits, the repair of cracks and or other defects and the repainting as necessary to preserve the waterproof finish.

E01

CONCRETE WORK

E01:01

GENERAL

SCOPE: This section deals with the formwork, reinforcing, mixes and the placing of concrete in buildings and in landscaping.

REFER TO PRELIMINARIES: Section A01 for items affecting this section.

NZ BUILDING CODE: Follow the Approved Documents with regard to the criteria and/or methods that must be used in this section to establish compliance with the Code.

B1/AS1	Structure – general 2.0 Concrete
B1/AS3	Structure – small chimneys
B1/AS4	Structure – foundations 1.0 Foundations for small buildings
E2/AS1	External moisture 4.0 Floors 5.0 Basements

DOCUMENTS referred to in this section are:

NZS 3104	Concrete production – high grade and special grade
NZS 3108	Concrete production – ordinary grade
NZS 3109	Concrete construction
NZS 3114	Concrete surface finishes
NZS 3124	Concrete construction for minor works
NZS 3402	Steel bars for the reinforcement of concrete
NZS 3422	Welded fabric of drawn steel wire for concrete reinforcement
NZS 3604	Light timber frame buildings not requiring specific design

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However this specification takes precedence in the event of it being of a higher standard than the cited documents.

E01:02

MATERIALS

GENERAL: All materials for concrete work to comply with NZS 3109.

FORMWORK:

Framing	No 2 Framing radiata pine
Boards	No 2 Framing radiata pine
Rigid Sheets	Construction plywood CP-D grade Hardboard

REINFORCEMENT: Concrete floor slabs constructed on 'good ground' must be reinforced with a minimum of 2.27 kg/m² of grade 500E reinforcing mesh fabric that conforms with AS/NZS 4671:2001 *Steel reinforcing materials*

VAPOUR BARRIER: 0.25 mm minimum polythene to NZS 3604 Section 7.5.

READY-MIX CONCRETE: High grade 25 MPa, maximum aggregate size 19 mm to NZS 3104.

SITE WORKS CONCRETE: 1:8 – cement: all-in aggregate with minimum water for workability, all materials and batching to NZS 3108.

E01:03

WORKMANSHIP

GENERALLY: Workmanship and construction to comply with NZS 3109 and NZS 3604.

INSPECTION: Place no concrete until all excavations, boxing and reinforcing have been inspected and passed by both the architect and Territorial Authority Inspector.

FORMWORK: To be securely fixed and braced, have sufficient strength to support all loads and with joints and linings tight enough to prevent loss of water.
Hose out to clean thoroughly and keep wet before and after concrete is placed.

VAPOUR BARRIER: Apply polythene with 150 mm laps, tape sealed to laps and penetrations.

REINFORCEMENT: To comply with NZS 3109. Bends to be made cold, without fracture. All reinforcing to be accurately placed and well secured against displacement. Do not weld reinforcement.

FLOOR SLAB: Construct in accordance with NZS 3604 Section 7.5. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled to a Class U3 NZ 3114 finish. Tolerance on flatness to be a maximum 3 mm gradual deviation over a 3 metre straight-edge.

SAW CUTS: Cut slabs where shown on drawings and as require to control shrinkage cracking. Cutting to be carried out as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred. This will generally be within 72 hours of pouring. Where saw cuts are to be made, cut out 100 mm of every second wire of the mesh for a length of 50 mm each side of the saw cut position.

EXPOSED CONCRETE: Provide formwork with board/smooth plywood/hardboard linings where the finish is exposed. Surface finish to be F4/F5/F6 for surface tolerance, colour variation, physical irregularities and surface dressing as required by NZS 3114. Discuss with and obtain approval from the architect of the type of joint to be used.

CASTING IN: Allow to build in all grounds, holding down bolts, pipes, sleeves etc as required by the various trades and as shown on the drawings, prior to pouring the concrete.

E01:04

COMPLETION

CLEAN OUT saw cuts after a period of not less than six weeks, and fill with cement grout where the floor will be covered with carpet or vinyl. Where the slab is exposed fill joints with gun-grade sealant over a back-up of PEF rod in accordance with manufacturer's recommendations.

CURING OF CONCRETE: Protect fresh concrete from premature drying and extremes of temperature. Use suitable methods to limit evaporative drying and keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, ponding, or the application of a curing membrane. Make sure any membrane used will not affect subsequent applied finishes.

F01

CARPENTER

F01:01

MATERIALS

ALL MATERIALS are to be new of high quality and of a type and grade suitable for their intended purpose. Timber shall be to the sizes shown on the drawings but in no case shall be smaller than the size specified in NZS 3604 for the purpose. Finishing timbers for paint work may be finger jointed. Finishing timber for varnish work shall be clear dressing grade to the species selected by the owner.

TIMBER shall be treated in accordance with the hazard rating suitable for their use in accordance with NZS 3602: 2003. Timber and wood based products for use in buildings.

ALL STEEL FIXINGS AND FASTENINGS (excluding nails) to be in compliance with NZS 3604 table 4.1 (enclosed).

