

newvision
architecture

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**SPECIFICATION
& APPENDIX
DOCUMENTS**

PROJECT

**PROPOSED KROMHOUT
ADDITION**

CLIENT

COLIN & RIKKI KROMHOUT

LOCATION

**208 NORTH STREET,
TE AWAMUTU
LOT 3
DPS 25567**

Approved Waipa District Council
Building Department

09 83 / 17

Subject to conditions of
Building Consent No

TABLE OF CONTENTS

1220 PROJECT	3
1232 INTERPRETATION & DEFINITIONS	5
1233 REFERENCED DOCUMENTS	7
1234 DOCUMENTATION	8
1270 CONSTRUCTION	12
2110 DEMOLITION WORKS	17
2210 PREPARATION & GROUNDWORK	20
2310 FOUNDATIONS	22
3101 CONCRETE WORK - BASIC	24
3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES	28
3820 CARPENTRY	33
4161M TEKTON WEATHERIZATION SYSTEM	36
4221TH TMSPEC CERTCLAD HORIZONTAL WEATHERBOARDS	40
4323MT METROTILE METAL ROOFING TILES	45
4521 ALUMINIUM WINDOWS AND DOORS	50
4610 GLAZING RESIDENTIAL	57
4710P PINK® BATTS® & PINK® BATTS® SILENCER® INSULATION	60
4711E EXPOL UNDERFLOOR INSULATION	64
5113G GIB® PLASTERBOARD LININGS	67
6211 WALL TILING	72
6221 FLOOR TILING	77
6700D DULUX PAINTING GENERAL	83
6711D DULUX PAINTING EXTERIOR	89
6721D DULUX PAINTING INTERIOR	90
7120 HOT & COLD WATER SYSTEM	92
7430 DRAINAGE	96
7701 ELECTRICAL BASIC	99

APPENDIX 1 – Truss plan and producer statement
APPENDIX 2 – Lumberlok Fixing Manual
APPENDIX 3 – Flexiseal installation details
APPENDIX 4 – Bracing calculations
APPENDIX 5 – H1 calculations
APPENDIX 6 – Gib Plaster Board Bracing Manual

1220 PROJECT

1. GENERAL

This general section describes the project including:

- A description of the work
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

- 1.1 READ ALL SECTIONS TOGETHER
Read all general sections together with all other sections.

Description of the work

- 1.2 SCOPE OF THE WORK
New dwelling with attached garage

- 1.3 RESTRICTED BUILDING WORK
This project includes Restricted Building Work.

Site

- 1.4 SITE
The site consists of: Existing dwelling, flat site
as shown on drawing no. 02

- 1.5 LEGAL DESCRIPTION
The site of the works, the street address and the legal description are shown on the drawings.

- 1.6 SITE FEATURES

Site environment - Wind

- 1.7 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN
The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone Medium (refer to NZS 3604, table 5.4)

Site environment - Durability

- 1.8 EXPOSURE ZONE
The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: B

Site environment - Seismic

- 1.9 EARTHQUAKE ZONE - NON SPECIFIC DESIGN
The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone is: Zone 1

Archaeological discovery

- 1.10 ANTIQUITIES AND ITEMS OF VALUE
Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site

may be classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.

1232 INTERPRETATION & DEFINITIONS

1. GENERAL

This general section relates to definitions and interpretation that are used in this specification.

Definitions

1.1 DEFINITIONS

Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Review:	Review by the contract administrator is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under <u>Health and Safety at Work Act 2015</u>).

1.2 PERSONNEL

Owner:	The person defined as "owner" in the New Zealand Building Code.
Principal:	The person defined as "principal" in the conditions of contract.
Contractor:	The person contracted by the principal to carry out the contract.
Contract administrator:	The person appointed by the principal to administer the contract on the principal's behalf. Where no person has been appointed by the Principal, it means the Principal or the Principal's representative.

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
PCBU	Person Conducting a Business or Undertaking (under <u>Health and Safety at Work Act 2015</u>)

OSH	Occupational Safety and Health
TA	Territorial Authority
TNZ	Transit New Zealand(Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design

1.4 **DEFINED WORDS**

Words defined in the conditions of contract, New Zealand Standards, or other reference documents, to have the same interpretation and meaning when used in their lower case, title case or upper case form in the specification text.

1.5 **WORDS IMPORTING PLURAL AND SINGULAR**

Where the context requires, words importing singular only, also include plural and vice versa.

1233 REFERENCED DOCUMENTS

1. GENERAL

1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various New Zealand Building Code Compliance Documents (NZBC __), acceptable solutions (__ AS__) and verification methods (__ VM__) for criteria and/or methods used to establish compliance with the New Zealand Building Code.

Reference is also made to various standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), overseas standards and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

It is the responsibility of the contractor to be familiar with the materials and expert in the techniques quoted in these publications.

Documents cited both directly and within other cited publications are deemed to form part of this specification. However, this specification takes precedence in the event of it being at variance with the cited documents.

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

<u>NZBC F4/AS1</u>	Safety from falling
<u>NZBC F5/AS1</u>	Construction and demolition hazards
<u>AS/NZS 1170.2</u>	Structural design actions - Wind loads
<u>AS/NZS 3012</u>	Electrical installations - Construction and demolition sites
<u>NZS 1170.5</u>	Structural design actions - Earthquake actions - New Zealand
<u>NZS 3109</u>	Concrete construction
<u>NZS 3114</u>	Specification for concrete surface finishes
<u>NZS 3404:1997</u>	Steel structures standard
<u>NZS 3602</u>	Timber and wood-based products for use in building
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 4210</u>	Masonry construction: Materials and workmanship
<u>NZS 6803</u>	Acoustics - Construction Noise
<u>Building Act 2004</u>	
<u>Building Regulations 1992</u>	
<u>Health and Safety at Work Act 2015</u>	
<u>Health and Safety at Work (General Risk and Workplace Management) Regulations 2016</u>	
<u>Health and Safety in Employment Regulations 1995 (reprint 4 April 2016)</u>	
<u>New Zealand Building Code</u>	
<u>Heritage New Zealand Pouhere Taonga Act 2014</u>	
<u>Resource Management Act 1991</u>	
<u>Smoke-free Environments Act 1990</u>	
<u>WorkSafe NZ</u>	<u>Guidelines for the provision of facilities and general safety in the construction industry</u>
<u>WorkSafe NZ</u>	<u>Good Practice Guidelines - Excavation Safety</u>
<u>WorkSafe NZ</u>	<u>Scaffolding in New Zealand - Good Practice Guidelines</u>
<u>SARNZ</u>	<u>Best practice guideline for scaffolding in New Zealand</u>

1234 DOCUMENTATION

1. GENERAL

This general section relates to documentation required by the Territorial Authority/Building Consent Authority for compliance with the New Zealand Building Code. It also includes documentation relating to:

- Substitutions
- Manufacturers documents

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the building consent forms and documents from the owner and keep them on site. Liaise with the BCA for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction and then if required to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the contract administrator for direction.

1.3 PROJECT PERSONNEL

Provide names and contact details of the contractor's key personnel and tradespersons who are involved with the project. Review the list once a month and reissue it if changes have been made.

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information. Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LPB previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground construction
- Bricklaying and block laying 1 Brick / masonry veneer
- Roofing 3 Metal tile roofer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered electrician

1.5 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the Contract Administrator. Provide producer statements in the form required by the BCA.

1.6 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

Compliance information

1.7 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

Information may be required either as a condition of the contract documents or as a condition of the building consent. It may include the following:

- Applicators approval certificate from the manufacturer / supplier
- Manufacturer's / supplier's warranty
- Installer / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the BCA.

1.8 DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

1.9 NO SUBSTITUTIONS

Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

1.10 PROPOSED SUBSTITUTIONS

A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the contractor where the contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

1.11 NOTIFICATION OF SUBSTITUTIONS

Notify proposed substitution of specified products. Notification to include but not be limited to:

- Product identification
- Manufacturer's name, address, telephone number, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of NZBC compliance including durability
- Details of manufacturer warranties

Plus an assessment of:

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Any effect the substitution may have on Health & Safety requirements
- Allowance for time and cost for re-design and documentation (if applicable)

- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested:

- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

1.12 ACCEPTANCE OF SUBSTITUTIONS

The Contract administrator must advise of acceptance of substitutions in writing.

Variations to issued Building Consent

1.13 CONTRACTOR VARIATION TO BUILDING CONSENT

Where the contractor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:

- Obtain approval for substitutions from the contract administrator.
- Prepare and provide to the BCA all documentation required for the variation.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.14 PRINCIPALS VARIATION TO BUILDING CONSENT

Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:

- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

Manufacturer's documents

1.15 BRANDED WORK SECTIONS

Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

1.16 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

Manufacturers and supplier's requirements, instructions, specifications or details means those issued by them for their particular material, product or component and are the latest edition.

Branded work sections

1.17 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

Documentation including manufacturer's installation instructions, specification data sheets, producer statements, BRANZ and similar appraisals may be included in the issued Building Consent. These documents have been provided only to demonstrate compliance with the NZBC.

1.18 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

Where manufacturer's installation, application and execution requirements are referred to in this specification, the Contractor must ensure they are fully aware of this

documentation. Whenever necessary obtain and keep on site the relevant latest version of such documentation and make it available to workers carrying out that part of the work.

1.19

CROSS REFERENCED WORK SECTIONS

If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the contract administrator if there is any doubt.

1270 CONSTRUCTION

1. GENERAL

This GENERAL section relates to common requirements for construction issues including: -

- Quality assurance
- Noise and nuisance
- Set out
- Common execution requirements
- Common materials requirements
- Supply of spare materials
- Common requirements for samples and tests
- Final presentation and cleaning
- Commissioning

Quality control and assurance

1.1 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy, including:

- Concrete quality and finish.
- Dimensional accuracy of structural column locations (following completion of foundations).
- All perimeter columns and frames for plumb.
- Levels of all floors relative to the site datum.
- Framing timber moisture content.

Where any material, quality or dimension falls outside specified or required tolerances, obtain written direction from the contract administrator. Where building consent approval is affected, confirm remedial action with the Building Consent Authority.

Provide all materials, plant, attendances, supervision, inspections and programming to ensure the required quality standards are met by all project personnel.

Noise and nuisance

1.2 LIMIT CONSTRUCTION NOISE

Minimise the effects of noise generation by including in the planning of the work such factors as placing of plant, programming the sequence of operations and other management functions. Limit construction noise to comply with the requirements of NZS 6803, the requirements of the Resource Management Act sections 326, 327 and 328 and the Health and Safety in Employment Regulations clause 11.

1.3 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and NZS 6803, tables 3 for the upper limits of construction work noise in residential and industrial areas over the various time periods, particularly 0730 to 1800 hours. Note also the allowed adjustments and exemptions in NZS 6803, 6. Do not exceed these limits.

1.4 PROVIDE INFORMATION TO NEIGHBOURS

Provide information to neighbours of any noise generation from the site liable to constitute a problem. Explain to them the means being used to minimise excessive noise and establish with them the timings most suitable for the noise generating work to be carried on.

Discuss with any complainant the measures being used to minimise noise. Where possible modify these measures to accommodate particular circumstances. Finally, determine the sound level at the location under discussion using methods and observation reporting as laid down in NZS 6803. If the noise level is above the upper limits of NZS 6803, tables 2 and NZS 6803, tables 3, cease the noise generating operation and remedy the problem.

1.5 INCONVENIENCE TO OTHERS

When the works are to be carried out in or around occupied premises, ascertain the nature and times of occupation and use. Carry out the works in a manner to minimise inconvenience, nuisance and danger to occupants and users.

1.6 DIRT AND DROPPINGS

Remove dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site to the satisfaction of the appropriate authorities and the contract administrator.

1.7 DAMAGE AND NUISANCE

Take all precautions to prevent damage and nuisance from water, fire, smoke, dust, rubbish and all other causes resulting from the construction works.

Set-out and tolerances**1.8 SURVEY INFORMATION**

Locate and verify survey marks and datum points required to set out the works. Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.9 SET-OUT AND DATUM

Set out the work to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

1.10 SET-OUT BY LICENSED CADASTRAL SURVEYOR

Before commencing construction provide the contract administrator with a certificate prepared by a licensed cadastral surveyor that the set-out is complete and that the building is accurately placed on the site.

During construction provide the contract administrator with a certificate, prepared by the same licensed cadastral surveyor confirming the set-out of the foundations and grid lines. Necessary adjustments are to be determined and agreed to by the contract administrator before proceeding further.

1.11 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Provide a certificate prepared by a licensed cadastral surveyor that the building has been constructed within the allowed height in relation to boundary. Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator

1.12 USE OF SET-OUT INSTRUMENTS

Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.13 CHECK DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place. Take all dimensions on drawings to be between structural elements before linings or finishes, unless clearly stated otherwise.

1.14 TOLERANCES

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

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances

Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances
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Refer to work sections for tolerance requirements for finishes.

Execution

1.15 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the contract administrator defects that may affect the quality of the proposed work and obtain instructions. Commencing work on any part means that previous work is accepted as being satisfactory for work of the required standard.

1.16 WORKER QUALIFICATIONS

All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

1.17 MINIMISE DELAYS DUE TO WEATHER

Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Materials

1.18 NEW PRODUCTS AND MATERIALS

Materials and products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.19 COMPATIBILITY OF MATERIALS AND FINISHES

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

1.20 STORING PRODUCTS AND MATERIALS

Take delivery of and store products, materials and components in accordance with codes of practice and the product manufacturer's or supplier's stated requirements. Maintain the proper condition of any protective packaging, wrappings or supports during delivery, unloading and storage.

1.21 HANDLING PRODUCTS AND MATERIALS

Handle products, materials and components in accordance with codes of practice and the manufacturer's or supplier's stated guidelines. Avoid distortion and any contact with potentially damaging surfaces or conditions.

1.22 SUBSTRATE CONDITIONS

Ensure substrate conditions are within the manufacturer's or supplier's stated guidelines both before and during the installation of any material, product or system. Obtain written instructions on the necessary action to rectify unsatisfactory conditions.

1.23 INSTALLING PRODUCTS AND MATERIALS

Install in accordance with the manufacturer's or supplier's technical literature. Ensure that all installers are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques.

1.24 COMPLY WITH STANDARDS

Comply with the relevant and/or cited Standard for any material or component. Obtain certificates of compliance when requested by the contract administrator.

1.25 CONDITION OF MATERIALS AND COMPONENTS

To be in perfect condition when incorporated into the work.

- 1.26 **INCOMPATIBLE MATERIALS AND METALS**
Separate incompatible materials and metals with separation layers, sleeves or gaskets of plastic film, bituminous felt or mastic or paint coatings, installed so that none are visible on exposed surfaces.

Samples and tests

- 1.27 **SAMPLES AND PROTOTYPES**
Where specified in the work sections, submit samples, prepare sample panels, and construct prototypes for review as to appearance, form and conformance with the drawings and specifications. Submit all information required to assist the review process, including technical data, manufacturer's literature, independent appraisals and producer statements.

Timing for the provision and review of samples, sample panels and prototypes to be included in the contract programme. Allow a minimum of 10 working days for each review. Proceed only after instructions to proceed have been issued in writing by the contract administrator.

In situ work may be incorporated in the finished work if so confirmed, otherwise allow to remove completely and replace.

- 1.28 **CONTROL STANDARD**
Obtain the contract administrator's confirmation of material, component and work samples which then become the quality control standard. Remove from the site any rejected samples. Retain confirmed samples with care on site for comparison throughout the contract. Remove from the site when no longer required.

Spares

- 1.29 **SPARES**
Collect, protect and store safely all spare materials required under the contract. Give the contract administrator an inventory of all spares.

Final presentation and cleaning

- 1.30 **REMOVE TEMPORARY PROTECTION**
Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.
- 1.31 **REPLACE DAMAGED MATERIALS**
Replace all materials or component damaged during the works to the standard of and integral with the original.
- 1.32 **COMPLETE ALL SERVICES**
Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.
- 1.33 **CLEANING BY CONTRACTOR**
Clear the contract works of all construction materials, waste, dirt and debris. Clean the contract works including:
- Wipe all surfaces to remove construction dust
 - Clean out service ducts and accessible concealed spaces
 - Clean out all gutters and rainwater heads
 - Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass.
 - Remove adhesive residue left by labels and other temporary protection/markings
 - Clean out the interior of all cabinetry
 - Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
 - Remove rubbish and building material from the area immediately adjacent to the contract works

- 1.34 **CLEANING BY COMMERCIAL CLEANER**
Use a commercial cleaning firm to clean the whole of the interior of the building, including all appliances, equipment, fittings, surfaces and finishes to leave it without any blemish. Cleaning to include:
- Clean and wash down all external surfaces to remove dirt, debris and marking.
 - Clean all interior surfaces including cabinetwork, joinery, sanitary and hardware items.
 - Vacuum or polish all floor finishes.
 - Clean and polish all glass, both sides.

Commissioning

- 1.35 **MOVING PARTS**
Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.
- 1.36 **SECURITY AT COMPLETION**
Remove any temporary lock cylinders and complete final keying prior to handing over keys to the principal on completion of the works. Leave the works secure with all accesses locked. Account for all keys/cards/codes and hand to the principal along with an itemised schedule, retaining a duplicate schedule signed by the principal as a receipt.

2110 DEMOLITION WORKS

1. GENERAL

This section relates to the demolition of existing buildings and structures in whole or in part, to the extent necessary to carry out the new work.

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC F5/AS1 Construction and demolition hazards
NZS 6803 Acoustics - Construction noise
NZDAA Best practice guidelines for demolition in New Zealand
WorkSafe Management and Removal of Asbestos (Approved CoP)
Health and Safety at Work Act 2015
Health and Safety at Work (Asbestos) Regulations 2016

1.2 QUALIFICATION

Carry out demolition only under the supervision of a suitably experienced person and using only experienced operators and drivers. Use only experienced, certified/licensed, construction blasters for explosives demolition.

1.3 NOISE

Refer to NZS 6803, tables 2 and 3 for the allowable upper limits of construction work noise in residential, commercial and industrial areas over the various time periods. Use silenced and noise insulated plant to ensure compliance with these requirements.

1.4 NUISANCE

Take all precautions necessary to minimise nuisance caused by dust, dirt, rubbish and water.

1.5 HEALTH AND SAFETY

Comply with the Health and Safety at Work Act 2015 in general, NZBC F5/AS1 and NZDAA Best practice guidelines for demolition in New Zealand, section 5 Demolition Safety.

1.6 BUILDING CONSENT REQUIREMENTS

Demolition work to be carried out to building consent requirements

1.7 INSPECTIONS

Inspection of the demolition work to take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection. Allow 48 hours advanced notice for the inspections.

Obtain and pay for any required inspections which are additional to the building consent.

1.8 SURVEY

Before commencing work, carry out a thorough survey and examination of all buildings or structures to be demolished in order to ensure the extent, sequence, technique and method of demolition proposed can be safely and efficiently carried out.

Take photographs of the works, adjacent buildings and sites, before commencing work. Provide a set of these photographs as a record of existing condition.

1.9 SERVICES

Before commencing demolition, arrange with all utility network operators to disconnect services and remove fittings and equipment. Pay all fees and charges for this work.

1.10 MATERIAL

Material from the demolition becomes the property of the contractor except where expressly provided otherwise. Remove redundant materials from the site as work proceeds.

- 1.11 **SALVAGE**
Designated items remain the property of the owner.
- 1.12 **BURNING OF MATERIALS**
Burning of materials is not permitted on site.
- 2. **PRODUCTS**
- 2.1 **ELEMENTS FOR SALVAGE OR RE-USE**
Carefully dismantle, remove and store on site where directed. Protect from damage and weather until required.
- 3. **EXECUTION**
- 3.1 **DEMOLITION GENERALLY**
Comply with the requirements of NZDAA Best practice guidelines for demolition in New Zealand. Submit a written demolition plan to the requirements of section 4.7, Demolition plan (method statement).
- 3.2 **PROTECT**
Protect retained parts of existing buildings, the site and site structures, trees and shrubs. Take care in the cutting away and stripping out to reduce the amount of making good.
- 3.3 **SUPPORT**
Support and brace the existing structure during the cutting of new openings or the replacement of structural parts. Prevent debris from overloading any part of the structure. Do not remove supports until the new work is strong enough to support the existing structure. Ensure all work remains structurally stable and sound.
- 3.4 **TEMPORARY SCREENS**
Erect approved screens wherever penetration of weather, dust and dirt needs to be prevented. Adjust screens as work proceeds.
- 3.5 **SITE SAFETY**
Prevent access by unauthorised persons. Illuminate and protect all holes, unsafe buildings and other hazards. Leave site and buildings safe at the close of each day's work.
- 3.6 **FLAMMABLE OR EXPLOSIVE CONDITIONS**
Prevent fire or explosion and arrange to alert the appropriate authority where any danger exists.
- 3.7 **DEMOLISH**
Demolish buildings and structures down to the existing finished ground level. Do not remove support to adjacent properties or buildings.
- 3.8 **DEMOLITION, ASBESTOS**
Where demolition work includes contact with or removal of material containing asbestos, comply with, Health and Safety at Work (Asbestos) Regulations 2016, WorkSafe NZ requirements including WorkSafe Management and Removal of Asbestos (Approved CoP), and NZBC F5/AS1.
- 3.9 **DIG OUT**
Dig out foundations, footings, basements, floor slabs, paths, drains, cesspits and manholes that are part of or service the demolished building. Do not backfill the resulting voids.
- 3.10 **SALVAGE**
Carefully dismantle and store safely all salvage items where directed; for removal, use on the site, or until completion of the works.

3.11 **REINSTATE AND MAKE GOOD**
Reinstate and make good demolition damage to adjoining properties, existing work, services, or property.

3.12 **TAKE AWAY**
Take away from the site all plant and equipment, temporary access works and demolished materials and elements. Leave the site completely clean and tidy.

4. **SELECTIONS**

4.1 **ELEMENTS FOR DEMOLITION AND DISPOSAL**

Element/component	Location
Confirm with building owner	TBC

4.2 **ELEMENTS FOR SALVAGE AND DELIVERY TO OWNER**

Salvage the following elements and deliver to the owner.

Element/component	Location	Delivery requirements
confirm with building owner	TBC	TBC

4.3 **ELEMENTS FOR RE-USE**

Element/component	Location	Location for re-use
Window, doors	TBC	TBC

2210 PREPARATION & GROUNDWORK

1. GENERAL

This section relates to the clearance, excavation and backfilling of the site area in preparation for:

- footings and floor slabs
- backfilling behind basement retaining walls

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZS 3604 Timber-framed buildings
WorkSafe NZ Good Practice Guidelines - Excavation Safety

1.2 SITE SAFETY

Provide adequate support for all excavations. Cover holes and fence off open trenches and banks.

1.3 ARCHAEOLOGICAL DISCOVERY

If fossils, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.

2. PRODUCTS

2.1 EXCAVATED CLEAN FILL

Clean, free of contamination, mineral soil from other formations in the excavation which may be selected and approved as suitable for filling by having grading and moisture content properties that will allow recompaction to 95% of maximum density.

2.2 SAND FILL

Clean sand of such grading in particle size to achieve mechanical compaction to 90% maximum density.

2.3 HARD FILL

Scoria or crushed rock to GAP (General All Passing) 40 grading.

3. EXECUTION

3.1 WASHOUT BAY FOR TRUCK

Provide a designated area for trucks to be washed down to avoid mud and dirt being carried off site.

3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the WorkSafe NZ, Good Practice Guidelines - Excavation Safety.

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained.

3.5 PROTECT EXISTING TREES, PLANTING, OR LANDSCAPE FEATURES

Protect from damage trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained. Ensure existing levels are undisturbed beneath the dripline of retained trees.

- 3.6 **EROSION CONTROL**
Ensure measures are in place to contain silt dislodged as a result of water infiltration and to prevent it being carried off site with stormwater.
- 3.7 **SURFACE PREPARATION**
Comply with NZS 3604, section 3.5, **Site preparation**. Remove all turf, vegetation, trees, topsoil, stumps, uncontrolled fill and rubbish from the area to be built on.
- 3.8 **STOCKPILE TOPSOIL**
Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.
- 3.9 **GENERAL EXCAVATION**
Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.
- 3.10 **ROCK EXCAVATION**
If rock is found at any level above the underside of the structural foundations, or above required base levels for site service trenches, immediately notify the owner. Obtain written instructions from the owner on the proposed approach to rock excavation, or consequent alterations to subgrade construction. Confirm any changes with the territorial authority.
- 3.11 **FOUNDATION EXCAVATION**
Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and free of soft spots, stepped as detailed and clean and free of water.
- 3.12 **INADEQUATE BEARING**
If bearing is not to NZS 3604, 3.1.2 **Foundations** and 3.1.3 **Determination of good ground**, then excavate further and backfill with material as follows. Confirm any changes with the territorial authority.
Below slabs on grade: Hardfill compacted in 150mm layers
Below footings: 10 MPa concrete
Service trenches: Hardfill compacted in 150mm layers

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.
- 3.13 **STANDARD OF COMPACTION**
Place fill in layers of not more than 150mm and compact to achieve 95% of maximum dry density. For granular fill material, the fill shall be compacted to 80% of saturated dry density.
- 3.14 **GRANULAR BASE FOR SLABS**
To conform to NZS 3604, section 7.5.3, **Granular base**. Consolidate with a vibrating roller. Blind the surface with 20mm of coarse sand or sand/cement and roll ready to receive a damp-proof membrane.
- 3.15 **GENERAL BACKFILLING**
Obtain written confirmation from the owner before using any excavated material. Compact approved backfilling in 150mm layers with the last 200mm in clean topsoil, lightly compacted and neatly finished off.
- 3.16 **SURPLUS MATERIAL**
Remove surplus and excavated material from the site.

2310 FOUNDATIONS

1. GENERAL

This section relates to all foundation and piling work, with the exception of in situ concrete work and concrete masonry.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZS 3104</u>	Specification for concrete production
<u>NZS 3109</u>	Concrete construction
<u>NZS 3602</u>	Timber and wood-based products for use in building
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 3605</u>	Timber piles and poles for use in buildings
<u>NZS 3603</u>	Timber structures standard

Performance

1.2 INSPECTIONS

Give notice to Engineer and contract administrator, at least 24 hours prior to foundation inspection being required. At inspection foundation to be clear of obstructions like, backfill, site concrete and reinforcing.

2. PRODUCTS

2.1 SQUARE TIMBER PILES

Corsican pine or radiata pine, treated H5 CCA (preservative code 01 or 02) to NZS 3602, table 1A, and complying with NZS 3605 for cross-section, length, straightness, strength and branding. All to NZS 3604 for footing and type.

2.2 TIMBER SUB-FLOOR FRAMING

Species, grade, moisture content in service and level of treatment as set out in NZS 3602. Grading to NZS 3603 and treated to NZS 3602, table 1C.

2.3 NAILS

Steel, stainless steel and galvanized steel of pattern to NZS 3604, table 6.6 **Nailing schedule for hand-driven and power-driven nails** and section 4 Durability.

2.4 BOLTS AND SCREWS

Steel, stainless steel and galvanized steel to NZS 3604.

2.5 NAIL PLATES

Stainless steel and galvanized steel toothed or nailed steel plates to the plate manufacturer's design for the particular locations shown on the drawings.

2.6 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

2.7 CONCRETE

For piles and footings, 17.5 MPa prescribed mix concrete to NZS 3104, section 3, and cover to reinforcing to NZS 3604, 4.5.1, generally 50mm, against ground 75mm. Provisions for prescribed mix concrete, and NZS 3604, section 6.4.5, Pile footings.

3. EXECUTION

3.1 FOUNDATIONS GENERALLY

Comply with NZS 3109, 3602 and NZS 3604 except as varied by this specification.
Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.2 EXCAVATIONS

Refer to 2210 PREPARATION AND GROUNDWORK.

3.3 INSTALL SQUARE TIMBER PILES

Prepare for, place and secure as detailed on the drawings.

3.4 SUB-FLOOR FRAMING

Frame up off foundation walls and piles, all fabricated, fastened and braced to NZS 3604, section 6, **Foundation and subfloor framing**.

4. SELECTIONS

4.1 PILES

Brand/type: square timber

4.2 TIMBER SUB-FLOOR FRAMING

Member	Size	Centres	Species / grade	Treatment
Timber piles:	125 x 125mm square or 140mm dia. round, minimum		Pinus Radiata	H5 CCA (preservative code 01 or 02)
Sub-floor framing:	As per foundation plan sheet 05			
Jack studs:	na			
Bearers:	As per foundation plan sheet 05			

4.3 NAILS

Material < 600mm from ground: Stainless steel
Material > 600mm from ground: galvanized
Location: as per details

4.4 BOLTS AND SCREWS

Material < 600mm from ground: Stainless steel
Material > 600mm from ground: galvanized
Location: as per detail

4.5 NAIL PLATES

Brand/type: TBC
Material < 600mm from ground: Stainless steel
Material > 600mm from ground: galvanized
Location: as per detail

3101 CONCRETE WORK - BASIC

1. GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

ACRS Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.

ACRS web site - www.steelcertification.com

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B1/AS1</u>	Structure
<u>NZBC B1/VM1</u>	Structure
<u>NZBC E2/AS3</u>	External moisture
<u>AS 1366.3</u>	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
<u>NZS 3101.1</u>	Concrete structures standard
<u>NZS 3104</u>	Specification for concrete production
<u>NZS 3109</u>	Concrete construction
<u>NZS 3114</u>	Specification for concrete surface finishes
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 4229</u>	Concrete masonry buildings not requiring specific engineering design
<u>AS/NZS 4671</u>	Steel reinforcing materials
<u>AS/NZS 4858</u>	Wet area membranes
<u>CCANZ CP 01</u>	Code of practice for weathertight concrete and concrete masonry construction

Requirements

1.3 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to AS/NZS 4671. Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

2. PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

2.2 PRESCRIBED MIX CONCRETE

Prescribed mix concrete 17.5, 20 or 25 MPa grade (refer to SELECTIONS) minimum strength, using either separate batching of sand and builder's mix or coarse aggregate to NZS 3104, table 3.1, Grading recommendations for combined and uncombined coarse aggregates.

- 2.3 **SITE CONCRETE**
Concrete 10 MPa with minimum water for workability, all materials and batching to NZS 3104, table 3.1, Prescribed mixes (P).
- 2.4 **MASS CONCRETE**
Concrete having a minimum strength of 10 MPa at 28 days
- 2.5 **REINFORCEMENT**
Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671, and 500E mesh to AS/NZS 4671 as modified by NZS B1/VM1.
- 2.6 **TYING WIRE**
Mild drawn steel wire not less than 1.2mm diameter.
- 2.7 **SPACERS AND CHAIRS**
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.
- 3. EXECUTION**
- 3.1 **HANDLE AND STORE**
Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.
- Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.
- 3.2 **CUT AND BEND REINFORCEMENT**
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3109, table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.
- 3.3 **ADJUSTMENTS**
Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.
- 3.4 **TOLERANCES, BENDING**
To NZS 3109, 3.9, Tolerances for reinforcement.
- 3.5 **SECURE REINFORCEMENT**
Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums in NZS 3109, 3.6, Spacing of reinforcement.
- 3.6 **LAPPED SPLICES**
Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked. Welded wire mesh laps to NZS 3101, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).
- 3.7 **CASTING IN**
Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.
- Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase

aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.8 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.

3.9 SURFACE FINISHES

To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.10 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.11 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.12 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.13 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.14 CURING OF CONCRETE

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, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.15 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

4. SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.2 NORMAL CONCRETE

Normal concrete:
17.5 MPa:

4.3 PRESCRIBED MIX CONCRETE

Prescribed mix concrete:

10 MPa: Site concrete, bedding concrete and for setting posts
17.5 MPa: As required by NZS 3604

25 MPa: As required by NZS 3604 and for exposed concrete in sea spray zone

3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES

1. GENERAL

This section relates to the manufacture, supply and erection, of prefabricated:

- MiTek® timber roof trusses (GANG-NAIL® roof trusses)
- MiTek® bolted style timber roof trusses - (GANG-NAIL®) XPOTRUSS roof trusses
- MiTek® floor trusses (Posi-STRUT® truss systems)
- MiTek® rafter and purlin trusses (Posi-STRUT® truss systems)

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FTMA	Frame and Truss Manufacturers Association of New Zealand Inc.
SED	Specific Engineering Design

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B1/VM1</u>	Structure
<u>NZBC B2/AS1</u>	Durability
<u>AS/NZS 1170.0</u>	Structural Design Actions - General principles
<u>AS/NZS 1170.2</u>	Structural Design Actions - Wind actions
<u>NZS 1170.5</u>	Structural Design Actions - Earthquake actions - New Zealand
<u>NZS 3602</u>	Timber and wood-based products for use in building
<u>NZS 3603</u>	Timber structures standard
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 3640</u>	Chemical preservation of round and sawn timber
<u>FTMA CoP</u>	Frame and Truss Manufacturers Association Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- MiTek® (GANG-NAIL®) Roof Truss System Manual
 - MiTek® (GANG-NAIL®) Roof Truss Installation manual
 - MiTek® (GANG-NAIL®) XPOTRUSS Roof Truss System brochure
 - MiTek® (GANG-NAIL®) Posi-STRUT® Truss System Manual
 - MiTek® Structural Fixings On-site guide for Building Code Compliance (2012)
- For the latest version of the documents refer to the manufacturer's web site.

Manufacturer/supplier contact details

Company:	MiTek New Zealand Limited
Web:	www.mitek.nz.co.nz
Email:	design@miteknz.co.nz
Telephone:	09 274 7109 or 03 348 8691

Requirements

1.4 QUALIFICATIONS

Fabricators to be experienced competent workers, familiar with the materials and the techniques specified.
Fabrication companies to be MiTek® accredited fabricators.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

- 1.6 **DESIGN CRITERIA NON-SPECIFIC DESIGN**
Individual timber framing members used separately, but in association with the trusses, to NZS 3604.

- 1.7 **DESIGN CRITERIA SED**
Frames and trusses to, Alternative Solution MiTek® 20/20 and MiTek Sapphire® Design Programme, NZBC B1/VM1, AS/NZS 1170.0, AS/NZS 1170.2, NZS 1170.5 and NZS 3603.

Documentation for Building Consent/Code Compliance Certificate

- 1.8 **DOCUMENTATION - FABRICATOR / MANUFACTURER**
To NZS 3604, 10.2.2.3 **Drawings and Specifications** and the provisions/requirements of the following related clauses.

- 1.9 **PROVISION OF STATEMENTS**
Provide the following documentation. The statements shall include the name and position within the company of the person providing the statement.
Fabricator Design and Manufacturing Statements shall be noted as being:
- Issued by a named company, accredited as a fabricator by the nail plate manufacturer
- Issued to the named Owner and available for use by a BCA to assist in determining compliance with the NZBC.

- 1.10 **SHOP DRAWINGS**
Provide drawings showing the trusses and their layout;
- one prior to fabrication (buildable truss layout) for consent purposes.
- one post fabrication As Built (as fabricated layout) for construction and code compliance purposes.

The drawing shall be identified as 'Buildable' or 'As Built' (as fabricated) and shall include the following:

- The name and contact details of the accredited fabricator
- The job/design reference name or number
- The site address/location

Site specific structural and loading information including

- Pitch
- Cladding type
- Wind and snow loading values
- Date drawn
- A truss layout with truss labels and dimensions to locate the trusses on the supporting structure
- Identification of all load bearing walls/beams used to support trusses
- Specification and location of truss to truss and truss to top plate fixings or notification that such items are specified by others
- Identification of the location of any resulting loads where the design of the supporting member will be outside the scope of NZS 3604 (point loaded lintels and point loads on internal walls where the downward and upward loads are higher than 16kN) and where appropriate, any slab thickening required
- Reference to the Fabricator Design Statement

- 1.11 **DESIGN STATEMENT - FABRICATOR**
Provide a Design Statement issued by the fabricator listing the job specific inputs used in the design process.

The Design Statement shall identify:

- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- Software date/version
- Reference to the Producer Statement - Design
- Supporting compliance documents including standards for material grades and sizes
- The job/design reference name or number
- The site address/location

Job specific information:

- Loads allowed for in the specific design including dead loads (cladding and ceiling) and live loads (wind and snow)
- Roof pitch
- Nominal overhang length
- Importance Level

Design working life:

- A list of the designed trusses, spans and maximum spacing
- Date of design

1.12 PRODUCER STATEMENT - DESIGN

Provide a Producer Statement - Design issued by the software provider, supporting the software and the engineering principles being applied by the software.

The Producer Statement shall:

- Have a level of detail consistent with that of an IPENZ Producer Statement PS1
- State the means of compliance with NZBC
- Reference the truss layout and Fabricator Design Statements
- Identify the job/design reference name or number
- Identify the software date/version
- Be signed by a Chartered Professional Engineer

1.13 MANUFACTURING STATEMENT

Provide a statement to support the manufacture of the roof trusses in accordance with the principles of the design statement and truss layouts. This statement is to be issued by a fabricator after manufacture has occurred and identifying:

- The job/design reference name or number
- The site address/location
- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- That the trusses were manufactured in accordance with the Design Statement
- The name and position within the company of the person providing the statement

Truss identification

1.14 IDENTIFICATION OF TRUSSES ON-SITE

A selection of trusses in a job lot manufactured by a fabricator shall carry identification labels or markings fitted during manufacture, to NZS 3604, 10.2.2.5, **Truss identification**.

Identification shall be evident on the bottom chords of main rafter or girder trusses on a minimum of 6 trusses in a job lot, or on every truss where there are less than 6 trusses in the job lot.