- Typically Rodney is classed zone 1.
- Sea spray zones extend 500 m from mean high tide mark.

ALL NAILS to comply with NZS 3604 table 4.3 (enclosed).

- Typically Rodney is classed zone 1.
- Sea spray zones extend 500 m from mean high tide mark.

F01:02

CONSTRUCTION

ALL TIMBER CONSTRUCTION shall be carried out in accordance with NZS 3604.

ALL FRAMING and finishing timbers to be laid true to their various lines and levels and constructed in a proper tradesmanlike manner, to make the whole of the works a sound construction.

TREATMENT LEVELS

Exterior wall framing - H1.2: Sub floor - H1.2: Enclosed Framing in flat roofs, decks, balustrades, - H3.1: Unroofed decking, external stairs, handrails, balustrades and top & bottom plates, - H3.2: Piles and other structural in ground material, - H5:

ALL TIMBER WORK abutting or resting on masonry units, concrete or brickwork is to be protected with Thermakraft Supercourse 500 damp proof course.

F01:03

EXTERIOR FINISH

ALL EXTERIOR JOINERY, exterior timber linings or trim shall be treated and all end grain joints are to be given a coat of primer stain prior to fixing.

EXTERIOR CLADDINGS to be installed with manufacturer's specifications and standard details. 20 series Masonry block units

SHEET CLADDING to be fixed plumb and square in accordance with manufacturer's specifications.

EXTERIOR DOORS shall be fitted and hung as per supplier's instruction.

GO 9.4 TIMBER WEATHERBOARDS

Timber weatherboard claddings shall be either direct fixed to framing over a building wrap or fixed over a drained cavity as described in Paragraph 9.1.8. Based on the risk score for an external wall calculated as per Paragraph 3.1, the weatherboard cladding may require the inclusion of a drained cavity.

9.4.1 Limitations

9.4.1.1 Weatherboard profiles

This Acceptable Solution is limited to the following types of timber weatherboards:

- a) Horizontal bevel-back,
- b) Horizontal rebated bevel-back,

Profiles shall be as given in NZS 3617 or BRANZ Bulletin 411.

9.4.1.3 Horizontal weatherboards

Horizontal weatherboards shall be either direct fixed or fixed over a drained cavity, according to the risk categories as shown in Table 3.

9.4.2 Materials

Timber weatherboard cladding shall include the following features:

- a) Building wrap or rigid sheathing complying with Table 23, and
- b) Timber selection and treatment of weatherboards in accordance with NZS 3602.

9.4.3 Installation

A building wrap, complying with Table 23 shall be installed behind:

- a) All direct fixed timber weatherboards, or

9.4.3.1 Fixings

Fixings shall comply with Tables 20 and 24. Timber weatherboards shall be drilled for nailing at all joints and ends. All cut ends of painted weatherboards shall be primed.

9.4.4 Horizontal weatherboards

9.4.4.1 Horizontal laps

Laps shall be:

- a) 32 mm for non-rebated bevel-back boards, or
- b) 25 mm horizontal lap for rebated bevel-back and rusticated boards, with a minimum gap of 2 mm at the overlap between boards.

9.4.4.2 Joints

Joints shall be made only over supports and have:

- a) Corrosion-resistant soakers fitted, complying with Paragraph 4.3.2 to Paragraph 4.3.6, or
- b) Scarf or splay joints.

9.4.4.3 Fixings

Boards shall be fixed through the building wrap

9.4.4.4 External corners

External corners shall be weatherproofed by one of the following methods:

- a) For rusticated and bevel-back weatherboards, corner boxes with:
- ii) plugs or scribes for rusticated weatherboards, as shown in Figure 78,

9.4.4.5 Internal corners

Internal corners shall be made weathertight as shown in Figure 79. A corrosion-resistant flashing shall be fitted behind direct fixed weatherboards at all internal corners as shown in Figure 79.

9.4.8 Parapets and enclosed balustrades

Parapets shall be in accordance with Paragraph 6.0. Enclosed balustrades shall be in accordance with Paragraph 7.4.

9.4.9 Finishes

Where a protective finish is required by NZS 3602, all timber surfaces, including end grain and laps, shall be sealed by priming. Two coats of exterior grade paint shall be applied, after priming, to all exposed surfaces. Paint systems shall comply with any of Parts 7, 8, 9 or 10 of AS 3730.

H01

ALUMINIUM WINDOWS/DOORS

H01:01

GENERAL

SCOPE: This section deals with the manufacture, supply, glazing and installation of aluminium windows and doors.

REFER TO PRELIMINARIES: Section A01 for items affecting this section.

NZ BUILDING CODE: Refer to the following NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the Code.

E2/AS1 External moisture
 3.0 Exterior joinery

THE DOCUMENTS referred to in this section are:

NZS/AS 1231 Aluminium and aluminium alloys – Anodized coatings for architectural applications.
NZS 3503 Anodic oxide coatings on aluminium external applications.
NZS 3504 Aluminium windows
NZS 4211 Performance of windows
NZS 4223 Glazing in buildings, parts 1 and 2
BS 6496 Specification for powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes and for the finish on aluminium alloy components coated with powder organic coatings.
Architectural Aluminium Association: Aluminium Window Handbook, and Specification for the powder organic coatings on architectural aluminium products.