Identification text shall be a minimum of 10mm high and shall include:

- The fabricator name
- The nail-plate manufacturer name
- The job/design reference name or number

2. PRODUCTS

Materials

2.1 MITEK TRUSSES - TIMBER

Structural grade timber to NZS 3602, NZBC B2/AS1, gauged, maximum moisture content of 20%, treated to NZS 3640, NZBC B2/AS1, hazard class H1.2 and identified with its unique identifier.

2.2 MITEK ROOF TRUSSES - TOOTHED PLATE

MiTék® (GANG-NAIL®) timber roof trusses with toothed plate connectors. Design and layout to be determined by a MiTek® accredited fabricator, refer SELECTIONS.

Accessories

- 2.3 **STEEL TOOTHED CONNECTOR PLATES**
 GANG-NAIL® 1.0mm to 2.0mm thick steel sheet, Z275 galvanized to NZS 3604, table 4.2, **Galvanizing of steel components other than nails and screws** and punched to form a toothed connector. For (roof) spaces designated closed environments to NZS 3604.
- 2.4 **BOWMAC GALVANIZED STRUCTURAL BRACKETS**
 MiTek® BOWMAC® >3mm thick steel plate brackets, hot-dip galvanized to NZS 3604, table 4.2, **Galvanizing of steel components other than nails and screws** with hot-dip galvanised bolts/screws and washers.
- 2.5 **CORROSION RISKS**
 For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

3. EXECUTION

Conditions

- 3.1 **COMPLY**
 Comply with current standards, code requirements and the FTMA CoP in the design and fabrication of trusses and frames.
- 3.2 **DELIVER, HANDLE AND STORE TRUSSES AND FRAMES**
 Deliver, handle and store frames and trusses so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Follow manufacturer's requirements. Handle all frames and trusses with nylon strops or similar to prevent damage. Store under cover and clear of the ground, to keep dry prior to installation.

Fabrication

- 3.3 **DIMENSIONS, NOT EXPOSED ELEMENTS**
 Each member calculated length $\pm 3\text{mm}$. Width and thickness to gauging tolerances. Each overall joint within $\pm 3\text{mm}$ of correct outside profile (including camber allowance).
- 3.4 **DIMENSIONS, EXPOSED ELEMENTS**
 Each member calculated length $\pm 1\text{mm}$ width and thickness to gauging tolerances. Each overall joint within $\pm 3\text{mm}$ of correct outside profile (including camber allowance). Joint thickness and width difference between members 1mm maximum. Plate location within half of the manufacturer's tolerances plus a rotation of no more than 1mm in 100mm off reference line.
- 3.5 **FABRICATION**
 Factory fabricate to the GANG-NAIL® Manufacturing System. Build camber into all elements to accommodate normal deflection under load. Lay up members accurately with all joints tight fitting. Mechanically press plates to manufacturer's tolerances, fully and flat over their whole area into the members forming the joint.

Site installation

- 3.6 **MITEK (GANG-NAIL) ROOF TRUSS ERECTION**
 To MiTek® (GANG-NAIL®) Roof Truss Installation manual.
 Lift, place and fix trusses without overstressing or deformation. Use temporary supports as needed without causing damage. Fit trusses to wall plates and beams to MiTek®

(GANG-NAIL®) requirements, but no less than NZS 3604, section 10, **Roof framing** and in particular section 10.2.2, **Roof trusses**. Fit and fix bracing as detailed and to NZS 3604: section 10.2.2, **Roof trusses** and section 10.3, **Systems to resist horizontal loads**. Ensure all trusses are correctly located, plumb and true to line and face.

- 3.7 **MITEK (GANG-NAIL) ROOF TRUSS CONNECTION AND FIXING**
To MiTek® (GANG-NAIL®) Roof Truss Installation manual.
Fit connectors and fixings to obtain full bearing over all contact surfaces and ensure the required loading capacity for the truss and frame roof is maintained. Fix each roof framing member in accordance with MiTek® (GANG-NAIL®) requirements and NZS 3604, Section 10, **Roof framing**. Ensure the size, number and location of nails to be used in roof framing comply with requirements of Table 10.8, **Nailing schedule for hand-driven and power-driven nails**, or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.
- 3.8 **ROOF BRACING**
Refer to 3821M MITEK TIMBER FRAMING for roof bracing of trussed roofs.
- 3.9 **DPC TO TIMBER**
Lay DPC between all timber frames and concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. For LOSP treated timber use only a DPC specifically suitable with LOSP treatment.
- 3.10 **TIGHTEN BOLTS**
Check and tighten any related fixing bolts after erection is completed.

Completion

- 3.11 **REPLACE**
Replace or repair damaged elements.
- 3.12 **REMOVE**
Remove debris, unused materials and elements from the site.
- 3.13 **LEAVE**
Leave work to the standard required by following procedures.
4. **SELECTIONS**
For further details on selections go to www.mitek.nz.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

- 4.1 **MITEK (GANG-NAIL) ROOF TRUSSES**
Location: Refer to roof framing plan
Brand/type: **MiTek® (GANG-NAIL®) timber roof trusses**
Species: Radiata pine (gauged)
Moisture content: 20% maximum
Treatment: H1.2
Connector finish: Galvanized
End connectors: Refer to manufactures truss plan
- 4.2 **BOWMAC STRUCTURAL BRACKETS**
Location: Refer to plans
Brand: MiTek® BOWMAC
Code/finish: Galvanized

3820 CARPENTRY

1. GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as partitioning. It includes prefabricated timber and engineered wood.

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B2/AS1</u>	Durability
<u>AS/NZS 1328.1</u>	Glued laminated structural timber - Performance requirements and minimum production requirements
<u>AS/NZS 1604.4</u>	Specification for preservative treatment - Laminated veneer lumber (LVL)
<u>AS/NZS 1604.5</u>	Specification for preservative treatment - Glue laminated timber products
<u>NZS 3602</u>	Timber and wood-based products for use in building
<u>NZS 3603</u>	Timber structures standard
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 3622</u>	Verification of timber properties
<u>NZS 3640</u>	Chemical preservation of round and sawn timber
<u>AS/NZS 4357.0</u>	Structural laminated veneer lumber - Specification
<u>FTMA CoP</u>	Frame and Truss Manufacturers Association Code of Practice
*A copy of <u>NZS 3604 Timber-framed buildings</u>, must be held on site.	

1.3 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 DIMENSIONS

All timber sizes except for battens are actual minimum dried sizes.

2. PRODUCTS

2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to NZS 3602, NZBC B2/AS1 and treatment to NZS 3640, NZBC B2/AS1. Structural grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

2.2 ENGINEERED WOOD

LVL members to AS/NZS 4357.0, to required sizes and lengths and the manufacturer's design properties.

Treatment to NZS 3640 and AS/NZS 1604.4.

2.3 TIMBER TRUSSES

To FTMA CoP. Moisture content 16% at supply.

2.4 NAILS

Type to NZS 3604, section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of NZS 3604, sections 6-10.

2.5 BOLTS AND SCREWS

Bolts and screws of engineering and/or coach type complete with washers, to the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

- 2.6 **NAIL PLATES**
Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.
- 2.7 **CONNECTORS**
Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.
- 2.8 **CORROSION RISKS**
For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).
- 2.9 **DPC**
Refer to 4161 UNDERLAYS, FOIL AND DPC section
3. **EXECUTION**
- 3.1 **EXECUTION GENERALLY**
To NZS 3604 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
- 3.2 **SEPARATION**
Separate all timber framing timbers from concrete, masonry and brick by: -
- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space
- 3.3 **ATTENDANCE**
Provide and fix blocks, nogs, openings and other items as required by other trades.
- 3.4 **MOISTURE CONTENT**
Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.
Framing at erection: 24% maximum
Framing at enclosure: 20% maximum
Framing at lining: 16% maximum
- 3.5 **SET-OUT**
Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings.
- 3.6 **FRAMING WALLS**
Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8, **Walls**.
- 3.7 **FRAMING ROOFS**
Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.
- 3.8 **FRAMING CEILINGS**
Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**.
Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in**

ceilings. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space.**

3.9 INSTALLING WALL UNDERLAYS
Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.10 DPC TO LOSP TREATED TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.11 DPC TO TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4. SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
Parapets:	Radiata pine	SG8	H1.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Radiata pine	SG8	H3.2
Wall battens (not cavity):	Radiata pine	Merch	H1.2
Jamb battens:	Radiata Pine	Merch	H3.1

4.2 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.3 INTERIOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2

4161M TEKTON WEATHERIZATION SYSTEM

1. GENERAL

This section relates to the application of **Marshall Innovations Limited Tekton® Weatherization System** which consists of:

- **Tekton® Building Wrap** (also called **Tekton HouseWrap**)
- **Tekton® Seam Tape**
- **SUPER-STICK Building Tape®**
- **TRADE-SEAL** (penetration seal)

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following definitions apply specifically to this section:

Wall underlay the same meaning as defined in **NZBC E2/AS1**, covering kraft based and synthetic wall underlays, sometimes called, wall wraps, building wraps or building papers.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1 Durability
NZBC E2/AS1 External moisture

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Specification for **Tekton® Weatherization System**
 Specification for **Tekton® Building Wrap**
 Brochure for **Tekton® HouseWrap**
 Specification for **SUPER-STICK Building Tape®**
 Brochure for **SUPER-STICK Building Tape®** Specification for **TRADE-SEAL**
 Brochure for **TRADE-SEAL**
BRANZ Appraisal 621 - The Tekton® Weatherization System
BRANZ Appraisal 548 - Tekton® Building Wrap
BRANZ Appraisal 846 - SUPER-STICK Flexible Flashing Tape
BRANZ Appraisal 719 - Trade-Seal Pipe and Penetration Seal

Manufacturer/supplier contact details

Company: **Marshall Innovations Limited**
 Web: www.mwnz.com
 Email: headoffice@mwnz.com
 Telephone: 0800 776 9727

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For **Tekton® Building Wrap**
 15 years: For **Tekton® Seam Tape**
 15 years: For **SUPER-STICK Building Tape®**
 15 years: For **TRADE-SEAL**

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

- 1.5 **QUALIFICATIONS**
Work to be carried out by tradespeople experienced, competent and familiar with the **Marshall Innovations Limited** materials and techniques specified.

- 1.6 **NO SUBSTITUTIONS**
Substitutions are not permitted to any of the specified **Marshall Innovations Limited** systems, components and associated products listed in this section.

2. **PRODUCTS**

Materials

- 2.1 **TEKTON BUILDING WRAP**
Tekton® Building Wrap, a synthetic breather-type wall underlay, as a coated spun-bonded polypropylene product approximately 0.6mm thick. Supplied in rolls 2740mm x 37m and 1370mm x 37m.

- 2.2 **TEKTON SEAM TAPE**
Tekton® Seam Tape, a white polypropylene film coated with a cold weather acrylic adhesive.

- 2.3 **TRADE-SEAL**
TRADE-SEAL, a one piece self adhesive EPDM collar for pipes and conduits that penetrate the cladding/wrap/underlay. Provides secondary protection air and moisture seal, and is available in sizes to suit penetration diameters from 8mm to 220mm.

Accessories

- 2.4 **FIXINGS**
Staples, clouts or other temporary fixings to attach the wall underlay to the framing.
- 2.5 **BUILDING WRAP/WALL UNDERLAY RESTRAINTS**
Polypropylene tape or galvanized wire or mesh, to NZBC E2/AS1, clause 9.1.8.5, **Wall framing behind cavities**, for intermediate restraining of the building wrap/wall underlay from bulging into the drained cavity where stud spacings are greater than 450mm. Wire or tape to be run horizontally at 300mm centres.

3. **EXECUTION**

Conditions

- 3.1 **GENERAL REQUIREMENTS**
To NZBC E2/AS1 Table 23 Properties of Roof Underlays and Wall Underlays; and manufacturers technical literature.
Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

- 3.2 **STORAGE**
Store all products under clean dry conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture. Rolls of **Tekton® Building Wrap** to be stored on end.

- 3.3 **PRE-INSTALLATION REQUIREMENTS**
Before starting work, check that the framing will allow work of the required standard. The framing must be free from any sharp protrusions that may damage the wrap/underlay. Carry out remedial work identified before the installation of **Tekton® Weatherization System**.

Installation - generally

- 3.4 **STANDARDS AND TOLERANCES**
To NZBC B2/AS1 and NZBC E2/AS1. Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - Tekton® Building Wrap

- 3.5 **WRAP/UNDERLAY GENERALLY**
To comply with Marshall Innovations Limited specification for **Tekton® Weatherization System**, BRANZ Appraisal 621 - The **Tekton® Weatherization System** and BRANZ Appraisal 548 - Tekton® Building Wrap.
- Face branded side of the wrap/underlay away from the framing. Run horizontally and extend from upper side of the top plate to the underside of bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.
- Ensure horizontal laps no less than 75mm with the direction of the lap ensuring that water is shed to the outside. End laps to be made over framing and be no less than 150mm wide.
- 3.6 **FIXINGS**
Fix the wrap/underlay into place using 6mm to 8mm zinc plated staples, hot dip galvanised large head clouts, tek screws or proprietary wrap/underlay fixings. Care to be taken when fixing in windy conditions, due to large sail area created by roll widths.
- 3.7 **POSITION ROLL**
Position roll against the framing with a short length of wrap/underlay free of the roll. Align the guide marks printed on the **Tekton® Building Wrap** with visible studs and nail/staple to the framing.
- 3.8 **FIX TO FRAMING**
Unroll wrap/underlay across framing and fix to all framing members at a maximum of 300mm centres. Keep straight and taught over framing. Unroll wrap/underlay across framing and fix to all framing members at a maximum of 300mm centres. Keep straight and taut over framing.
- 3.9 **WRAP/UNDERLAY OVER OPENINGS**
Run wrap/underlay over any openings and leave covered until windows and doors are ready to be installed.
- 3.10 **FORM OPENINGS**
Form openings by cutting wrap/underlay at a 45 degree diagonal in from each corner. Fold and staple wrap/underlay to the inside of the framed opening.
- 3.11 **APPLY SEAM TAPE**
Apply **Tekton® Seam Tape** to all horizontal and vertical building wrap/underlay joints. Lap joint to sit halfway under the tape width. Press all tape firmly into position to enhance adhesion. Use **Tekton® Seam Tape** to repair small rips, punctures or tears in the building wrap/underlay and tape into place. Ensure overlapping material extends at least 150mm beyond the damaged area.
- 3.12 **INSTALL PENETRATION SEAL**
For pipe and conduit penetrations of the cladding/wrap/underlay use the appropriate sized **TRADE-SEAL**, to ensure a tight fit around the pipe. Any paired cable or multiple air conditioning pipes must pass through a conduit. Conduits must be sealed to prevent entry of any wind driven moisture. Conduits can be sealed with either an expanding foam or sealant. Install the **TRADE-SEAL** to Marshall Innovations Limited requirements. Push back the collar to fit the cavity width. Ensure the **TRADE-SEAL** exposure to weather and UV does not exceed 90 days. Trade-Seals should never be forced over pipes or conduit, they can be trimmed to get appropriate fit.

Completion

3.13 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.

3.14 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

4. SELECTIONS

4221TH TIMSPEC CERTCLAD HORIZONTAL WEATHERBOARDS

1. GENERAL

This section relates to the supply and fixing of **Timber Specialists Ltd (Timspec) CertClad**, horizontal, timber weatherboard cladding systems over drained cavity it includes:

- Bevel back weatherboards
- Rusticated weatherboards
- Timber species; Accoya, Radiata Pine, or Canadian Western Red Cedar
- Weatherboard trim
- Cavity batten systems
- Fixings
- Flashings
- Pre-finishing

1.1 RELATED WORK

Refer to timber framing section for wall framing and cavity battens.
Refer to painting sections for on-site finishes to weatherboard cladding.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification Schemes

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B2/AS1</u>	Durability
<u>NZBC E2/AS1</u>	External moisture
<u>NZS 3602</u>	Timber and wood-based products for use in building
<u>NZS 3604</u>	Timber-framed buildings
<u>BRANZ BU 582</u>	Structurally fix cavity battens
<u>CodeMark CMA-CM40053(Rev1)</u> - Timspec CertClad Weatherboards Rusticated Cavity System	
<u>CodeMark CMA-CM40010(Rev2)</u> - Timspec CertClad Bevel Back Weatherboards	

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Timspec CertClad documents relating to this part of the work:
Timspec CertClad Weatherboards Bevel Back Cavity System Installation Manual - Version 2.1
Timspec CertClad Weatherboards Rusticated Cavity System Installation Manual - Version 2.1
FSC and PEFC Forestry Sustainable Certification - contact Timspec CertClad

Manufacturer/supplier contact details

Company:	Timber Specialists Ltd (Timspec)
Contacts:	Auckland - Chris Wiffen or Jonathan Rugg (09 620 0260) Christchurch - Gareth Goodman Jones or Stephen Norris (03 341 0242)

Web:	www.certclad.co.nz (www.timspec.co.nz)
Email:	sales@timspec.co.nz
Telephone	09 620 0260 Auckland 03 341 0242 Christchurch

Requirements

- 1.5 **QUALIFICATIONS**
Installers to be experienced, competent trades people familiar with the materials and techniques specified.
- 1.6 **NO SUBSTITUTIONS**
Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.
- 1.7 **COMPLIANCE - BEVEL BACK WEATHERBOARDS**
To meet the requirements of the CodeMark certificate CodeMark CMA-CM40010(Rev2):-
- Risk Score to E2/AS1 no greater than 20
- Wind zone to NZS 3604 no greater than Very High (without special provisions).
- Installation to; Timspec CertClad Weatherboards Bevel Back Cavity System Installation Manual - Version 2.1

Performance

- 1.8 **PERFORMANCE**
Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To NZBC B2/AS1 Durability and NZBC E2/AS1 External moisture.

Performance - Wind (design by contractor)

- 1.9 **DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR**
Design the installation to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

2. PRODUCTS

Materials

- 2.1 **TIMBER SPECIES - RADIATA PINE**
Timspec CertClad Radiata pine, grading to NZS 3602, NZS 3631, treatment H3.1 or H3.2 to NZS 3602, table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in long lengths, with all knots excluded.

Timspec CertClad Radiata pine is supplied from New Zealand forest sources, a mixture of FSC certified and non-contentious resources.
Refer to Timspec CertClad details.
- 2.2 **WEATHERBOARD PROFILE - BEVEL BACK**
Timspec CertClad profiles P61 or P62 in Accoya, Radiata pine or Western Red Cedar. Weatherboards in lengths relevant to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position. Refer to SELECTIONS.
- 2.3 **COVER BOARDS, MOULDINGS AND SCRIBERS**
To Timspec CertClad profiles as detailed, with species and grading to NZS 3602, but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.
- 2.4 **WALL UNDERLAYS**
For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

Components

- 2.5 **NAILS, GALVANIZED**
Timspec Jolt Head, Annular Grooved Shank galvanized fixings to NZBC E2/AS1 Table 24. Refer to **Timspec CertClad** construction details for fixing details and to **SELECTIONS** for fixing sizes. All galvanized nails must be punched, filled and painted. Do not use galvanised nails for Accoya, Western Red Cedar, or with pine treated with micro copper (Azoles, ACQ, CuAZetc), Notify contract administrator.
- 2.6 **FLASHINGS**
To NZBC E2/AS1, 4.0 **Flashings**. Material, grade and colour as detailed and scheduled and to NZBC E2/AS1; Table 21: **Compatibility of materials in contact** and Table 22: **Compatibility of materials subject to run-off**. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.
- 2.7 **SOAKERS, STAINLESS STEEL / GALVANIZED / ALUMINIUM**
To NZBC E2/AS1, 4.0 **Flashings**. Machine folded stainless steel/zinc coated steel sheet to profile of weatherboard and mitred corner joints. To NZBC E2/AS1; Table 21: **Compatibility of materials in contact** and Table 22: **Compatibility of materials subject to run-off**. Ensure that materials used for soakers are compatible with adjacent materials and fixings, cladding materials and fixings.
- 2.8 **SOAKERS, COPPER**
To NZBC E2/AS1, 4.0 **Flashings**. Machine folded half-hard copper sheet to profile of weatherboard and mitred corner joints. To NZBC E2/AS1; Table 21: **Compatibility of materials in contact** and table 22: **Compatibility of materials subject to run-off**. Ensure that materials used for Soakers are compatible with adjacent materials and fixings and cladding materials and fixings.

Finishes

- 2.9 **FACTORY PRE-FINISHING - OIL BASED PRIMER**
Factory spray application of selected solvent based oil primer coat (only) on to timber surface.

Refer to **SELECTIONS** for brand and type.

Further site applications to manufacturers specifications. Refer to painting sections.

3. EXECUTION

Conditions

- 3.1 **GENERALLY**
Execution to Timspec CertClad CodeMark, NZBC E2/AS1: 3.0 **Weathertightness risk factors**, and 9.0 **Wall claddings**, 9.1.8 **Drained cavities** and 9.4 **Timber weatherboards**.
- 3.2 **STORAGE**
Take delivery of Timspec CertClad timber products, dry, unmarked and undamaged from freight and handling (Grade characteristics excluded). Store on site to Timspec requirements, laid flat and true under cover.
- 3.3 **SUBSTRATE**
Before starting fixing ensure that the substrate conforms with NZS 3604, section 2, table 2.1, **Timber framing tolerances** and the requirements of NZS 3604, section 6, **Foundation and subfloor framing** and NZBC E2/AS1, governing support for timber board cladding. Ensure wall studs are a maximum of 600mm centres.

Application - cavity battens

Application - fixing

- 3.4 FIXING - PAINT FINISH**
Install level, true to line and face, to NZBC E2/AS1: 9.4 Timber weatherboards. Prime all cut ends before fixing. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Punch all fixings and prime all raw, exposed timber surfaces. Using an appropriate filler, fill all nail holes flush with board surface.

- 3.5 FIXING BEVEL BACK WEATHERBOARDS**
Installation to CodeMark certificate CodeMark CMA-CM40010(Rev2) and Timspec CertClad Weatherboards Bevel Back Cavity System Installation Manual - Version 2.1.

Install level, true to line and face, to NZBC E2/AS1: 9.4 Timber weatherboards. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Nail weatherboards to every fixing point with one nail, just clear of the lapped board below, 35mm from bottom of board. Nails to be hand-driven in with a slightly upward slope. Refer to Timspec CertClad Nail fixing.
Butt end or scarf joints, mitre external corners and scribe internal corners. Orientate scarf joints to face away from prevailing winds and weather. Back flash internal corners. Fit soakers to Butt end joints, scarf joints and external corners. Random stagger Butt end joints/Scarf joints across adjacent boards.
Refer to Timspec CertClad Installation Manual for external and internal Corner construction details.

- 3.6 INSTALL FLASHINGS**
Install flashings, covers and soakers as detailed on the drawings or Installation Manual and to NZBC E2/AS1.

- 3.7 COMPLETE**
Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

Completion

- 3.8 ROUTINE CLEANING**
Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused and temporary materials and elements from the site.

- 3.9 DEFECTIVE OR DAMAGED WORK**
Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

- 4. SELECTIONS**
For further details on selections go to www.certclad.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Weatherboards and trim

- 4.1 TIMSPEC CERTCLAD - WEATHERBOARDS - BEVEL BACK**
- | | |
|-------------------|------------------------------------|
| Location: | As per elevations |
| Species: | Timspec CertClad radiata pine |
| Grade: | Radiata pine |
| Treatment: | H3.1 |
| Profile: | to match existing house |
| Cover dimensions: | TBC |
| Thickness: | TBC |
| Moisture content: | 14 - 18% at fixing |
| Pre-finish: | Primed only (refer finishes below) |

- 4.2 TIMSPEC CERTCLAD - COVER BOARDS, BOXED CORNERS AND SCRIBERS**
- | | |
|-----------|-------------------------------|
| Location: | External corners |
| Species: | Timspec CertClad Radiata pine |
| Grade: | Timspec CertClad TBC |

Cover boards: TBC
Scriber: TBC
Pre-finish: TBC
Moisture content: 14 - 18% at fixing

- 4.3 **FIXINGS - BEVEL BACK**
Nails: Refer to timspec construction details
Size: Refer to timspec construction details

Flashings and accessories

Finishes - factory applied

- 4.4 **FACTORY PRE-FINISH COAT - OIL BASED PRIMER**
Brand/ type: DULUX Ultra Prime
Coating process: Spray Application
Colour: TIMSPEC Biege
Factory coats: One
On-Site manual coats: Refer to painting section/s

4323MT METROTILE METAL ROOFING TILES

1. GENERAL

This section relates to **Metrotile (NZ) Ltd** interlocking pressed metal roofing tiles complete with underlay, battens and accessories.
It includes seven Metrotile profiles composed of a Zinalume protected steel substrate covered with;
- a natural stone granular finish (textured finish)
- an acrylic satin finish

1.1 RELATED WORK

Refer to 7411 RAINWATER SPOUTING SYSTEMS for rainwater disposal.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

NZMRM New Zealand Metal Roofing Manufacturers Inc.

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC E2/AS1</u>	External moisture
<u>NZBC G12/AS1</u>	Water supplies
<u>AS/NZS 1170.2</u>	Structural design actions, Wind actions
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 4217</u>	Pressed metal tile roofs
<u>NZMRM CoP</u>	NZ Metal Roof and Wall Cladding Code of practice (CoP)

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Metrotile Company Brochure
Metrotile Roofing Systems Installation Manual; Bond/Classic/Roman/Shake
Technical Specification for Bond Tile
Technical Specification for Classic Tile
Technical Specification for Shake Tile
Technical Specification for Roman Tile
Technical Specification for Shingle Tile
Technical Specification for Royal Tile
Technical Specification for Tudor Tile

Manufacturer/supplier contact details
Company: **Metrotile (NZ) Ltd**
Web: www.metrotile.com
Email: info@metrotile.com
Telephone: 09 2999498

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
50 years (25+25): For Metrotile Zinalume roofing tiles (paint or chip): manufactures 25 year weatherproof warranty plus a subsequent 25 years dininishing pro-rata weatherproof warranty
For Metrotile roofing tiles (paint or chip)
20 years: For surface coating - textured stone-coated tile
15 years: For surface coating - satin acrylic coated tile

- Provide this warranty on the Metrotile Roofing Systems standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years: For installation of Metrotile roof

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of installation

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Metrotile (NZ) Ltd system, or associated components and products.

1.8 QUALIFICATIONS

Installers to be Metrotile (NZ) Ltd trained fixers employed or contracted to a registered Metrotile Roofing Systems installer.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant Metrotile (NZ) Ltd maintenance information on completion of the roofing work.

Performance

1.10 FIXINGS, WIND

Design and use the fixings appropriate to Metrotile (NZ) Ltd's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT. To NZS 3604, table 10.12 **Tile battens for all wind zones**. Refer to Metrotile (NZ) Ltd Profile Specifications Summary for the selected profile, finish and uplift requirements.

1.11 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.

1.12 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. Comply with Metrotile (NZ) Ltd installation instructions and NZMRM CoP, sections 2 to 7 (**Performance, Loadings, Design, Flashings, Penetrations and Installation**), and section 10, **Pressed metal Tiles**.

1.13 DRINKING WATER

Rainwater collected from Metrotile roofs will meet the provisions of NZBC G12/AS1.

2. PRODUCTS

Materials

2.1 PRESSED METAL TILES - SATIN FINISH

Metrotile (NZ) Ltd pressed metal tiles to NZS 4217 and NZBC E2/AS1, 8.3 **Pressed metal tiles**. Fabricated from Zinalume® - protected steel with acrylic top coat. Refer to SELECTIONS for type.

2.2 PRESSED METAL TILES - TEXTURED FINISH

Metrotile (NZ) Ltd pressed metal tiles to NZS 4217 and NZBC E2/AS1, 8.3 **Pressed metal tiles**. Fabricated from Zinalume® - protected steel with natural stone granules

embedded in an acrylic base coat and final clear acrylic over glaze applied before being oven cured. Refer to SELECTIONS for type.

Components

- 2.3 **UNDERLAY**
Self supporting breather type. Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays.
- 2.4 **BATTENS**
To NZS 3604, 10.2.1.16 **Purlins and tile battens**. Radiata pine or Douglas Fir, SG6, treated H1.2. Moisture content to NZS 3602. Size, spacing and fixing to NZS 3604, table 10.12, **Tile battens for all wind zones** and to Metrotile (NZ) Ltd installation instructions.
- 2.5 **FIXINGS GENERALLY**
Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with NZBC E2/AS1 and/or NZS 3604 and Metrotile (NZ) Ltd Profile Technical Summary. For fixing patterns refer to Metrotile (NZ) Ltd Profile Technical Summary for the selected profile.
- 2.6 **NAILS**
Nails for batten fastening to Metrotile (NZ) Ltd installation instructions, sized and installed to NZS 3604 and NZS 4217. In Extra High Wind Zone areas secure the roof battens with 1 x 10g C 2.4kN 80mm purlin screw.
- 2.7 **FLASHINGS, CAPPINGS AND COVERS**
To NZBC E2/AS1, 4.0 **Flashings**, NZBC E2/AS1, 8.2.4, **Flashings and fixings**, and NZBC E2/AS1, Table 7, **Metal flashings - general dimensions**. Use ridge and hip caps, barge covers, general purpose malleable-edged flashings and side flashings supplied by Metrotile (NZ) Ltd as part of the selected tile roofing system.

3. EXECUTION

Conditions

- 3.1 **INSPECTION**
Inspect the roof framing and supporting structure and do not start work until it is complete and fully braced ready for tiling, all to the requirements of NZS 3604.
- 3.2 **STORAGE**
Stack tiles on a level, hard base, ventilated and protected from damage and weather. Do not allow moisture to build up between sheets in a stack.
- 3.3 **HANDLING**
Unload and handle tiles without soiling, scratching, crushing or other damage. Protect edges from damage.
- 3.4 **COMPLY**
Comply with the preparation, laying and fixing requirements of NZBC E2/AS1, and NZS 4217, or Metrotile (NZ) Ltd requirements where these are of a higher standard.

Application

- 3.5 **SET-OUT**
Carefully set out the roof with a measuring rod to position the battens accurately taking account of rafter lengths, overhangs into gutters and spouting and verge overhangs, all to minimise tile cutting.
- 3.6 **LAY UNDERLAY**
Refer to 4161 UNDERLAYS, FOIL AND DPC for the installation of self supporting breather type underlay.

3.7 **FIX BATTENS**

To NZS 3604. Fix battens over the underlays in straight courses, spanning at least 3 rafters, between fascia and ridge and elsewhere to Metrotile (NZ) Ltd details. Nail at every crossing to the requirements of NZS 3604, table 10.12. Square cut ends to form butt joint over rafters with joints staggered.

3.8 **LAYING**

Do not take heavy equipment onto the roof. Plan work to minimise foot traffic. Work on the roof only using appropriate footwear. Interlock, lap and lay to Metrotile (NZ) Ltd requirements and finish to ridge, hip, valley, barge and eaves to NZBC E2/AS1 8.0 Roof Claddings, 8.3 Pressed Metal Tiles, and Metrotile (NZ) Ltd required details, if not detailed elsewhere.

3.9 **NAILING**

Nail tiles to battens generally through the upstand and downturn of the tile lap as well as all elements to NZBC E2/AS1 and Metrotile (NZ) Ltd details and to nail size, type and spacing in NZS 4217, table 5. Fit neoprene washers under vertical nails for smooth-coated tiles.

3.10 **CUTTING AND BENDING**

Cut, bend and straighten tiles neatly to finish true to line and plane when in place, using installation equipment maintained in the proper condition, all to NZS 4217 and as required by Metrotile (NZ) Ltd. A full 40mm high stop end should be made at any tile termination point.

3.11 **FIT FLASHINGS, COVERS AND CAPPINGS**

Cut, fit and fix all elements true to line and plane, to NZBC E2/AS1: 4.0 Flashings, NZBC E2/AS1: 5.0 Roof/wall junctions, to Metrotile (NZ) Ltd flashing specifications, and the NZMRM COP, section 10, if not detailed elsewhere.

3.12 **PENETRATIONS**

Form to NZBC E2/AS1, 8.1.7, **Roof penetrations** and to NZS 4217, with upstands ready for flashings/overflashings. Flash and overflash all penetrations through the roof.

3.13 **PENETRATIONS AND JUNCTIONS**

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings)

Completion3.14 **MAKE GOOD**

Seal vertical nails and touch-up all chipped coatings to Metrotile (NZ) Ltd instructions.

3.15 **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.

3.16 **REMOVE**

Remove trade rubbish and unused materials from the roof and surrounds regularly during the work. Sweep down the completed roof and clean out spouting, gutters and rainwater pipes. Remove debris, unused materials and elements from the site.

4. **SELECTIONS**

For further details on selections go to www.metrotile.com

Substitutions are not permitted to the following, unless stated otherwise.

- 4.1 METROTILE PRESSED METAL TILES - SATIN FINISH
 - Profile: To match
 - Finish: Satin Finish
 - Colour: To match existing
- 4.2 METROTILE PRESSED METAL TILES - TEXTURED FINISH
 - Profile: to match existing
 - Finish: Textured finish
 - Colour: to match existing
- 4.3 METROTILE FLASHINGS, CAPPINGS AND COVERS
 - Trim type: to match existing
 - Finish: To match tiles
 - Tiles: To match tiles

4521 ALUMINIUM WINDOWS AND DOORS

1. GENERAL

This section relates to the manufacture, supply, and installation of:

- aluminium windows
- aluminium doors and frames
- hardware and furniture
- overhead glazing
- flashings

1.1 RELATED WORK

Refer to glazing sections for glass types

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of New Zealand
PQAS	Powder Coating Quality Assurance System

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC E2/AS1</u>	External moisture
<u>NZBC F4/AS1</u>	Safety from falling
<u>NZBC H1/VM1</u>	Energy efficiency
<u>NZBC H1/AS1</u>	Energy efficiency
<u>AS/NZS 1580.108.1</u>	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
<u>AS/NZS 1170.2</u>	Structural design actions - Wind loads
<u>NZS 1170.5</u>	Structural design actions - Earthquake actions - New Zealand
<u>AS/NZS 1734</u>	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
<u>AS/NZS 1866</u>	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
<u>NZS 3604</u>	Timber-framed buildings
<u>AS 3715</u>	Metal finishing - Thermoset powder coatings for architectural applications
<u>BS 3900</u>	Methods of tests for paints, Part C5: Determination of film thickness
<u>NZS 4211</u>	Specification for performance of windows
<u>NZS 4223.3</u>	Glazing in buildings - Human impact safety requirements
<u>AS/NZS 4680</u>	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
<u>WANZ Installation Guide:</u>	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 6.
<u>WANZ PQAS</u>	Powder Coating Quality Assurance System
<u>WANZ SFA 3503-03</u>	Anodic Oxide coatings on wrought aluminium for external architectural application (2005).
<u>BRANZ BU 337</u>	Protecting Window Glass from Surface Damage
<u>AAMA 2604</u>	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
<u>AAMA 2605</u>	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.
<u>US Federal Specification</u>	
<u>TT-S-001543A</u>	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
<u>TT-S-00230C</u>	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

Warranties

- 1.4 **WARRANTY - MANUFACTURER/SUPPLIER**
Provide a material manufacturer/supplier warranty:
5 years: For fabrication
Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.
- 1.5 **WARRANTY - INSTALLER/APPLICATOR**
Provide an installer/applicator warranty:
2 years: For installation
- Provide this warranty in the installer/applicator standard form.
- Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

- 1.6 **QUALIFICATIONS**
Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.
- 1.7 **COMPLIANCE**
Windows and doors to be manufactured and installed to NZBC E2/AS1.
- 1.8 **CERTIFICATION**
Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of NZS 4211.

Performance

- 1.9 **PERFORMANCE - WINDOWS AND DOORS**
To NZS 4211, including:
- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.
Refer to SELECTIONS.
- 1.10 **PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS**
The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window manufacturer.

Performance - Wind (design by contractor)

- 1.11 **WIND - NON SPECIFIC DESIGN**
Design the installation to the wind zone parameters of NZS 3604, table 5.4.
Refer to SELECTIONS for wind zone.

Finishes

- 1.12 **CERTIFY COATINGS - POWDER COATING**
Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.
The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2. PRODUCTS

Materials

- 2.1 **WINDOWS**
Refer to SELECTIONS for type and finish.
- 2.2 **DOORS**
Refer to SELECTIONS for type and finish.
- 2.3 **ALUMINIUM EXTRUSIONS**
Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.
- 2.4 **ALUMINIUM SHEET AND STRIP**
Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.
Alloy designation: 5251 - H16 or 5005 - H16
- 2.5 **STAINLESS STEEL SHEET AND STRIP**
Type: 316 austenitic steel
Finish grade: 2B (satin lustre)
- 2.6 **GLASS**
Refer to the glazing section for glass types and installation.
- 2.7 **REVEALS - TIMBER PAINTED**
Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.
- 2.8 **FLASHINGS GENERALLY**
To NZBC E2/AS1, 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components - for direct fix systems

- 2.9 **SILL PAN FLASHING**
To NZBC E2/AS1, 9.1.10.5 Window and Door Sills. Flashing for direct fix claddings to collect and drain water that may penetrate through the window or door unit. Size to extend from the inner most point of the aluminium frame out over the external face of the cladding.
- 2.10 **WANZ SUPPORT ANGLE**
Support angle, for use below the sill pan, for deeper claddings to transfer the weight of the window back to the frame. Size to suit cladding thickness.

Components

- 2.11 **GLAZING GASKETS**
Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.
- 2.12 **HARDWARE AND FURNITURE**
Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.
- 2.13 **SAFETY STAYS**
Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Table 2, Acceptable opening sizes for barriers.