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However, this specification takes precedence in the event of it being of a higher standard than the cited documents.

SUBMIT samples on request of full size sections with the selected finish and hardware through all profiles offered. Provide evidence at time of tender from a TELARC registered laboratory that windows offered comply with the requirements of NZS 3504 and the required site and building Design Wind Pressure and Air Leakage level to NZS 4211.

GUARANTEE this work under normal conditions of use against failure of

- materials and
- workmanship for two years from date of practical completion.

Make out in Employer's name. Submit to Architect for comment and obtain approval before commencing this work.

H01:02

MATERIALS

ALUMINIUM WINDOWS AND DOORS: To comply with NZS 3504 and to have security beading.

OR

CONTRACTOR to nominate brand and type for the Architect's approval prior to acceptance of the tender. The architect reserves the right to reject any brand and request nomination of alternatives.

ANODISED FINISH: To NZS/AS 1231 with a minimum thickness of 12.5 microns. Colour to match approved sample.

ORGANIC POWDER COATING FINISH: To BS 6496 and AAA specification with a minimum thickness of 40 microns. Use polyester powders capable of in-site re-coating. All finished surfaces to show uniformity of gloss and colour (to match approved sample) free of all painting defects.

SHEET GLASS: To be OQ and in thickness to suit sash and light size.

SEALANT: To manufacturer's recommendation.

H01:03

WORKMANSHIP

GENERALLY: Workmanship to be in accordance with best trade practice and properties to requirements of NZS 4211.

AVOID DISTORTION of components during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any components which cannot be immediately unloaded into suitable conditions of storage.

CORROSION PROTECTION: Before fixing, apply suitable barriers of bituminous coatings, slips or underlays between dissimilar metals in contact or aluminium in contact with concrete.

FLASHINGS: Install flashings to heads, jambs and sills of frames as supplied and recommended by the window manufacturer, and as detailed on the drawings. Head flashings finished to match windows.

FIX FRAMES: Rigidly fix in place without distortion to manufacturer's and Aluminium Window Handbook recommendations plumb, true to line and face, weathertight and with all openings operating freely.

SEAL FRAMES to adjoining structure where necessary as recommended by manufacturer to make weathertight.

RETAIN PROTECTIVE COVERINGS and coatings in place during fixing wherever possible. Provide additional protection as necessary to prevent marking of surfaces which will be visible in completed work. Keep paper and cardboard wrappings on aluminium components dry. Remove protection on completion unless designed to remain in place.

H01:04

COMPLETION

ON COMPLETION, remove temporary protection and thoroughly clean down both sides of all aluminium and glass, using method recommended by manufacturer. Protect glass from damage by crossing cleanly visible tape between jamb liners and clear of the glass.

J01

RESCO COMPACT LAMINATE TOILET & SHOWER PARTITIONS

J01. GENERAL

This section relates to the supply and installation of RESCO compact laminate systems, using proprietary, prefabricated toilet partitions and screens.

J01.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

IS EN 438-4 High-pressure decorative laminates (hpl) - sheets based on thermosetting resins (usually called laminates) - part 4: Classification and specifications for compact laminates of thickness 2 mm and greater Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
RESCO product brochures. Copies of the above literature are available from RESCO NZ Ltd.
Web: www.resco.co.nz Email: sales@resco.co.nz Telephone: 07 850 1025

1.3 NO SUBSTITUTIONS

Substitutions are not permitted to any specified RESCO brand products, components or accessories.

1.4 QUALIFICATIONS

Installers to be experienced, competent and familiar with the materials and techniques specified. Installation to RESCO shop drawings and RESCO Installation Manual current at the time of installation.

1.5 SHOP DRAWINGS

Provide RESCO shop drawings and RESCO Installation Manual for the project. Refer to the general section for timing and review requirements.

1.6 SAMPLES

Submit on request samples of RESCO panels and components for approval of colour and finishes.

1.7 WARRANTY - MATERIALS

Provide RESCO NZ Ltd warranty. 10 years: Compact laminate panel integrity 2 years: Hardware
- Provide this warranty on the RESCO NZ Ltd standard form.
- Commence the warranties from the date of completion.

2. PRODUCTS

Materials - RESCO Series 7000 toilet/shower partitions

2.8 PARTITION PANELS

13 mm pre-finished compact laminate panels made from thermo-setting resins to IS EN 438-4. Refer to SELECTIONS for colour and length options.

2.9 ALUMINIUM TRIM - HEAD RAIL

Powder coated oval 120 mm x 50 mm extruded aluminium 6060 alloy A-863 headrail.
Refer to SELECTIONS for colour option.

2.10 ALUMINIUM TRIM - DOOR STILES

Powder coated 70 mm extruded aluminium 6060 alloy full length tubular A-862 door stiles with clashing rebated door stops lined with wool pile. Top of door stiles to be 4 x screw fixed to headrail and 1 x screw fixed to floor spigot. Refer to SELECTIONS for finish and colour.