Sealants

- 2.14 **STRUCTURAL SEALANT**
Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a $\pm 40\%$ movement factor complying with US Federal Specification TT S 001543A.
- 2.15 **WEATHERING/INSTALLATION SEALANT**
Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT S 0011534A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus ($\pm 25\%$ movement) to US Federal Specification TT S 00230C.
- 2.16 **FOAM TAPE**
Foam tape to NZBC E2/AS1, 9.1.10.7 **Closed cell foam tape.**

Finishes

- 2.17 **POWDER COATED ALUMINIUM - EXTRA DURABLE**
Polyester powder organic coating in accordance with WANZ PQAS and AS 3715.
- 2.18 **POWDER COATED ALUMINIUM - HIGH DUTY**
Polyester powder coating in accordance with WANZ PQAS and AAMA 2604.
- 2.19 **POWDER COATED ALUMINIUM - SUPER DUTY**
PVF² fluoropolymer powder coating in accordance with AAMA 2605 and WANZ PQAS.

3. EXECUTION

Conditions - generally

- 3.1 **DO NOT DELIVER**
Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.
- 3.2 **UNLOAD WINDOW JOINERY**
Unload, handle and store elements in accordance with the window manufacturer's requirements.
- 3.3 **AVOID DISTORTION**
Avoid distortion of elements during transit, storage and handling.
- 3.4 **PREVENT DAMAGE**
Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.
- 3.5 **PROPRIETARY ELEMENTS**
Fix in accordance with the window manufacturer's requirements.
- 3.6 **PROTECTIVE COVERINGS**
Retain protective coverings and coatings to BRANZ BU 337 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.
- 3.7 **ADDITIONAL PROTECTION**
Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

Conditions - fixings and fastenings

- 3.8 **SUPPLY OF FIXINGS**
Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless

steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

3.9 INSTALLATION FIXING

To NZBC E2/AS1, 9.1.10.8, **Attachments for windows and doors**. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings.

Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

Fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces.

3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.

Installation - windows and doors

3.14 CORROSION PROTECTION

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

3.15 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1:9.1.5 **Wall underlays to wall openings**.
- Full height 20mm jamb battens to NZBC E2/AS1 figure 72A (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

3.16 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

3.17 INSTALLATION DIRECT FIX

Install to window manufacturers details and drawings including sill pans to window and door units.

3.18 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm minimum plus any jamb scribe width at each end.

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1:9.1.6 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

3.22 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

3.23 BACK UP

When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

3.24 SEALANT FINISH

Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer. Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.

Completion - cleaning

3.25 REMOVE TRADE DEBRIS

Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.

3.26 TRADE CLEAN

Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

Completion

3.27 PROTECTIVE COVERINGS

Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades.

- 3.28 **SAFETY**
Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.
- 3.29 **IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM**
In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted only to minor surface scratching. Otherwise replace all damaged material.
- 3.30 **REMOVE**
At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.
- 3.31 **REPLACE**
Replace damaged, cracked or marked elements.

4. **SELECTIONS**

Performance

- 4.1 **THERMAL PERFORMANCE**
R-value: R0.26(as determined from NZBC H1/VM1 or H1/AS1)

Performance - Wind (design by contractor)

- 4.2 **WIND - NON SPECIFIC DESIGN**
Building wind zone Medium (refer to NZS 3604, table 5.4)

Window and door system

- 4.3 **ALUMINIUM WINDOWS**
Manufacturer: TBC
Type/location: TBC
- 4.4 **ALUMINIUM DOORS**
Manufacturer: TBC
Type/location: TBC
- 4.5 **TIMBER REVEALS**
Timber species: Radiata pine
Grade/treatment: H3.1
Thickness: TBC
Reveals: TBC
Finish: TBC

Finishes

- 4.6 **FLUOROPOLYMER POWDER COATING FINISH**
Type: PVF2 fluoropolymer powder coating
System integrity: Min 20 years
Thickness: Average of 80 microns with a minimum of 50 microns
Colour: to match existing
- 4.7 **FLASHINGS**
Material/type: TBC
Pattern: Formed to suit details provided
- 4.8 **WEATHERING SEALANT**
Brand/type: 1-part polyurethane moisture curing, elastic joint sealant
Colour: TBC

4610 GLAZING RESIDENTIAL

1. GENERAL

This section relates to the supply and fixing of glass products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC F4/AS1</u>	Safety from falling
<u>NZBC F9/AS1</u>	Means of restricting access to residential pools
<u>NZBC H1/AS1</u>	Energy Efficiency
<u>AS/NZS 1170.2</u>	Structural design actions - Wind loads
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 4211</u>	Specification for performance of windows
<u>NZS 4218</u>	Thermal insulation - Housing and Small Buildings
<u>NZS 4223.1</u>	Glazing in buildings - Glass selection and glazing
<u>NZS 4223. Supp1</u>	Glazing in buildings - Supplement 1 to <u>NZS 4223.1:2008</u> and <u>NZS 4223.4:2008</u>
<u>NZS 4223.2</u>	Glazing in buildings - Insulating glass units
<u>NZS 4223.3</u>	Glazing in buildings - Human impact safety requirements
<u>NZS 4223.4</u>	Glazing in buildings - Wind, dead, snow and live action
<u>AS/NZS 2208</u>	Safety glazing materials in buildings
<u>AS/NZS 4666</u>	Insulating glass units
<u>BRANZ BU 337</u>	Protecting window glass from damage

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

Requirements

1.4 SAMPLES

Submit samples of selected glass for review if required.

Performance

- 1.5 **ENERGY EFFICIENCY**
Provide glazing to meet the energy requirements of NZS 4218 and NZBC H1/AS1 for housing small buildings.
Refer to SELECTIONS and schedules for location and type of glazing.

2. **PRODUCTS**

Materials

- 2.1 **CLEAR FLOAT GLASS**
Clear ordinary annealed transparent float glass for general window glazing. Thickness to NZS 4223.1 and NZS 4223. Supp 1.
- 2.2 **TEXTURED, PATTERNED OR OBSCURE GLASS**
Translucent, annealed, rolled glass with a decorative pattern on one surface.
- 2.3 **LAMINATED GLASS**
Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.
- 2.4 **TOUGHENED GLASS**
Grade A Safety Glass to AS/NZS 2208.
Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas.
Refer to SELECTIONS.

Components, aluminium and uPVC glazing

- 2.5 **GLAZING TAPE AND GASKETS**
Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.
- 2.6 **SETTING BLOCKS**
Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

3. **EXECUTION**

Conditions

- 3.1 **GENERAL REQUIREMENTS**
To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.
- 3.2 **DELIVERY**
Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 337.
- 3.3 **GLASS CONDITION**
All glass to have undamaged edges and surfaces.
- 3.4 **GLASS THICKNESS**
If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by NZS 4223.1, NZS 4223.3, NZS 4223.4 and NZS 4223. Supp 1. For windows tested to NZS 4211, ensure glass meets the requirements of the window testing.
Determine the final glass thickness based on whether wind loading or human impact considerations govern.
- 3.5 **REBATE DIMENSIONS**
Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to NZS 4223.1, Section 4 Glazing.

Assembly

- 3.6 WORKING OF GLASS
All working of glass as required in NZS 4223.1.
- 3.7 EDGE WORK AND BEVELLING
Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.
- 3.8 SURFACE TREATMENT
Refer to SELECTIONS/drawings for finish.
- 3.9 SURFACE CUTTING
Refer to SELECTIONS/drawings for finish.
- 3.10 INSTALL SAFETY GLASS
To NZS 4223.3.

Application aluminium

- 3.11 INSTALL GLASS TO ALUMINIUM FRAMES
Install glass to NZS4223.1.
- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Finishing

- 3.12 SAFETY
Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.
- 3.13 MANIFESTATIONS
To NZS 4223.3, 2.2 Manifestation (making glass visible).

Completion

- 3.14 TRADE CLEAN
Clean off or remove safety indicators at completion of the building.
- 3.15 REPLACE
Replace damaged, cracked or marked glass.
- 3.16 LEAVE
Leave work to the standard required by following procedures.
- 3.17 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

Performance - wind

- 4.1 WIND ZONE - NON-SPECIFIC DESIGN
Building wind zone: Medium (as determined from NZS 3604, NZS 4223.4)

4710P PINK® BATTS® & PINK® BATTS® SILENCER® INSULATION

1. GENERAL

This section relates to Tasman Insulation **Pink® Batts®** insulation materials installed into residential buildings.

It includes:

Thermal:

- **Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Skillion Roof Insulation**
- **Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Masonry Wall Insulation**
- **Pink® Batts® 140mm Wall Insulation**
- **Pink® Batts® Steel Wall Insulation**
- **Pink® Batts® Narrow Wall Insulation**
- **Pink® Batts® SnugFloor® Underfloor Insulation**

Acoustic:

- **Pink® Batts® Silencer®**
- **Pink® Batts® Silencer® Midfloor**

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1-AS6 Protection from fire

NZBC H1/AS1 Energy efficiency

NZS/AS 1530.1 Methods for fire tests on building materials, components and structures - Combustibility test for materials

AS/NZS 3000 Electrical installations

NZS 4218 Thermal insulation - Housing and small buildings

NZS 4220 Code of practice for energy conservation in non-residential buildings

NZS 4243.1 Energy Efficiency - Large buildings - Building thermal envelope

NZS 4246 Energy efficiency - Installing bulk thermal insulation in residential buildings

AS/NZS 60598.2.2:2001 Luminaires- Particular Requirements - Recessed luminaires

AS/NZS 60695.11.5 Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Tasman Insulation New Zealand: Product Data Sheets and Installation Instructions

BRANZ Appraisal 238 - Pink® Batts® Insulation

BRANZ Appraisal 632 - Pink® Batts® SnugFloor® Underfloor Insulation

BRANZ Appraisal 767 - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company: **Tasman Insulation New Zealand**

Web: www.pinkbatts.co.nz

Telephone: 0800 746 522

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

Lifetime Warranty	For Pink® Batts® insulation products
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- Commence the warranty from the date of practical completion of the contract works.
- Provide this Warranty on the **Pink® Batts® Lifetime Warranty Certificate** form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

- 1.4 **QUALIFICATIONS, PINK® BATTS®**
 Installers to be **PinkFit® - Preferred Pink® Batts® installers**. A list of approved installers can be obtained from the web, by telephone or from the local building supplies merchant.
 Web: www.pinkbatts.co.nz
 Telephone: Freephone 0800 746 534

- 1.5 **NO SUBSTITUTIONS**
 Substitutions are not permitted to any specified Tasman Insulation **Pink® Batts®** insulation or associated products, components or accessories.

2. PRODUCTS

Materials - thermal

- 2.1 **PINK® BATTS® CEILING INSULATION**
Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.
 NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaries the insulation must withstand a 30s Needle Flame test to AS/NZS 60695.11.5. Pink® Batts® insulation meets this requirement.

- 2.2 **PINK® BATTS® WALL INSULATION**
Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.

Components

- 2.3 **FASTENERS**
 Insul anchors complete with retaining washer.
- 2.4 **TAPES**
 Proprietary plastic tape stapled across framing to retain insulation in unlined wall and ceiling locations.
- 2.5 **ADHESIVE TAPE**
 Pressure sensitive adhesive tape.

3. EXECUTION

- 3.1 **STORAGE**
 Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, compression, puncturing and damage to edges of materials. Do not use damaged or wet insulation materials.
- 3.2 **HANDLING**
 Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.
- 3.3 **INSPECTION**
 Before starting installation of blankets and slabs, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall underlays and vapour barriers are in place.

Application - general

3.4 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to NZS 4218 and NZS 4246. Install in large buildings to NZS 4243.1 and NZS 4220. Allow insulation to re-loft/relax prior to installation. Do not cover vents. Confirm with fireplace manufacturer for clearances; **Pink® Batts®** insulation need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.5 RECESSED LIGHT FITTINGS - CLEARANCE

Non-residential applications;

The clearance between insulation and recessed downlights

- 100mm gap to AS/NZS 3000, figure 4.9.
- Provide larger clearances where required by the light manufacturer.

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in AS/NZS 60598.2.2; CA 80, CA 135, IC and IC - F
- Classification type CA 80, CA 135, to AS/NZS 60598.2.2; insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to AS/NZS 60598.2.2; insulation can abut and cover over the top of the downlight
- Provide larger clearance where required by the light manufacturer.
- In a retrofit situation where recessed downlights are unclassified or unknown, ensure 100mm clearance from the insulation to AS/NZS 3000, figure 4.9.

Application, thermal insulation

3.6 INSTALL PINK® BATTS® CEILING INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Ceiling Insulation** beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the **Pink® Batts®** insulation and roof underlay. Refer to NZS 4246 for installation guidelines and **Pink® Batts®** installation instructions for detailed information.

3.7 INSTALL PINK® BATTS® WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to NZS 4246 for installation guidelines and **Pink® Batts®** installation instructions for detailed information.

Completion

3.8 CLEAN UP

Clean up as the work proceeds, so no spare offcuts or any other matter or item remain behind claddings or linings.

3.9 LEAVE

Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4. **SELECTIONS**

For further details on selections go to www.pinkbatts.co.nz.

Substitutions are not permitted to the following, unless stated otherwise.

Thermal insulation

4.1 PINK® BATTS® CLASSIC CEILING INSULATION

Location: Ceiling
Brand: **Pink® Batts® Classic Ceiling**
R-value: 3.2
Thickness: 170 mm

4.2 PINK® BATTS® CLASSIC WALL INSULATION

Location: All External Walls
Brand: **Pink® Batts® Classic Wall**
R-value: 2.2
Thickness: 90mm

4711E EXPOL UNDERFLOOR INSULATION

1. GENERAL

This section relates to **Expol** expanded polystyrene (EPS) panels fitted as underfloor thermal insulation to:

- timber framed floors

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B2/AS1</u>	Durability
<u>NZBC H1/AS1</u>	Energy efficiency
<u>AS/NZS 3000</u>	Electrical installations
<u>AS 1366.3</u>	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
<u>NZS 4218</u>	Thermal Insulation - Housing and small buildings
<u>NZS 4243.1</u>	Energy efficiency - Large buildings - Building thermal envelope
<u>AS/NZS 4859.1</u>	Materials for the thermal insulation of buildings - General criteria and technical provisions

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Expol UnderFloor Insulation brochure

Expol Technical Product Guide

BRANZ Appraisal 256 - EXPOL UnderFloor Insulation

Copies of the above literature are available from:

Web: www.expol.co.nz
 Email: sales@expol.co.nz
 Telephone: 09 634 3449 / 0800 863373
 Facsimile: 09 634 0756

Requirements

1.3 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

Performance

1.4 EXPOL INSULATION

Expol will contribute to meeting the requirements of NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope. Install to NZS 4218 for small building envelope, to NZS 4243.1 for large buildings and to the Expol technical requirements.

1.5 DURABILITY

Expol EPS insulation to comply with NZBC B2/AS1 Table 1, Durability requirements of nominated building elements.

50 years For Expol UnderFloor thermal insulation panels

Refer to the Manufacturer's literature for additional requirements.

2. PRODUCTS

Materials

- 2.1 **EXPOL UNDERFLOOR INSULATION - TIMBER FLOOR R1.4**
Expol UnderFloor, flame retardant polystyrene panels (EPS) to AS 1366.3, and to NZS 4859.1. Panels are 60mm thick.

Components

- 2.2 **WIRE GUARD - TIMBER FLOORS**
Expol Wire Guard, a paper strip used to separate exposed electrical cables from Expol UnderFloor insulation.
- 2.3 **FIXINGS - TIMBER FLOORS**
Expol non corrosive nylon fixings with a stainless steel nail to secure panels.

3. EXECUTION

Conditions

- 3.1 **DELIVERY**
Keep materials dry in transit. Take delivery of materials in an undamaged in condition. Reject all damaged materials.
- 3.2 **STORAGE**
Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and damage to edges of sheet materials. Do not use damaged sheets.
- 3.3 **HANDLING**
Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.
- 3.4 **PROTECT**
Do not subject the polystyrene to prolonged saturation or exposure to sunlight. Do not allow the polystyrene come into contact with solvents.

Installation

- 3.5 **SECURE PANELS NEW FLOORS**
Nail two fixings at opposite corners per panel, flush with the top of the joist to ensure the panel sits just below the underside of the floor.
- 3.6 **FIT PANELS**
Friction fit Expol UnderFloor panels between floor joists, with one face touching the underside of the floor. Select the correct panel width for the correct joist space. Ensure width of panel is oversize to create a snug fit. Trim edges of panel when oversize by cutting one or more of the concertina edges. Ensure separation from electric cabling. Install to Expol Technical literature and to BRANZ Appraisal 256 - Expol UnderFloor Insulation.
- 3.7 **ELECTRICAL CABLES**
Separate all electrical cables from Expol UnderFloor insulation using Expol Wire Guard, applied to the joist area to separate the cables from polystyrene. Take extreme caution when working around electrical cables.

CAUTION: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. For cables installed prior to 1989 ensure all insulation is fitted leaving the cables exposed. When fitting around recessed downlights / uplights or other electrical appliances, leave a 150mm clearance around the appliance and comply with AS/NZS 3000.

3.8 PIPES AND PLUMBING

Cut the panel and notch around difficult areas to accommodate obstacles. A polyurethane foam material may be used to seal off more difficult areas. Ensure all air gaps are sealed around the outside perimeter to retain maximum insulation.

Completion

3.9 CLEANING

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following the execution procedures.

3.10 PROTECT

Protect new work from damage.

4. SELECTIONS

4.1 EXPOL UNDERFLOOR INSULATION - TIMBER FLOORS

Location:	Below floor of new addition
Brand:	Expol UnderFloor
Layers:	single
Size:	1200mm x 560mm x 60mm
kPa:	70
R value:	R1.4
Options:	

5113G GIB® PLASTERBOARD LININGS

1. GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- bracing systems
- wet area systems

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC C/AS2-AS6</u>	Protection from fire
<u>NZBC E2/AS1</u>	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
<u>AS/NZS 2588</u>	Gypsum plasterboard
<u>AS/NZS 2589</u>	Gypsum linings - Application and finishing
<u>NZS 3604</u>	Timber-framed buildings
<u>AS/NZS 4600</u>	Cold-formed steel structures
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)

BRANZ Technical Paper P21 BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- GIB® Site Guide (Dec 2014)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB Superline® (June 2013)
- GIB® Ezybrace® Systems (2016)
- GIB Ezybrace® Bracing Software (2016)
- GIB Ezybrace® Systems (June 2011), with amendments (Dec 2014)
- GIB® Rondo® Metal Ceiling Batten Systems
- GIB-Cove®

BRANZ Appraisal 294 (2011) - GIB Ezybrace® Systems

BRANZ Appraisal 427 (2007) - GIB Aqualine® Wet Area Systems

BRANZ Appraisal 928 (2016) - GIB Ezybrace® Systems 2016

GreenTag Certification WWLCG001-001-A-2015 - GreenTag™ GreenRate/Level B for:

- GIB® Standard (10mm & 13mm)
- GIB Braceline® (10mm & 13mm)

Copies of the above literature are available at

Company: Winstone Wallboards

Web: www.gib.co.nz

Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance**1.6 INSPECTIONS AND ACCEPTANCE**

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
 - before applying finish coatings or decorative papers,
- so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

1.7 BRACING REQUIREMENTS

Braced wall systems to NZS 3604 when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems (2016) and/or GIB Ezybrace® Bracing Software (2016)
- GIB Ezybrace® Systems (2011)

Refer to drawings for location and type.