2.11 ALUMINIUM TRIM - WALL CHANNELS

Powder coated continuous full height extruded aluminium 6060 alloy A-866 wall channels. Refer to SELECTIONS for Dulux powder coat colour option.

2.12 DOORS

13 mm compact laminate doors with polished bull-nose machined edges.

2.13 HARDWARE PER DOOR

3 stainless steel drop hinges, 1 silver satin indicator bolt and keeper, 1 chrome brushed doorstop/door hook.

3. EXECUTION

3.1 HANDLE AND STORE

Handle and store all components, panels and accessories to avoid damage. Keep dry in transit. Store clear of and on a level floor and cover for protection.

3.2 SUBSTRATES AND PLUMBING FITTINGS CHECK

Before commencing installation of the RESCO system ensure all substrates are plumb, level and in true alignment, all flooring surfaces are ready and all plumbing fittings are properly positioned. Ensure adequate provisions are made for fixing to relevant walls. Ensure that the back wall is sufficiently solid to support the suspended Multicube® system.

3.3 PROTECT

Protect adjoining areas, surfaces and finish from damage.

3.4 INSTALL

Carry out the installation to the requirements of RESCO NZ Ltd, relevant shop-drawings and the latest version of RESCO Installation Manual for the project.

3.5 REPLACE

Replace any damaged or marked elements.

3.6 LEAVE

Leave work with parts fully and freely working and to the standard required by RESCO NZ Ltd.

3.7 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 TOILET/ CUBICLE PARTITIONS

Brand: RESCO System type: Series 7000 Panel description: 13 mm pre-finished compact laminate panel

Panel colour: As selected by client Aluminium trim: Powder coated, ~

Toilet size: 850 mm width x 1560 mm length

Shower size: 900 mm width x 1875 mm length

• *Users of this section shall rely solely on their own professional judgement and skill in determining the appropriateness of using or referring to this section and to satisfy themselves as to the accuracy of the data it contains.*

• *Users acknowledge that neither Construction Information Limited nor the manufacturer of the products and systems described in the text are in any way liable in respect of any particular use or application of the material provided.*

K01. GENERAL

This section relates to the supply and installation of RESCO Multicom® pre-finished proprietary wall panelling system for:

- wet and damp locations
- high impact areas
- high hygiene areas

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

IS EN 438-4 High-pressure decorative laminates (hpl) - sheets based on thermosetting resins (usually called laminates) - part 4: Classification and specifications for compact laminates of thickness 2 mm and greater Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

RESCO Installation Instructions

Copies of the above literature are available from RESCO NZ Ltd.

Web: www.resco.co.nz Email: sales@resco.co.nz Telephone: 07 850 1025

1.3 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification: MS Modified silicone

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified RESCO brand products, components or accessories.

1.5 SAMPLES

Submit on request samples of panels and components for approval of colour and finishes.

1.6 QUALIFICATIONS

Installers to be experienced, competent and familiar with the materials and techniques specified. Install to RESCO Installation Instructions current at the time of installation.

1.7 WARRANTY - MATERIALS

Provide the RESCO warranty.

10 years: For the compact laminate panel's integrity and aluminium jointers

- Provide this warranty on the RESCO standard form.
- Commence the warranties from the date of completion.

K02. PRODUCTS

Materials

2.1 WALL PANELS

6 mm compact laminate panels made from thermo-setting resins to IS EN 438-4. The phenolic resin core is pre-finished on both sides with a melamine resin surface finish. Refer to SELECTIONS for colour options.

2.2 JOINTERS AND CORNER PROFILES

Selected extruded aluminium 6060 alloy full length aluminium powder coated jointers and corner profiles to suit application. Refer to SELECTIONS for channel colour options.

2.3 DOUBLE-SIDED TAPE

1 mm Multicom® double sided tape.

2.4 ADHESIVE

MS polymer adhesive.

2.5 PROFILE FIXING

Use fit for purpose stainless steel screws.

3. EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store panels and accessories to avoid damage. Keep dry in transit, store clear of and on a level floor and cover for protection.

3.2 SUBSTRATES CHECK

Before commencing installation of the RESCO Multicom® system ensure all substrates are plumb, level and in true alignment.

3.3 PROTECT

Protect adjoining areas, surfaces and finish from damage.

3.4 INSTALL BATTENS

Use non-corrosive fixings to fix 18 mm x 40 mm H3.1 battens @ 600 mm centres on a concrete block wall.

3.5 INSTALL ALUMINIUM JOINTERS AND CORNER PROFILES

Install aluminium jointers and corner profiles as required to the requirements of RESCO NZ Ltd and RESCO Installation Instructions.

3.6 ACTIVATOR SOLUTION

Wipe all surfaces with activator solution that will be in contact with MS Polymer adhesive.

3.7 DOUBLE-SIDED TAPE

Fix continuous full height double-sided tape to wall areas, to hold panels while MS Polymer adhesive cures.

3.8 MS POLYMER

Apply a continuous full height 5 mm bead of MS Polymer adhesive to areas where wall panelling to be fixed.

3.9 INSTALL PANELS

Dry fit every RESCO Multicom® sheet before applying double-sided tape and MS Polymer adhesive. Allow for a 3 mm expansion clearance between profiles and panel edges. Carry out the fixing, erection and fitting to finish rigid, plumb, true to line and best practice, to the requirements of RESCO NZ Ltd and RESCO Installation Instructions. The panels can be cut with a skill saw using fine-tooth tungsten tipped blade. Completion

3.10 REPLACE

Replace damaged or marked elements.

3.11 LEAVE

Leave work to the standard required by RESCO NZ Ltd.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

K04. SELECTIONS

4.1 WALL PANELS

Brand: RESCO

Type: Multicom®

Panel description: 6 mm pre-finished compact laminate wall-panel

Panel size: 2440 mm x 1840 mm x 6 mm

Panel colour: ~

Aluminium colour: Powder coated to match panels

- *Users of this section shall rely solely on their own professional judgement and skill in determining the appropriateness of using or referring to this section and to satisfy themselves as to the accuracy of the data it contains.*
- *Users acknowledge that neither Construction Information Limited nor the manufacturer of the products and systems described in the text are in any way liable in respect of any particular use or application of the material provided*

SCOPE: This section deals with the supply and fixing of the roof coverings shown on the drawings, complete with all necessary accessories to make a watertight roof.

Refer to section 502 for flashings gutters and rainwater pipes.

REFER TO PRELIMINARIES, section A01 for items affecting this section.

NZ BUILDING CODE: Refer to the following NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the Code.

E2/AS1 External moisture
1.0 Roofs

DOCUMENTS referred to in this section are:

NZS 2995	Building papers (breather type)
NZS 3403	Hot dipped galvanised corrugated steel sheet for building purposes.
NZS 3441	Hot dipped zinc-coated steel coil and cut lengths.
NZS 3602	Specifying timber and wood-base products for use in building.
NZS 3604	Light timber frame buildings not requiring specific design.
NZMP 3640	Minimum requirements of the NZ Timber Preservation Council.
NZS 4206	Concrete interlocking roofing tiles.
NZS 4217	Pressed metal tile roofs.
NZS 4234	Cellulose cement products – corrugated sheets for roofing and cladding.

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However this specification takes precedence in the event of it being of a higher standard than the cited documents.

WIND AND EARTHQUAKE LOADINGS: Use fixings and methods that will be capable of sustaining the loads appropriate to the area as set out in NZS 3604.

ROOFER QUALIFICATION: Carry out all roofing work with experienced competent roofers familiar with the materials and techniques specified.

GUARANTEE: Provide written warranties for work in this section for coating 10 years, for material 25 years and for workmanship 2 years. Make out in name of Employer, date from Practical Completion and provide before commencing the work.

CO-ORDINATE with main contractor to ensure sub-strate and preparatory work is complete and other work programmed in the order require for access and completion of the roof. Co-operate with the Plumber with regard to penetrations, flashings and water collection system. Check that all preparatory work is satisfactory for the proper and waterproof application of the roof covering. Arrange for Contractor to bring sub-strate and preparatory work up to the required standard before commencing work.

M01:02**MATERIALS**

BUILDING PAPER: Breather type flame retardant kraft paper laminates to NZS 2295. (Thermakraft 354)

WIRE NETTING: 75 mm hexagon mesh of 1 mm diameter galvanised steel wire in 900 mm wide sheet.

PROFILED METAL ROOFING: Steel sheet galvanised to NZS 3403 (0.55mm Trimline Colorsteel)

Brand see drawings Accessories, cappings, flashings and fixings to match and to manufacturer's recommended practice.

M01:05**WORKMANSHIP**

STACK ROOFING and accessories on clean level areas of the site and protect from damage and from weather until ready to fix in place.

SET OUT the planned layout before fixing commences to ensure true lines, correct relationship to module, grid and roof features.

BUILDING PAPER: Lay and fix to NZS 3604, manufacturer's recommendations and relative to requirements of the roofing.

PRIME LAPS of galvanised steel and other metal roofing both upper and lower face.

CUT PROFILED METAL ROOFING and fix complete with all matching accessories, flashed to all roof features and penetrations and all to manufacturer's instructions.

FIX THE BATTENS to roofing manufacturer's requirements and with all joints fully supported and staggered.

M01:08**COMPLETION**

LEAVE this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeded so that the finished roof is completely weathertight.

REMOVE all trade rubbish and unused materials from the roof and surrounds regularly during the work as well as at completion. Sweep down the completed roof and clean out all spouting and rainwater pipes.

N01.9 STEEL AND TUBE ROOFING

1. GENERAL

This section relates to the supply and fixing of proprietary overlap rigid sheet metal profiled roofing, complete with accessories.