2. PRODUCTS**Materials****2.1 GIB® PLASTERBOARD**

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard

GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard

GIB Aqualine® wet area plasterboard

2.2 GIB® COVING

GIB-Cove® plasterboard coving. Refer to SELECTIONS for profile and size.

Components**2.3 CEILING BATTENS**

GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

2.4 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

- 2.5 NAILS
GIB® Nails (gold passivated).
Size: 30mm, 40mm
- 2.6 TAPE ON TRIMS AND EDGES
GIB® Goldline™ tape-on trims
GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim
- 2.7 METAL ANGLE TRIMS
GIB® galvanized steel slim angle trims.
- 2.8 CONTROL JOINTS
GIB® Rondo® P35 control joints.
GIB® Goldline™ tape-on trims

Accessories

- 2.9 ADHESIVE
Timber frame and/or steel frame:
GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.10 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi
Cove:	GIB-Cove® Bond

- 2.11 JOINTING TAPE
GIB® paper jointing tape.
- 2.12 GAP FILLER
GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3. EXECUTION

Conditions

- 3.1 STORAGE
Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (Dec 2014).
- 3.2 LEVELS OF PLASTERBOARD FINISH
Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.
- 3.3 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE
Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS 2589**.

- 3.4 **SUBSTRATE**
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (Dec 2014).

- 3.5 **TIMBER FRAME MOISTURE CONTENT**
Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1 and GIB® Site Guide (Dec 2014).

- 3.6 **PROTECTION**
Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Dec 2014).

Application

- 3.7 **INSTALL CEILING BATTENS**
Install to GIB® Rondo® Ceiling Batten Systems requirements.

- 3.8 **LINING WALLS AND CEILINGS GENERALLY**
Form to GIB® Site Guide (Dec 2014). Ensure bulk insulation thickness shall not exceed that of the wall framing.

- 3.9 **BOARD ORIENTATION**
Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

- 3.10 **FORM WET AREA SYSTEMS**
Form to GIB Aqualine® Wet Area Systems requirements.

- 3.11 **FORM BRACING SYSTEMS**
Form bracing systems to:
- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (2011)

- 3.12 **FORM CONTROL JOINTS**
Form control joints to GIB® Site Guide (Dec 2014) requirements.

- 3.13 **INSTALL COVES**
Install to GIB-Cove® literature using GIB-Cove® Bond.

- 3.14 **INSTALL TAPE-ON TRIMS**
Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

- 3.15 **FINISHING GENERALLY**
To GIB® Site Guide (Dec 2014) and AS/NZS 2589.

Completion

- 3.16 **REPLACE**
Replace damaged sheets or elements.

- 3.17 **CLEAN DOWN**
Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean.

- 3.18 **REMOVE**
Remove debris, unused materials and elements from the site.

- 3.19 **LEAVE**
Leave work to the standard required by following procedures.

4. **SELECTIONS**

Plasterboard

4.1 **GIB® STANDARD SYSTEMS WALLS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All areas except wet areas	GIB® Standard plasterboard	10mm	

4.2 **GIB® WATER RESISTANT SYSTEMS WALLS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All wet areas	GIB Aqualine® plasterboard	10mm	

4.3 **GIB® STANDARD SYSTEMS CEILINGS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All areas except wet areas	GIB® Standard plasterboard	13mm	

4.4 **GIB® WATER RESISTANT SYSTEMS CEILINGS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All wet areas	GIB Aqualine® plasterboard	13mm	

4.5 **GIB® BRACING SYSTEMS**

Refer to:

- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (2011)

For bracing element location refer to drawn documentation.

Accessories

4.6 **GIB® CORNICE**

Size/brand/type: 55mm GIB-Cove Classic

4.7 **GIB® RONDO® CEILING BATTENS**

Brand/type: GIB® Rondo® Ceiling battens

4.8 **GIB® TAPE ON EDGE OR CORNER TRIMS**

Brand/type: TBC

4.9 **EDGE PROFILES**

Brand/type: TBC

6211 WALL TILING

1. GENERAL

This section relates to the supply and installation of ceramic wall tiles.

It includes:

- cement render walls
- concrete masonry walls
- timber substrate walls

1.1 RELATED WORK

Refer to 6221 FLOOR TILING for floor tiling.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BRANZ	Good practice guide - Tiling

Warranties

Requirements

1.3 QUALIFICATIONS

Tilers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.5 ADHESIVES COMPATIBILITY

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

2. PRODUCTS

Materials

2.1 WALL TILES

Refer to SELECTIONS for product selection.

Accessories

2.2 LIQUID WATERPROOFING MEMBRANE

To AS 3740.

2.3 SAND AND CEMENT GROUT

1 part Portland cement to 2-3 parts fine sand mixed to a paste consistency with a minimum of clean water.

2.4 GROUT

Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.

2.5 **TILE ADHESIVE**
To AS ISO 13007.1.

2.6 **MOVEMENT JOINT SEALANT**
To BRANZ Good practice guide: Tiling, section 5.0.
- Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
- Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.
Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

3. **EXECUTION**

- 3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.
- 3.2 **CHECK TILES**
Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.
- 3.3 **CONFIRM LAYOUT**
Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.
- 3.4 **SETTING OUT**
Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

Conditions

- 3.5 **SERVICES AND ACCESSORIES**
Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.
- 3.6 **SUBSTRATE TEMPERATURE**
Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.
- 3.7 **LIGHTING**
Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Application - preparing new surfaces

- 3.8 **NEW SHEET LININGS**
Remove contaminants that may affect bonding or adhesion. Surface to finish clean and dry with a texture to give a complete key to the tile manufacturer's requirements and with a maximum variation in the background plane of 4mm in 2 metres.

Application - waterproof membranes

- 3.9 **INSTALL WATERPROOFING MEMBRANE**
Install waterproofing membrane between the tile adhesive and the substrate. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide - Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install waterproof membranes as follows: -

Unenclosed shower cubicle

- To 1800mm above floor and 300mm above shower rose.
- To at least 1500mm from shower rose.
- To the floor within 1500mm of the shower rose.

Bath with a shower over and no shower screen

- To 1500mm from the shower rose and top edge.
- To 1800mm above base of bath.
- To the floor within 1500mm of the shower rose.

Bath with shower over and a screen for the shower

- To 1800mm height around sides of bath.

Bath

- To 150mm minimum around the sides and along walls horizontally 150mm minimum.

Splashback to a vanity

- To 300mm minimum up wall behind the vanity.
- To the floor level at least twice the width of the vanity and 500mm min beyond it at each end.

3.10 LIQUID WATERPROOFING MEMBRANE

Apply the selected liquid waterproof membrane system to the membrane manufacturer's requirements and in accordance with AS 3740 and to BRANZ Good practice guide - Tiling, 7.0 Waterproofing interior wet areas.

Application - tile installation

3.11 TILE FIXING GENERALLY

To AS 3958.1. Apply adhesive, prepare and fix tiles by the method required by the adhesive manufacturer and tap them firmly into place.

3.12 FITTING TILES

Ensure cut edges are smooth and installed without jagged or flaked edges. Do not install single tiles in more than one piece. Maintain the heights of wall tile work in full courses to the nearest dimension. Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles. Keep joint lines, including mitres, straight and of an even width. Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.13 MOVEMENT JOINTS

Provide movement joints with a minimum width of 4mm, carried through tile and bedding and where substantial movement is anticipated, through the rigid sheet to the structure. Install joints over expansion joints, at junctions between different backgrounds, abutting other materials, at storey heights horizontally and 3 to 4 metres vertically, at internal corners and at junctions with floors and columns. Ensure joints are clean, formed, filled and with sealant inserted to the sealant manufacturer's requirements.

3.14 TILE FINISH AND JOINTS

Ensure finished surfaces are flat and true to a tolerance of ± 4 mm in 2 metres from the required plane. Clean surplus bedding material from joint spaces and tile surface. Ensure joint widths are consistent throughout the installation with 1.5mm width for dust-pressed tiles and 6mm for extruded tiles, measured at the tile face. Ensure joint alignment is consistent throughout the installation and to a tolerance of ± 4 mm in 2 metres from the detailed joint alignment.

3.15 THIN BED FIXING

Apply adhesive to a maximum 3mm bed thickness with a minimum of voids.

Notched trowel method

- For internal dry applications, spread adhesive to a uniform thickness and "rib" it with a notched trowel to the adhesive manufacturer's requirements. Press tiles and beat into place to obtain adequate coverage by adhesive on the back of each tile.

Floating method

- Apply adhesive to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering

- With a trowel butter adhesive evenly over the whole of the back of the tile, slightly thicker than the final required adhesive thickness. Press and tap firmly into position leaving no voids. Do not use "spot-fixing".

Occasionally remove a tile as fixing proceeds to check the maintenance of adequate contact with the adhesive.

3.16

THICK BED FIXING

Apply thick-bed cement based adhesive to an average 6mm bed thickness as a floated bed and to the tile manufacturer's requirements. Prepare and fix tiles by the method required by the tile manufacturer and beat and tap them firmly into place.

Grouting

3.17

APPLY GROUTING

Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to the depth of the cushion and flush with surface to cushion edge and square edge tiles. Remove surplus grout with a damp cloth and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

3.18

APPLY PROPRIETARY GROUTING

Remove spacers. Prepare joints, mix and apply grout and finish off to the tile manufacturer's requirements, uniform in colour, smooth and without voids, pinholes or low spots.

Cleaning

3.19

CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.20

ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.21

DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

4.

SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1

CERAMIC WALL TILES

Location:	Shower walls
Manufacturer:	TBC
Pattern/number:	TBC
Colour:	TBC
Edging:	TBC

4.2 TILE ADHESIVE
Location: TBC
Manufacturer: TBC
Brand/type: TBC
Trade name/number: TBC

4.3 GROUT
Location: TBC
Manufacturer: TBC
Trade name/number: TBC

Components

Spares

6221 FLOOR TILING

1. GENERAL

This section relates to the supply and installation of ceramic floor tiles.
It includes:

- concrete substrates
- timber substrate floors
- timber floor overlays

1.1 RELATED WORK

Refer to 6211 WALL TILING for wall tiling.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC D1/AS1</u>	Access routes
<u>NZBC E3/AS1</u>	Internal moisture
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS 4586	Slip resistance classification of new pedestrian surface materials
<u>NZS 4121</u>	Design for access and mobility - Buildings and associated facilities
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BRANZ	Good practice guide: Tiling

Warranties

Requirements

1.3 QUALIFICATIONS

Tilers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.5 DEFLECTION CRITERIA FOR SUSPENDED FLOORS

Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

1.6 ADHESIVES COMPATIBILITY

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

1.7 PROVIDE SPARE TILES

Provide spare tiles. Refer to SELECTIONS for type and quantity.

2. PRODUCTS

Materials

2.1 FLOOR TILES

Refer to SELECTIONS for product selection.

2.2 **REINFORCING MESH**
Galvanized 500mm x 500mm x 2.5mm steel mesh for screeds and bedding as necessary.

2.3 **SEPARATING LAYER**
Single layer heavy gauge polyethylene film.

2.4 **BUILDING UNDERLAY**
Breather type bitumen saturated kraft paper.

Components

2.5 **EXPANSION JOINT, METAL AND RUBBER**
Clear anodised aluminium/brass with metal anchor to set into in-situ concrete, cement screed/bed and complete with rubber infill.

2.6 **EXPANSION JOINT, METAL AND COMPOUND**
Aluminium/brass angles with high density foam rubber insert and jointing compound.

2.7 **EXPANSION JOINT, PLASTIC**
Rigid stabilised PVC sides with flexible central section.

Accessories

2.8 **SCREED**
Mix of 3:1 Portland cement, coarse washed sand gauged with liquid polymer additive to the tile manufacturer's stated requirements.

2.9 **CEMENT MORTAR**
Sand and cement bedding coat with liquid polymer additive, to the tile manufacturer's stated requirements.

2.10 **LIQUID WATERPROOFING MEMBRANE**
To AS 3740.

2.11 **TILE ADHESIVE**
To AS ISO 13007.1.

2.12 **SAND AND CEMENT GROUT**
1 part Portland cement to 2-3 parts fine, washed sand, mixed to a paste consistency with a minimum of clean, potable water.

2.13 **PROPRIETARY GROUT**
Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.

2.14 **MOVEMENT JOINT SEALANT**
To BRANZ Good practice guide: Tiling, section 5.0.
- Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
- Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.
Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

3. EXECUTION

3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish

3.2 CHECK TILES

Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

3.4 SETTING OUT

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

3.5 GENERALLY

Prepare surface and complete tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

Conditions**3.6 SERVICES AND ACCESSORIES**

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.7 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will achieve tile laying of the required standard.

3.8 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.9 MOISTURE CONTENT

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less.

3.10 SCREEDS

Form screeds with a deviation from plane of not more than 5mm over 3 metres.

3.11 FALLS

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5mm over 3 metres. Unless otherwise specified form screeds with the following falls:

Unless stated otherwise provide minimum fall gradients to BRANZ Good Practice Guide - Tiling, clause 6.5 Falls in floors.

- | | |
|----------------|---|
| 1 : 40 minimum | For tiled decks which also acts as a roof |
| 1 : 60 minimum | For paving over ground |
| 1 : 50 minimum | For unenclosed shower bases (to <u>NZBC E3/AS1</u> , 3.3.5) |
| 1 : 60 minimum | For enclosed shower bases |
| 1 : 50 minimum | For shower bases for people with disabilities (to <u>NZS 4121</u> , 10.5.11.3 (b).) |
| 1 : 60 minimum | For commercial kitchens or similar |

Movement joints**3.12 MOVEMENT JOINTS**

Provide movement joints with a minimum width of 4mm, carried through tile and bedding and where substantial movement is anticipated, through the rigid sheet to the structure. Install joints over expansion joints, at junctions between different backgrounds, abutting other materials, at internal corners and at junctions with floors and columns. Ensure joints are clean, formed, filled and with sealant inserted to the sealant manufacturer's requirements.

3.13 METAL EXPANSION JOINT

Accurately locate and fix joints in situ, with the bedding, or on top of the bedding, to finish flush with the installed tile and to the tile manufacturer's requirements. Fit and fix rubber/rubber compound inserts to finish flush. Fit expansion joints at regular intervals over the floor area at intervals not exceeding 4 metres, at changes in floor plane and where the floor plane is interrupted.

Waterproofing**3.14 INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS**

Install waterproofing membrane to manufacturers requirements and to BRANZ Good tiling practice, 7.0 Waterproofing interior wet areas. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide: Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install waterproof membranes as follows:

Unenclosed shower cubicle

- To 1800mm above floor and 300mm above shower rose.
- To at least 1500mm from shower rose.
- To the floor within 1500mm of the shower rose.

Bath with a shower over and no shower screen

- To 1500mm from the shower rose and top edge.
- To 1800mm above base of bath.
- To the floor within 1500mm of the shower rose.

Bath with shower over and a screen for the shower

- To 1800mm height around sides of bath.

Bath

- To 150mm minimum around the sides and along walls horizontally 150mm minimum.

Splashback to a vanity

- To 300mm minimum up wall behind the vanity.
- To the floor level at least twice the width of the vanity and 500mm min beyond it at each end.

Application - tile installation**3.15 BONDED CEMENT MORTAR**

Apply proprietary cement slurry bond coat over the whole of the floor to the tile manufacturer's requirements. Thoroughly mix and place the 40mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. Apply proprietary cement slurry bond coat to the wet mortar bed and set tiles while still tacky, firmly beating into the bedding and aligning the 3mm tile joints at the same time.

3.16 MODIFIED CEMENT BASED ADHESIVE

Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.17 MODIFIED CEMENT BASED ADHESIVE AND WATERPROOF MEMBRANE

Apply appropriate waterproof membrane to manufacturer's requirements. Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.18 PLASTER SCREED AND SEPARATING LAYER

Lay polyethylene sheet/building underlay to a smooth surface, joints lapped 100mm minimum. Place galvanized steel mesh over with spacers to centralise it in the mortar

bed. Thoroughly mix and place the proprietary screed mix to the manufacturer's requirements and compact to the required level. Ensure drying times are observed before installation of tiles by thin/thick set method.

Application - interior tile installation on timber floors

- 3.19 **TIMBER PRODUCT FLOOR, WATERPROOF MEMBRANE, MODIFIED CEMENT BASED ADHESIVE**
Apply waterproof membrane to the membrane manufacturer's requirements. Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

- 3.20 **EXPANSION JOINT, COMPOUND**
Provide expansion joints; at 4 metre intervals, at the perimeter of floors, at changes of level and around structural features. Carefully clean out the joint, insert the backing rod and fill with compound placed by gun. After the correct interval, finish the surface off flush to the compound manufacturer's requirements.

Grouting

- 3.21 **APPLY GROUTING**
Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to depth of cushion and flush with surface to cushion edge and square-edge tiles. Remove surplus grout with a damp sponge and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

- 3.22 **APPLY PROPRIETARY GROUTING**
Remove spacers. Prepare joints, mix and apply grout and finish off to the grout manufacturer's requirements, to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

Cleaning

- 3.23 **CLEAN TILES**
Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

- 3.24 **ROUTINE CLEANING**
Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.
- 3.25 **DEFECTIVE OR DAMAGED WORK**
Repair damaged or marked tiles. Replace damaged or marked tiles where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting.
- 3.26 **PROTECTION**
Provide the following temporary protection of the finished work:
Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

4. **SELECTIONS**
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 CERAMIC TILES

Location: Shower floor
 Manufacturer: TBC
 Pattern/number: TBC
 Tile size: TBC
 Colour: TBC
 Edging: TBC
 Grout width: TBC

4.2 WET AREA TILE ADHESIVE

Location: TBC
 Manufacturer: TBC
 Brand: TBC

4.3 TILE ADHESIVE

Location: TBC
 Manufacturer: TBC
 Brand/type: TBC
 Trade name/number: TBC

4.4 PROPRIETARY GROUT

Location: seperating tiles
 Manufacturer: TBC
 Brand/type: TBC
 Colour: TBC

Components

4.5 LIQUID WATERPROOFING MEMBRANE

Location: below tiles
 Brand/type: TBC

6700D DULUX PAINTING GENERAL

1. GENERAL

This section relates to the general matters related to painting work.

1.1 RELATED WORK

Refer to 6711D DULUX PAINTING EXTERIOR for exterior paint systems.
Refer to 6721D DULUX PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>AS/NZS 2311</u>	<u>Guide to the painting of buildings</u>
<u>AS/NZS ISO 9001</u>	<u>Quality management systems - Requirements</u>
<u>WorkSafe NZ</u>	<u>Guidelines for the provision of facilities and general safety in the construction industry</u>
<u>WorkSafe NZ</u>	<u>Guidelines for the management of lead-based paint</u>
<u>MPNZA</u>	<u>Specification manual</u>
<u>MPNZA</u>	<u>Painters hazard handbook</u>
<u>Health and Safety at Work Act 2015</u>	

1.4 MANUFACTURER'S DOCUMENTS

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

Dulux DuSpec specification sheets and product data sheets

Copies of relevant literature are available from **Dulux**

Web:	www.dulux.co.nz/specifier or www.duspec.co.nz
Email:	specifier@dulux.co.nz
Telephone:	0800 800 424
Facsimile:	0800 801 424

Warranties

1.5 WARRANTY

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

Product warranty: Products must be applied in accordance with application and preparation procedures according to **Dulux DuSpec Specifications and Product Data Sheets**. Contact a Dulux Trade Representative for project specific warranties.

Refer to the general section 1237WA WARRANTY AGREEMENT for the required format and details of when completed warranty must be submitted.

Requirements

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Dulux** system, or associated components and products.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation or required painting system is not covered in

this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.

1.7 QUALIFICATIONS

Painters to be members of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

1.8 CONTROL SAMPLES

Prepare samples of the finished work as scheduled, including preparation and colour as specified. Obtain written approval of the appearance before proceeding. Check colours to Dulux colour samples prior to application and keep the Dulux colour samples on site as a control reference. Refer to SELECTIONS for requirements.

Use the **Dulux** Architectural Brushouts as a basis of standard where appropriate. Order brushouts online at www.dulux.co.nz/specifier/resources/a4-colour-samples or fax requests to **Dulux NZ** Customer Services on 0800 805 424.

1.9 HEALTH AND SAFETY

Refer to the Health and Safety at Work Act 2015 and WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to WorkSafe NZ: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.10 PRIOR TO WORK COMMENCING

Before any work commences painters should verify with architect or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. Dulux normally only specify two coats of colour but with certain colours such as bold, brights and some corporate colours, three coats may be needed.

1.11 MATERIAL SAFETY DATA SHEETS

Refer to **Dulux** for the material safety data sheets for every applicable product and comply with the safety procedures listed. Keep sheets on the site. Refer to www.dulux.co.nz/specifier.

Performance

1.12 DULUX INSPECTION

Permit representatives of **Dulux** to inspect the work in progress and take samples of their products from site if requested.

1.13 INSPECTION OF THE WORK

Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2. PRODUCTS

Materials

- 2.1 **PAINT TYPES**
Use the manufacturer's complete system and only the products specified.
- 2.2 **MATERIALS GENERALLY**
Use only **Dulux** products which are guaranteed for their consistency and performance under AS/NZS ISO 9001 and APAS approval, prepared, mixed and applied as directed in the **Dulux** Duspec specification sheets, specification manuals and product data sheets.

- 2.3 **THINNERS/ADDITIVES**
Use only if and when expressly directed by **Dulux** for their particular product in a particular application.

Accessories

- 2.4 **FILLERS**
For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified preparation system.
- 2.5 **GYP SUM FILLER - INTERIOR**
Finishing compound to match the plasterboard stopping system and finishing grade gypsum plaster to match the fibrous plaster system. For interior surfaces such as paper faced plasterboard use **Dulux** Professional Ultra 5 Surface Prep & Finish as an aid to achieving a Level 5 finish.

3. EXECUTION

Conditions

- 3.1 **EXECUTION**
To conform to manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311, the MPNZA Specification manual, and WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry.
- 3.2 **PREPARE**
Prepare surfaces to Dulux's requirements.
- 3.3 **COATED SURFACES**
Ensure that substrate surfaces are able to achieve the specified finish.
- 3.4 **PRE-PRIMED SURFACES**
Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.
- 3.5 **BRUSH DOWN**
Brush down surfaces immediately before application, to remove dust, dirt and loose material.
- 3.6 **COMPATIBILITY**
Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.
- 3.7 **TREATED SURFACES**
Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.
- 3.8 **ANCILLARY SURFACES**
The coatings listed in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-

faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

3.9 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.10 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation

3.11 PREPARATION

Refer to the DuSpec specification sheets for detailed substrate preparation notes relating to SELECTIONS contained in:

- 6711D DULUX PAINTING EXTERIOR, 6721D DULUX PAINTING INTERIOR, 6711DE DULUX ENVIRONMENTAL PAINTING EXTERIOR and 6721DE DULUX ENVIRONMENTAL PAINTING INTERIOR.
- www.duspec.co.nz.

Application - before applying final coatings

3.12 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.13 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP treated joinery has dried sufficiently to lose odour.

3.14 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.15 CONCEALED METAL SURFACES

Apply primer to suit the coating system to all metal surfaces which will be concealed when incorporated into the building.

3.16 DOORS

Prime or seal and paint all six faces of doors before hanging.

Application - generally

3.17 PAINTING GENERALLY

Comply with the **Dulux** DuSpec specification sheets, product data sheets and the additional requirements of this work section.

3.18 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.19 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.20 SEQUENCE OF OPERATIONS

Painting work to generally the following sequence:

- Complete surface preparation before commencing painting
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by **Dulux**
- Allow the full drying times between coats laid down by **Dulux**
- Do not expose primers, sealers and undercoats beyond a few days before applying the next coat
- Finish broad areas before painting trim
- Ensure batch numbers of tins are matched for whole areas
- Internally paint ceilings before walls and walls before joinery, trim and other items.

3.21 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of **Dulux** and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.22 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

3.23 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.24 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the **Dulux** paint system specified.

3.25 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- uniform finish, colour, texture, sheen and hiding power
- the specified number of coats applied
- no blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, brush marks, ladder marks and blistering
- proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application

Completion

3.26 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

3.27 CLEAN EQUIPMENT

Use **Dulux** EnviroWash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal. Phone 0800 800 424 for information regarding this system.

3.28 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

3.29 REMOVE

Remove dropsheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

- 3.30 **REPLACE HARDWARE**
Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

4. **SELECTIONS**
Substitutions are not permitted to the following, unless stated otherwise.

- 4.1 **SELECTIONS**
Refer to 6711D DULUX PAINTING EXTERIOR and 6721D DULUX PAINTING INTERIOR for selections.
Refer to 6711DE DULUX ENVIRONMENTAL PAINTING EXTERIOR and 6721DE DULUX ENVIRONMENTAL PAINTING INTERIOR for selections.

6711D DULUX PAINTING EXTERIOR

1. GENERAL

This section relates to the surface preparation and painting of new and existing exterior substrates using **Dulux** exterior paint systems.

1.1 RELATED WORK

Refer to 6700D DULUX PAINTING GENERAL for general matters related to painting work.

2. PRODUCTS

2.1 PRODUCTS

Refer to 6700D DULUX PAINTING GENERAL for product clauses.

3. EXECUTION

3.1 EXECUTION

Refer to 6700D DULUX PAINTING GENERAL for execution clauses.

4. SELECTIONS

For further details on selections go to www.dulux.co.nz/specifier.

Substitutions are not permitted to the following, unless stated otherwise.

Refer to DULUX DuSpec for up to date VOC levels as these are subject to change.

Fibre cement sheet substrates - new cladding

4.1 EXTERIOR TIMBER NEW - TRIM, DOORS AND FRAMES - WATER BASED ENAMEL

Gloss level:	Semi Gloss
Coating type:	Water based enamel
System:	<u>DuSpec NZ SD09147</u>
1st coat:	DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m ² /L
2nd coat:	DULUX Aquanamel @ 16 m ² /L
3rd coat:	DULUX Aquanamel @ 16 m ² /L

4.2 EXTERIOR FIBRE CEMENT SHEET NEW - CLADDING - PAINT

Gloss level:	Semi Gloss
Coating type:	Water based
System:	<u>DuSpec NZ SD09169</u>
1st coat:	DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m ² /L
2nd coat:	DULUX Weathershield X10 @ 16 m ² /L
3rd coat:	DULUX Weathershield X10 @ 16 m ² /L

6721D DULUX PAINTING INTERIOR**1. GENERAL**

This section relates to the surface preparation and painting of new and existing interior substrates using **Dulux** interior paint systems.

1.1 RELATED WORK

Refer to 6700D DULUX PAINTING GENERAL for general matters related to painting work.

2. PRODUCTS**2.1 PRODUCTS**

Refer to 6700D DULUX PAINTING GENERAL for product clauses.

3. EXECUTION**3.1 EXECUTION**

Refer to 6700 PAINTING GENERAL for execution clauses.

4. SELECTIONS

For further details on selections go to www.dulux.co.nz/specifier.

Substitutions are not permitted to the following, unless stated otherwise.

Refer to DULUX DuSpec for up to date VOC levels as these are subject to change.

Paperfaced plasterboard substrates - new ceilings**4.1 INTERIOR PAPERFACED PLASTERBOARD NEW - CEILINGS - PAINT**

Gloss level: Flat
 Coating type: Water based
 System: DuSpec NZ SD09005
 Fire rating: Group Number 1-S, Report Number 5054, NZBC C/VM2 A1.5
 1st coat: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m²/L
 2nd coat: DULUX Professional Tintable Ceiling Flat @ 12.8 m²/L
 3rd coat: DULUX Professional Tintable Ceiling Flat @ 12.8 m²/L

4.2 INTERIOR PAPERFACED PLASTERBOARD NEW - CEILINGS - WET AREAS - PAINT

Gloss level: Flat
 Coating type: Water based
 System: DuSpec NZ SD12409
 Fire rating: Group Number 1-S, Report Number 5054, NZBC C/VM2 A1.5
 1st coat: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m²/L
 2nd coat: DULUX Ceiling White Plus Kitchen & Bathroom @ 12 m²/L
 3rd coat: DULUX Ceiling White Plus Kitchen & Bathroom @ 12 m²/L

Paperfaced plasterboard substrates - new walls**4.3 INTERIOR PAPERFACED PLASTERBOARD NEW - WALLS - PAINT**

Gloss level: Low Sheen
 Coating type: Water based
 System: DuSpec NZ SD09023
 Fire rating: Group Number 1-S, Report Number 5054, NZBC C/VM2 A1.5
 1st coat: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m²/L
 2nd coat: DULUX Wash & Wear 101 @ 16 m²/L
 3rd coat: DULUX Wash & Wear 101 @ 16 m²/L

4.4 INTERIOR PAPERFACED PLASTERBOARD NEW - WALLS - WET AREAS - PAINT

Gloss level: Low Sheen
 Coating type: Water based
 System: DuSpec NZ SD09011
 Fire rating: Group Number 1-S, Report Number 5054, NZBC C/VM2 A1.5

1st coat: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m²/L
2nd coat: DULUX Wash & Wear Plus Kitchen & Bathroom @ 16 m²/L
3rd coat: DULUX Wash & Wear Plus Kitchen & Bathroom @ 16 m²/L

Timber substrates - new trim, doors, frames, etc - paint

4.5 INTERIOR TIMBER NEW TRIM, DOORS AND FRAMES - WATER BASED PAINT

Gloss level: Semi Gloss
Coating type: Water based enamel
System: DuSpec NZ SD08884
Fire rating: Group Number 3, Report Number 5095, NZBC C/VM2 A1.5
1st coat: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16 m²/L
2nd coat: DULUX Aquanamel @ 16 m²/L
3rd coat: DULUX Aquanamel @ 16 m²/L

7120 HOT & COLD WATER SYSTEM

1. GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC B2/AS1</u>	Durability
<u>NZBC C/AS1-AS7</u>	Protection from fire
<u>NZBC G4/AS1</u>	Ventilation
<u>NZBC G12/VM1</u>	Water supplies
<u>NZBC G12/AS1</u>	Water supplies
<u>NZBC H1/AS1</u>	Energy Efficiency
<u>AS/NZS 2492</u>	Cross Linked Polyethylene (PE-X) pipe for pressure applications
<u>AS/NZS 2537.2</u>	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
<u>AS/NZS 2642.1</u>	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
<u>AS/NZS 2642.2</u>	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
<u>AS/NZS 2642.3</u>	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
<u>AS/NZS 2845.1</u>	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
<u>AS/NZS 3500.1</u>	Plumbing and drainage - Water services
<u>AS/NZS 3500.4</u>	Plumbing and drainage - Heated water services
<u>AS/NZS 3500.5</u>	Plumbing and drainage - Housing installations
<u>NZS 3501</u>	Specification for copper tubes for water, gas and sanitation
<u>AS/NZS 4130</u>	Polyethylene (PE) pipes for pressure applications
<u>NZS 4305</u>	Energy efficiency domestic type hot water systems
<u>NZS 4602</u>	Low pressure copper thermal storage electric water heaters
<u>NZS 4607</u>	Installation of thermal storage electric water heaters: valve-vented systems
<u>NZS 4617</u>	Tempering (3-port mixing) valves
<u>AS/NZS 5601.1</u>	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.
<u>Gas (Safety and Measurement) Regulations 2010</u>	
<u>Plumbers, Gasfitters and Drainlayers Act 2006</u>	
<u>NZ Backflow Testing Standard: NZ Backflow Testing Standard 2011, Field testing of backflow prevention devices and verification of air gaps</u>	

Requirements

1.2 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

Warranties

1.3 WARRANTY

Provide warranty for:

2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Performance

1.4 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1, Section 18, **Testing and commissioning**, for cold water.

- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 18.3.1 **Hydrostatic test**. Test storage tanks to AS/NZS 3500.1, 18.3.2 **Storage tanks**.

and

AS/NZS 3500.4, Section 9, **Testing and commissioning**, for hot water.

- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9 **Testing**. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 **Testing**.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed.

Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2. PRODUCTS

2.1 POLYPROPYLENE RANDOM WATER PIPE

PP-R Polypropylene pipes to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/VM1.

2.2 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.3 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/AS1 3.4 Backflow protection, and NZBC G12/AS1, table 2, Selection of Backflow Protection.

2.4 TEMPERING VALVE

Tempering valve to NZS 4617 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.5 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

Components

2.6 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

3. EXECUTION

- 3.1 **EXECUTION GENERALLY**
Generally carry out the whole of this work and tests to NZBC G12/VM1 or NZBC G12/AS1.
- 3.2 **HANDLE AND STORE**
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.
- 3.3 **CORE HOLES AND SLEEVES**
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.
- 3.4 **CONCEAL**
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.
- 3.5 **CORROSION**
Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.
- 3.6 **THERMAL MOVEMENT**
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.
- 3.7 **PIPE SIZE**
Flow rates to each outlet to be no less than those given in NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.
- 3.8 **ELECTROLYTIC ACTION**
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 3.9 **EXCAVATE**
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

- 3.10 **JOINTING POLYPROPYLENE PIPE**
Fusion weld joints to manufacturer's requirements.

Application - Pipework installation

- 3.11 **POTABLE WATER SUPPLY PIPEWORK INSTALLATION**
From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

- 3.12 **HOT WATER PIPEWORK**
Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/VM1 or NZBC G12/AS1, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and G12/VM1 or G12/AS1.

- 3.13 **EQUIPOTENTIAL BONDING**
Earth metallic water supply pipe and metallic sanitary fixtures to NZBC G12/AS1, 9.0.

- 3.14 **IN-LINE FILTER**
Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

- 3.15 **SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES**
Non-gas (electric, wet-back, solar etc) water heating appliances to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation.

- 3.16 **PENETRATIONS**
Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Installation - Valves

- 3.17 **INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED**
Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

Completion

- 3.18 **LABEL**
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

- 3.19 **CLEAN IN-LINE FILTER**
Clean all in-line filters on completion of works.

- 3.20 **REPLACE**
Replace damaged or marked elements.

- 3.21 **LEAVE**
Leave work to the standard required by following procedures.

- 3.22 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

Hot water systems

7430 DRAINAGE

1. GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

<u>NZBC B1/AS1</u>	Structure
<u>NZBC E1/AS1</u>	Surface water
<u>NZBC G13/AS3</u>	Plumbing and Drainage
<u>AS/NZS 1254</u>	PVC-U pipes and fittings for Stormwater and Surface Water applications
<u>AS/NZS 1260</u>	PVC-U pipes and fittings for drain, waste and vent applications
<u>AS/NZS 2032</u>	Installation of PVC pipe systems
<u>AS/NZS 2033</u>	Installation of Polyethylene pipe systems
<u>AS 2439.1</u>	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
<u>AS/NZS 2566.1</u>	Buried Flexible Pipelines - Structural Design
<u>AS/NZS 2566.2</u>	Buried Flexible Pipelines - Installation
<u>NZS 3104</u>	Specification for concrete production
<u>AS/NZS 3500.2</u>	Plumbing and drainage - Sanitary plumbing and drainage
<u>NZS 3604</u>	Timber-framed buildings
<u>NZS 4229</u>	Concrete masonry buildings not requiring specific engineering design
<u>AS/NZS 4671</u>	Steel reinforcing materials
<u>AS/NZS 5065</u>	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
<u>Plumbers, Gasfitters and Drainlayers Act 2006</u>	

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2. PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

2.3 POLYETHYLENE PIPES

Polyethylene pipes and fittings to AS/NZS 5065.

2.4 OVERFLOW RELIEF GULLIES - AS/NZS 3500.2

Overflow relief gullies complete with grating to AS/NZS 3500.2.

2.5 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.6 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding & surround: Crushed rock or gravel screenings of nominal size of 7 - 10 mm.

Backfill material: Excavated material from the trench (free from rock, hard matter and organic material) containing no soil lumps larger than 75 mm.

3. EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs. Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
- NZBC G13/AS2, 5.6, **Proximity of Trench to Building**, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 DRAINAGE GENERALLY - AS/NZS 3500.2 & NZBC E1/AS1

Carry out drainage work and tests to AS/NZS 3500.2, as modified by NZBC G13/AS3 (foul water), NZBC E1/AS1 (stormwater). Lay uPVC pipe systems to relevant sections of AS/NZS 2032, NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and NZS 2566.1.

3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.5 INSTALL OVERFLOW RELIEF GULLIES

Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

3.6 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

3.7 INSTALL SURFACE WATER SUMP

To NZBC E1/AS1, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.8 INSTALL FOUL WATER INSPECTION CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing to NZBC G13/AS2, 5.7 **Access points**. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.9 SOAKHOLES OR TRENCHES

Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.

3.10 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

3.11 FIELD TEST

Field test drains for watertightness (PVC-U to AS/NZS 2032 or AS/NZS 2566. 2 Appendix N) to the satisfaction of the territorial authority inspector.