1.1 DOCUMENTS

Documents referred to in this section are:

AS/NZS 4534 Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM NZ Metal roofing & wall cladding - Code of practice

Steel and Tube Roofing Products:

Product Guide May 2003

Design Solutions

Spring Curved Custom Orb Design Manual

NZ Steel Installers Guide September 2003

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Roofing Solutions CD

Copies of the above literature are available at

Web: <http://www.stroofing.co.nz/>

Telephone: 0800 333 247

1.3 QUALIFICATIONS

Roofers to be **Steel and Tube Roofing Products'** Approved Installers. A list of approved installers can be obtained at www.stroofing.co.nz, by telephoning Freephone 0800 333 247 or from the local **Steel and Tube Roofing Products** branch.

1.4 WARRANTY

Warrant this work under normal environmental and use conditions against failure.

Perforation: 15 years minimum

Coatings: 10 years minimum

Workmanship: 5 years

From: Date of installation.

Provide warranties on **Steel and Tube Roofing Products** standard **Warranty Plus** warranty form.

1.5 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

1.6 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile to the primary structure.

1.7 PERFORMANCE

Install roofing material and associated flashings and accessories to form a weather tight and durable system.

N02. PRODUCTS

Roofing

2.1 STEEL & TUBE ROOFING

Refer to SELECTIONS / drawings.

2.2 FLASHINGS GENERALLY

Formable grade 0.55 BMT for galvanized, aluminium/zinc and pre-coated steel, and aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to **Steel and Tube Roofing Products** Design Solutions.

2.3 FLASHINGS BEHIND BUILDING ELEMENTS

Flashing material and gauge to meet NZBC 50 year durability requirements for flashings behind building elements that are difficult to access or replace. Refer to SELECTIONS for location and type.

Underlays

2.4 WIRE NETTING

Galvanized hexagonal 75 mm mesh from 1 mm steel wire to AS/NZS 4534.

2.5 UNDERLAY

Breather type kraft paper.

Components

2.6 FASTENERS GENERALLY

Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

2.7 FIXING CLIPS

Galvanized steel or aluminium/zinc to suit the material and profile of the rigid sheet and location as required by **Steel and Tube Roofing Products**. Fix to steel with 16 mm x 10 gauge galvanized wafer head self-drilling screws and to timber with 50 mm long x 4.5 mm galvanized spiral rolled flat head nails.

2.8 FIXING SCREWS

Screws appropriate to the roofing material and the supporting member, as recommended by **Steel and Tube Roofing Products**.

2.9 RIVETS

Sealed aluminium, minimum diameter 4 mm.

2.10 SEALANT

Steel & Tube neutral curing silicone or MS polymer sealant used as directed.

2.11 CLOSURE STRIPS

Compressible, profiled, closed cell foam strips to fit the sheet profile.

2.12 LAP SEALING TAPE

Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

N03. EXECUTION

3.1 INSPECTION

Inspect the roof framing and supporting structure to ensure that it is complete and ready for roofing. Do not start work until all requirements are complete to the required standard.

3.2 STORAGE

Take delivery of and accept packs of roofing undamaged on delivery. Reject all damaged material. Store on a level firm base with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air movement between sheets.

3.3 HANDLING

Avoid distortion and contact with damaging substances, including cement and swarf. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage. Use soft, flat soled shoes when fixing and for all other work on the roof.

3.4 SEPARATION

Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by painting the surfaces or \ fitting separator strips. Place isolators between metals and treated timber or cement based materials. Do not use unpainted lead sheet or copper in contact with or allow water run-off onto galvanized or Zinalume® materials.

Application

3.5 SET-OUT

Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.

3.6 END LAPS

Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

3.7 WIRE NETTING

Fix wire netting where specified, drawn tight and nailed or screwed to purlins with edges butted and twitched together to form a complete net.

3.8 LAY ROOF UNDERLAY

Lay underlay horizontally or vertically with a 150 mm side lap, oversailing the spouting and/or gutters by 10 – 20 mm. Fit and lap roofing underlay over the netting to the underlay manufacturer's requirements.

3.9 AVOID DAMAGE

Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

3.10 MARKING AND CUTTING PROFILED METAL ROOFING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

3.11 INSTALLING PROFILED METAL ROOFING

Install and fix in accordance with NZ Steel's Installers Guide and to **Steel and Tube Roofing Products'** Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.

Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant. Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

3.13 FIXINGS

Refer to the roofing manufacturer's literature for fixing details, taking particular care in the higher wind uplift areas identified in NZS 3604, figure 10.17.

3.14 INSTALL FLASHING

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

3.15 VALLEYS

Form valleys as detailed and required by **Steel and Tube Roofing Products**, ensuring the valleys provide a weathertight and neat appearance.

3.16 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

3.17 CHANGE OF PITCH

Provide a notched or soft-edged apron flashing where an upper roof discharges onto a lower roof of lesser pitch.

3.18 USE OF SEALANTS

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

3.19 ENSURE COMPLETE

Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

3.20 REMOVE FILINGS

Remove metal filings from roofing surfaces at least daily.

3.21 REMOVE

Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spoutings, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

3.22 REPLACE

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

3.23 LEAVE

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

N04. SELECTIONS

Roofing

4.1 STEEL AND TUBE ROOFING

Profile name: Trimline

Material: Colorsteel

BMT: 0.55 mm

Colour: Selected by client

4.2 STEEL AND TUBE TRANSLUCENT SHEETING

Brand: Alsynite

Product: ~

4.3 UNDERLAY
Brand/Type: Thermakraft Covertex 407

4.4 FOIL
Brand/Type: Thermakraft

4.5 NETTING
Brand/Type: Thermakraft

4.6 FLASHINGS

<u>Type/location</u>	<u>Material/BMT/colour</u>
General ~	
Hidden ~	
Exposed ~	
Sheltered ~	

4.7 PIPE FLASHINGS
Brand/Type: Dektite

4.8 PROFILED FOAM STRIPS
Brand/Type: Ecofoam

P01

PLUMBING

P01:01

GENERAL

SCOPE: This section describes the supply and fitting of roof stormwater collection, flashings, waste disposal, water supply and plumbing fittings.

REFER TO PRELIMINARIES, Section A01 for items affecting this section.

NZ BUILDING CODE: Refer to the following NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the Code.

G1/AS1	Personal hygiene
	2.0 Fixture construction and installation
	3.0 Location of sanitary fixtures
G12/AS1	Water supplies
G13/AS1	Foul water – sanitary plumbing

DOCUMENTS referred to in this section are:

AS/NZS 3500 Plumbing & Drainage

NZS 3441 Hot-dipped zinc-coated steel coil and cut lengths.

NZS 3501 Copper tubes for water, gas and sanitation.

NZS 4602 Low pressure copper thermal storage electric heaters.

NZS 7641 Unplasticised pvc waste and ventilating pipe, fittings and accessories 32, 40 and 50 mm.

CSA B137-8 Polybutylene (PB) piping for hot and cold water distribution systems.

AS 1804 Soft lead sheet and strip

Plumbers, Gasfitters and Drainlayers Act, 1976

BRANZ Bulletin 304 Flashing design

BRANZ Bulletin 305 Domestic flashing installation

NZS 4610 Septic tank and drainage fields – TP58 “on site wastewater disposal”

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However, this specification takes precedence in the event of it being of a higher standard than the cited documents.

COMPLY with the NZ Building Code and Network Utility operator’s requirements for inspections and carry out tests as required.

ALL WORK covering waste disposal, water supply and plumbing fittings to be carried out by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act.

P01:02

MATERIALS

SPOUTING, PLASTIC: Profile, jointing, brackets and fittings brand-matched and complete to manufacturer’s specification.

FLASHINGS: 0.60 mm sheet steel galvanised to NZS 3441, 1.8 mm (20 kg/m²) copperised pure led to AS 1804, 0.50 mm copper sheet and 0.70 mm aluminium sheet to location, compatibility and design requirements of BRANZ Bulletin 304.

P01:05

WORKMANSHIP

GENERALLY carry out the whole of this work and tests to acceptable solutions E1/AS1, G12/AS1 and G13/AS1.

AVOID electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

SPOUTINGS, PLASTIC: Fit brackets, set to falls to outlets, solvent welded "o"-ring jointed complete with all fittings to manufacturer's recommendation.

DOWNPIPES, PLASTIC: Screw fix brackets, set plumb and clear of the wall, solvent welded and discharge into stormwater bends.

FLASHINGS: Scribe fit, fold, lap, seam, run solder or braze as required by the metal to flash roof penetrations, roofing and exterior joinery to prevent weather penetration. Install and fix flashings and flashing joints to the criteria stated in BRANZ Bulletin 305.

P01:08

COMPLETION

GENERALLY: Leave all rainwater services in proper working order and all flashing work keeping building weathertight. Pressure test all water supply services and fittings and check all waste disposal services ensure no leakage and leave all in proper working order.

CLEAN UP: Remove labels and clean all fittings. Take away from the site all rubbish and trade waste.

Q01

DRAINAGE

Q01:01

GENERAL

SCOPE: This section describes the supply and laying of foulwater, stormwater and field drains.

REFER TO PRELIMINARIES, section A01 for items affecting this section.

NZ BUILDING CODE: Refer to the following NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the Code.

B1/AS1	Structure – general 6.0 Drains
E1/AS1	Surface water 3.0 Drainage system materials and construction.
G13/AS2	Foul Water – drainage.

DOCUMENTS which relate to this section are:

AS/NZS 3500 Plumbing & Drainage

NZS 3108 Concrete production, ordinary grade

NZS 3302 Ceramic pipes, fittings and joints

NZS 4452 Construction of underground pipe sewers and drains

NZS 7643 Installation of unplasticised pvc pipe systems

NZS 7649 Unplasticised pvc underground drain pipes and fittings

NZS/AS2033 Installation and polyethelene pipe systems

BS 416 Cast iron spigot and socket soil waste and ventilating pipes (sand cast and spun) and fittings

BS 1196 Clayware field drain pipes and junctions.

Plumbers, Gasfitters and Drainlayers Act 1976.

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However, this specification takes precedence in the event of it being of a higher standard than the cited documents.

COMPLY with the NZ Building Code, and the network utility operator's requirements. Give notices for inspections and carry out tests are required.

SUPPLY a 1:100 scale as-laid plan of drains and fittings to network utility operator and architect at completion.

ALL WORK: To be carried out by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act.

Q01:02

MATERIALS

FILL: Scoria or crushed rock of General all-passing 40 grading.

CONCRETE: 17.5 MPa and 20 MPa ordinary grade to NZS 3108.

UPVC PIPES, bends, junctions, fittings and joints to NZS 7649.

PVC PIPING for field drains perforated and coiled.

GENERALLY: Carry out the whole of this work to NZS 4452 and NZS 7643 as modified by B1/AS1.

EXCAVATE for drains to a firm even bottom with correct gradients in straight runs.

STORMWATER DRAINS: Confirm location of all downpipes and the finished ground levels. Set bends under downpipes in concrete brought up to protect top of fitting from damage. Trowel off and fit C1 grating. Lay drains from high point, in straight runs to correct gradients to discharge into network utility operator stormwater system to their requirements.

CONCRETE ENCASE drains that are shallow or under driveways on 100 mm 17.5 MPa concrete bed reinforced with three 10 mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100 mm 17.5 MPa concrete.

FIELD TESTS: Test drains for watertightness to Section 11, NZS 4452/7643 to satisfaction of Architect and network utility operator inspector.

BACKFILL in 150 mm layers, well pampered but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above finished ground line.

CLEAR away all trade rubbish and remove from site.

R01

ELECTRICAL WORK

R01:01

GENERAL

SCOPE: This section deals with the wiring for power and lighting complete with all componentry and electrical fittings and connected back to the electrical authorities supply.

REFER TO PRELIMINARIES, Section A01 for items affecting this section.

NZ BUILDING CODE: Refer to the following NZ Building Code clauses and Approved Document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the Code.

G9/VM1 Electricity

DOCUMENTS referred to in this section are:

Electricity Regulations 1993

- NZ ECP 2 Electrical installations in damp situations
- NZ ECP 3 Electrical safety of apparatus and materials
- NZ ECP 5 Electrical installations – cold cathode discharge lighting
- NZ ECP 11 Inspecting and testing low-voltage installations for certification
- NZ ECP 28 Selection and installation of cables
- NZ ECP 33 Electrical installations of mineral insulated cable and equipment
- NZS 6401 PVC – insulated cables for electric power and lighting

Documents listed above and cited in the clauses which follow are deemed to form part of this specification. However, this specification takes precedence in the event of it being of a higher standard than the cited documents.

COMPLY with Electricity Regulations 1993 for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

ALL WORK must be carried out by or under the direct supervision of a holder of an employer licence under Electricity Regulations 1993.

CERTIFICATE OF COMPLIANCE: Carry out the prescribed electrical work, test in accordance with ECP 11 and complete a certificate of compliance all as required by Electricity Regulations 1993 and particularly clauses 16, 34 and 35. Allow utility network operator to sight before meter installation, listed work inspection, polarity check and livening of supply. Supply the certificate to the employer.

R01:02

MATERIALS

MAINS UNDERGROUND: Tough plastic sheathed neutral screened cable to NZS 6401 with a minimum rating of 60 amps per phase.

CABLES: Tough plastic sheathed copper conductors to NZS 6401.

- Lighting Circuits 1.0 mm – domestic
- 1.5 mm – commercial
- Power Circuits 2.5 mm

METER BOX: Rust protected metal case and glass panel door all powder coated and complete with meter mounting, main switch and fuse.

DISTRIBUTION BOARD: Rust protected metal case and door all powder coated and complete with neutral and earth busbars, MCB's and 60 amp switch complete with removable insulated panel.

WALL BOXES: Standard size in plastic and 2 or more gang size in metal.

SWITCH UNITS: 10 amp/240V flush polycarbonate units complete. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and two-way units refer to electrical plan.

SWITCHED SOCKET UNITS: 10 amp/240V flush polycarbonate 3 pin combined switch units complete. For number of single and double socket units and in-built earth leakage socket units refer to electrical plan.

CEILING ROSES: White plastic mounting base with screwed cover complete.

BATTEN HOLDERS: Standard white plastic with angled cap complete.

SECURITY LIGHTING: External light fitting and sensor adjustable for angle, range and "on" time.

R01:05

WORKMANSHIP

LAY underground mains to utility network operator's requirements. Allow for trench excavation and backfill.

METER BOX: Fit to maker's instructions, level and plumb where shown on plan, recessed into external wall.

DISTRIBUTION BOARD: Fit to maker's instructions, level and plumb where shown on plan, recessed into wall.

CABLING: Design circuits with a maximum of 10 light outlet units or four switched socket units. All cabling to be run completely concealed.

UNITS: Fit all switch units and socket units level and plumb where shown on plan and to following heights, (centre of unit):

Switch units:	1300 mm
Socket units:	1300 mm over work benches
	400 mm elsewhere
Other units:	as directed on site.