3.12 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL FOR PVC-U PIPE

Place and rake in bedding material so as to support the pipe once laid. Embedment material shall be placed uniformly along and around the pipe to ensure uniform density of side support and overlay with no distortion, dislodgment or damage to the pipeline. Following placement, the embedment material shall be compacted in layers to uniformly support the pipe. Trench fill material shall be placed on the pipe embedment and compacted to fill the trench, with care taken to avoid impact loading of the pipe.

4. SELECTIONS

4.1 POLYETHYLENE PIPES

Brand/type: TBC

4.2 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Location: Refer to plans

Type: Refer to bedding detail type D

7701 ELECTRICAL BASIC

1. GENERAL

This section relates to the wiring for domestic, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<u>NZBC E2/AS1</u>	External moisture
<u>NZBC F6/AS1</u>	Visibility in escape routes
<u>NZBC F7/AS1</u>	Warning systems
<u>NZBC G4/AS1</u>	Ventilation
<u>NZBC G9/AS1</u>	Electricity
<u>AS/NZS 1125</u>	Conductors in insulated electric cables and flexible cord
<u>AS/NZS 1768</u>	Lightning protection
<u>AS/NZS 2201.1</u>	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
<u>AS 2293.1</u>	Emergency escape lighting and exit signs for buildings - System design, installation and operation
<u>AS 2293.3</u>	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
<u>AS/NZS 3000</u>	Electrical installations (known as the Australian/New Zealand Wiring Rules)
<u>AS/NZS 3008.1.2</u>	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
<u>AS/NZS 3100:2009</u>	Approval and test specification-general requirements for electrical equipment
<u>AS/NZS 3112</u>	Approval and test specification - Plugs and socket-outlets
<u>AS/NZS 3113</u>	Approval and test specification - Ceiling roses
<u>AS/NZS 3190</u>	Approval and test specification - Residual current devices (current-operated earth-leakage devices)

<u>AS/NZS 3350.1</u>	Safety of household and similar electrical appliances - General requirements
<u>AS/NZS 3439.3</u>	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms
NZS 4514	Interconnected smoke alarms for houses
<u>AS/NZS 5000.2</u>	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
<u>AS/NZS 60598.2.2:2001</u>	Luminaires - Particular requirements - Recessed luminaires
IEC 61643	Components for low voltage surge protection devices
<u>Electricity (Safety) Regulations 2010</u> (Reprint as at 4 April 2016)	
<u>TCF Premises Wiring Code of Practice 2011</u>	

Warranties

1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year: Warranty period

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

Requirements

1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2 and TCF Premises Wiring Code of Practice 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.

1.5 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

1.6 SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER

Before installation work commences obtain from the electrical engineer a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulation 58.

1.7 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

1.8 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

1.9 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

2. PRODUCTS

2.1 MAINS SUPPLY, SINGLE PHASE

Tough plastic sheathed neutral screened cable to AS/NZS 4961 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits: Domestic: 1.5mm² on 10 amp MCBs

Lighting circuits: Commercial: 1.5mm² on 16 amp MCBs

Power circuits: 2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
 2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
 2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
 2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres

Hot water cylinder circuits: Single phase: 2.5mm² on 20 amp MCBs

Range/oven/hob circuits: Single phase: 6mm² on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C.

2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.4 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 3439.3 and installed in accordance with AS/NZS 3000. Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.5 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.6 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.7 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.

2.8 HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.9 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3100, AS/NZS 3112 and AS/NZS 3113, single or multi gang as detailed.

2.10 SMOKE ALARMS

Type 1 domestic smoke alarm to NZBC F7/AS1. 1.2 Descriptions of alarm systems. Alarm to AS 3786. A wired 230 volt ionised smoke detector type.

- 2.11 **SURGE PROTECTION**
Protection for the homes appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.
- 2.12 **BATTEN HOLDERS**
Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.
- 2.13 **LIGHT FITTINGS**
Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.
- 2.14 **RESIDENTIAL RECESSED LIGHT FITTINGS**
Residential recessed luminaires to AS/NZS 60598.2.2, types IC-F, IC, CA-80 or CA-135 only.
- 2.15 **EXHAUST FANS**
Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 3350.1.
- 2.16 **HEATED TOWEL RAILS**
Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 3350.1, scratch resistant powdercoated or chrome finish.
- 2.17 **OUTDOOR SWITCHES & SOCKETS**
Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.
- 3. **EXECUTION**
 - 3.1 **MAIN SUPPLY**
Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.
 - 3.2 **METER BOX**
Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1 fig 69. Arrange for meter installation and connection.
 - 3.3 **DISTRIBUTION BOARD**
Fit to AS/NZS 3000 and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.
 - 3.4 **CIRCUIT PROTECTION**
Install MCBs at distribution board to AS/NZS3000 to protect each final sub circuit.
 - 3.5 **EARTH BONDS**
Bond together and to earth all plumbing fittings not adequately isolated, to AS/NZS 3000, the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.
 - 3.6 **MAIN EARTH**
Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.
 - 3.7 **EARTH LEAKAGE PROTECTION**
Install RCD protection to AS/NZS 3000.

- 3.8 **RCD - DOMESTIC INSTALLATIONS**
Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.
- 3.9 **RCD - SPECIFIC INSTALLATIONS**
Install 30mA RCDs at the distribution board.
Install fixed wired RCD protected outlets (SRCD) in the following areas:
 - Wet areas: bathrooms, laundries, kitchens.
 - Near pools and water features.
 - Where intended for use with cleaning equipment.
 - Hand-held tools subject to movement in use, i.e. work-shops, garages.
- 3.10 **SET-OUT**
The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.
- 3.11 **CABLING**
Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.
- 3.12 **CABLING CIRCUITS**
Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.
- 3.13 **WALL BOXES**
Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.
- 3.14 **SWITCH AND SOCKET UNITS**
Fit all single and double switch units, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units:	1000mm above finished floor
Socket Units:	150mm above work benches
	400mm above finished floor

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.
- 3.15 **ISOLATING SWITCHES**
Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.
- 3.16 **LIGHT FITTINGS**
Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.
- 3.17 **EXTRA LOW VOLTAGE LIGHTING**
Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.18 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;

The clearance between insulation and recessed downlights;

- Leave 100mm gap to AS/NZS 3000, figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in AS/NZS 60598.2.2; CA 80, CA 135, IC and IC - F.
- Classification type CA 80, CA 135, to AS/NZS 60598.2.2; insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to AS/NZS 60598.2.2; insulation can abut and cover over the top of the downlight
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to AS/NZS 3000, figure 4.9.

3.19 ELECTRIC HOT WATER SYSTEM

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.20 SMOKE ALARMS

Install Type 1 domestic smoke alarm system to NZBC F7/AS1 3.0 Domestic smoke alarms, NZS 4514 and to the alarm manufacturer's requirements. Fit neatly and without damage to the surrounding finish.

3.21 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

3.22 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.23 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000 and the NZBC G9/AS1
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.24 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer's recommendations:

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points.

Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturer's specifications using recommended fittings and sealants to maintain the products integrity. Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

- 3.25 **LABELLING**
Include label under each controller, switch and circuit breaker on distribution boards.
Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Completion

- 3.26 **COMPLETION**
Leave installation operating correctly, with equipment clean and operational.

4. SELECTIONS

Materials

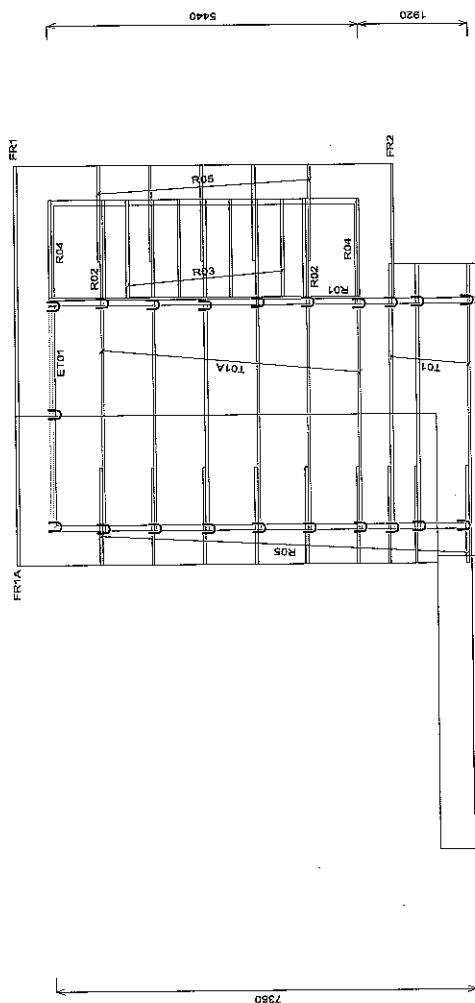
- 4.1 **SELECTIONS - FITTINGS AND HARDWARE**
Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

APPENDIX 1 – Truss design

Please find attached truss design

4030 1770

FR1



FIXINGS KEY	
A - Pair of Lumberlock Joint Bangers	
B - Lumberlock JHS047 Joint Banger	
C - Lumberlock JH3047 Joint Banger	
D - Lumberlock JH3047 Joint Banger	
E - Lumberlock JH3047 Joint Banger	
F - Lumberlock SPH104S Split Bangor (Pair)	
G - Lumberlock SPH104S Split Bangor (Pair)	
H - Lumberlock SPH120S Split Bangor (Pair)	
I - Single Lumberlock MultiRing	
J - Pair of Lumberlock MultiRings	
K - Pair of Lumberlock MultiRings	
L - Single SS3030 Street Back Strap	
M - Single SS3030 Street Back Strap	
N - Single Lumberlock CT200 Ceiling Tie	
O - Pair of Lumberlocks CT200 Ceiling Ties	
P - Single Lumberlock CT400 Cyclone Tie	
Q - Single Lumberlock CT400 Cyclone Tie	
R - Single Lumberlock NMI Nudipole	
S - Single Lumberlock NMI Nudipole	
T - Single Lumberlock CP400 Porfin Cleat	
U - Single Lumberlock CP400 Porfin Cleat	
V - Pair of Lumberlocks CP300 Porfin Cleats	
X - Single Lumberlock CP300 Porfin Cleat	
Y - Pair of Lumberlocks CP300 Porfin Cleats	
Z - Pair of Lumberlocks CP300 Porfin Cleats	
aa - Pair of Lumberlock Tower Connectors	
bb - Pair of Lumberlock Tower Connectors	

NOTES: Refer to Lumberjack Timber Contractors Characteristic Loadings Brochure, 08/2014 All Trusses to have minimum of 7/16x3.15mm power driven nails plus a pair of 10mm Deq. from Truss to upper beam unless otherwise specified. This apply to all external or load bearing internal walls. All unspecified Truss to Truss connections require a minimum of 2/190x3.15mm power driven nails. For fixed C/Side C/Purin Clasts was 2/14x 4.75mm hex head galvanised screws into Top Plate (or Beam) and load galvanised screws into Top Plate (or Beam). 2/14x 4.75mm hex head galvanised screws into Truss. For C/Side C/Purin Clasts was 2/14x 4.75mm hex head galvanised screws into Top Plate (or Beam), and load galvanised screws into Top Plate (or Beam), and load galvanised screws into Truss. 2/14x 4.75mm hex head galvanised screws into Truss.	NOTES: Refer to Lumberjack Timber Contractors Characteristic Loadings Brochure, 08/2014 All Trusses to have minimum of 7/16x3.15mm power driven nails plus a pair of 10mm Deq. from Truss to upper beam unless otherwise specified. This apply to all external or load bearing internal walls. All unspecified Truss to Truss connections require a minimum of 2/190x3.15mm power driven nails. For fixed C/Side C/Purin Clasts was 2/14x 4.75mm hex head galvanised screws into Top Plate (or Beam) and load galvanised screws into Top Plate (or Beam). 2/14x 4.75mm hex head galvanised screws into Truss. For C/Side C/Purin Clasts was 2/14x 4.75mm hex head galvanised screws into Top Plate (or Beam), and load galvanised screws into Top Plate (or Beam), and load galvanised screws into Truss. 2/14x 4.75mm hex head galvanised screws into Truss.
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MiTek 20/20 Engineering 4.6.6.334

www.mitek.nz.co.nz

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PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.6

ISSUED BY: **MiTek New Zealand Limited**
TO: **Hamilton Building Supplies Ltd**
IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **MT22459C** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20® truss design program has been developed by MiTek New Zealand Limited for the design of MiTek® timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20® are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clauses B1 and B2 of the New Zealand Building Code.

On behalf of MiTek New Zealand Limited, and subject to:

- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
- v) The design being undertaken by the accredited fabricator under the terms of the software licence
- vi) Timber is graded to the requirements of NZS 3603:1993
- vii) Minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003

I believe on reasonable grounds that the trusses, if constructed in accordance with the MiTek 20/20® truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than \$500,000.

On behalf of MiTek New Zealand Limited,

Date: Monday, 21 August 2017

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited

Job: MT22459C

Client:
Phone:Site: PROPOSED KROMHOUT EXTENSION
208 NORTH STREET - TE AWAMUTUDescription:
Building Consent No.:
MITek 20/20 Engineering 4.6.6.324

Phone:

Printed: 16:18:54 21 Aug 2017

MITek New Zealand Limited

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Hamilton Building Supplies Ltd**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MITek 20/20® TRUSS DESIGN DATA

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

Job Details**Roof Truss**

Timber Group: Truss MSGx45 H1.2

Roof

Material: Metal Tiles
Dead Load: 0.210 kPa
Restraints: 400 mm centres
Live Load: Q_{ur} = 0.250 kPa
Q_c = 1.100 kN

Importance Level : 2

Pitch: 20.000 deg

Ceiling

Material: Gib Board 13mm
Dead Load: 0.200 kPa
Restraints: 600 mm centres
Live Load: Q_c = 1.400 kN

Design Working Life : 50 years

Nominal Overhang: 600 mm

Wind

Area: High (44.0 m/s)
Pressure Coeff: C_{pe} = varies; C_{pi} = -0.30, 0.20

The minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003. The timber for these MiTek® trusses shall be graded to the requirements of NZS 3603:1993. Proprietary fixings and timber connectors shall be selected in accordance with NZS3604:2011 Section 4 - Durability.

MITek® Truss List

Legend: * = detail only, ? = input only, ~~xxx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	4030	20.000	900	*R03	7	1725	20.000	450
T01	3	4030	20.000	900	*R04	2	1725	20.000	900
T01A	6	4030	20.000	900	*R05	14	1700	20.000	900
*FR1	1	4385	20.000	900					
*FR1A	1	2615	20.000	900					
*FR2	1	2370	20.000	900					
*R01	1	5440	0.000	900					
*R02	2D	1725	20.000	450					

Total quantity : 39

The computer design input has been carried out by:

Signed:



Date: Monday, 21 August 2017

Name of Detailer: Scott Johnson

Qualifications and Title: Detailer (Mitek C.O.C)

On behalf of: Hamilton Building Supplies Ltd

APPENDIX 2 – Lumberlok fixings manual

Please find attached Lumberlok fixings manual

GABLE END BRACING OVER ROOF SECTION OF END WALLS



- ★ Covers bracing of the roof section on gable end construction.
- ★ Includes bracing on extra high gables.
- ★ All timber to be minimum grade SG8 as defined in NZS 3604:2011 apart from gable end webs which are either SG6 or SG8 (see Tables 1A & 1B).
- ★ Tables cover gable end truss installed as single component 45mm thick, double component 90mm thick, 45x70mm or 45x90mm webs on flat.
- ★ Design assumes restraints are provided at the ceiling and roof lines.
- ★ Bracing covers loading conditions as per NZS 3604:2011 up to Extra High wind and includes full height brick veneer gables.

TABLE 1A - STRONGBACK LOCATION FOR WEBS @ 600MM CRS.

WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs				45x70 on flat		45x90 on flat	
					2/ 70x45		2/ 90x45					
	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8
LOW	1800	2000	2000	2200	2300	2550	2500	2750	2450	2700	3150	3450
MEDIUM	1650	1800	1800	2000	2100	2300	2250	2500	2150	2450	2800	3150
HIGH	1450	1600	1600	1750	1850	2050	2000	2200	1800	2150	2350	2800
VERY HIGH	1300	1500	1450	1600	1700	1850	1850	2050	1600	1900	2050	2450
EXTRA HIGH	1150	1350	1300	1500	1600*	1750*	1750*	1900*	1450	1700	1850*	2200*

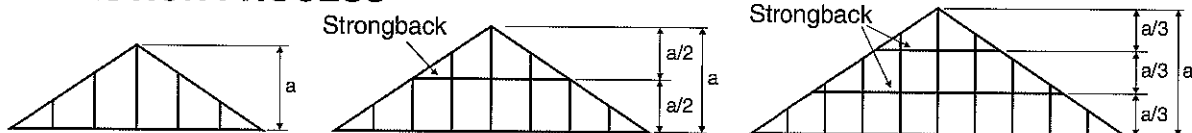
TABLE 1B - STRONGBACK LOCATION FOR WEBS @ 400MM CRS.

WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs				45x70 on flat		45x90 on flat	
					2/ 70x45		2/ 90x45					
	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8
LOW	2100	2300	2250	2500	2650	2900	2850	3150	2800	3100	3600	3900
MEDIUM	1900	2100	2050	2250	2400	2650	2600	2850	2550	2800	3300	3600
HIGH	1700	1850	1850	2000	2100	2350	2300	2550	2250	2500	2850	3200
VERY HIGH	1550	1700	1700	1850	1950	2150	2100	2350	1950	2300	2550	2950
EXTRA HIGH	1400	1600	1550	1750	1850*	2000*	2000*	2200*	1800	2100	2300*	2700*

*Use these values for full height brick veneer attached to gable end.

Please note that the maximum height of brick veneer on a gable end wall is 5.5m.

SELECTION PROCESS



- Where (a) is less than or equal to (h) - no strongback required.

- Where (a) is greater than (h) but less than 2(h) - lower strongback is required.
- Locate the strongback at height of (a/2).

- Where (a) is greater than 2(h) but less than 3(h) - lower and upper strongbacks are required.
- Locate strongbacks at height increments of (a/3).

STRONGBACK OPTIONS

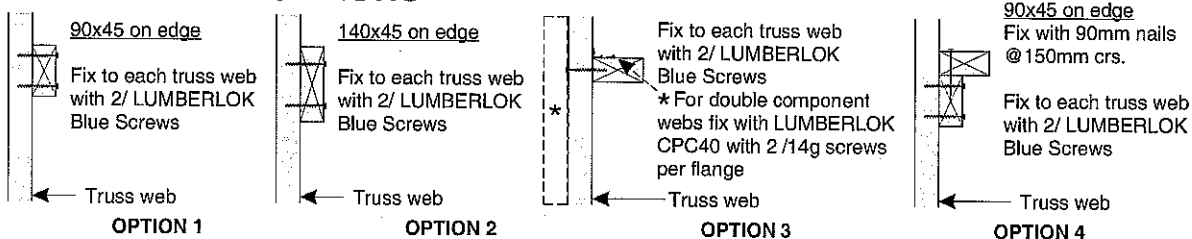
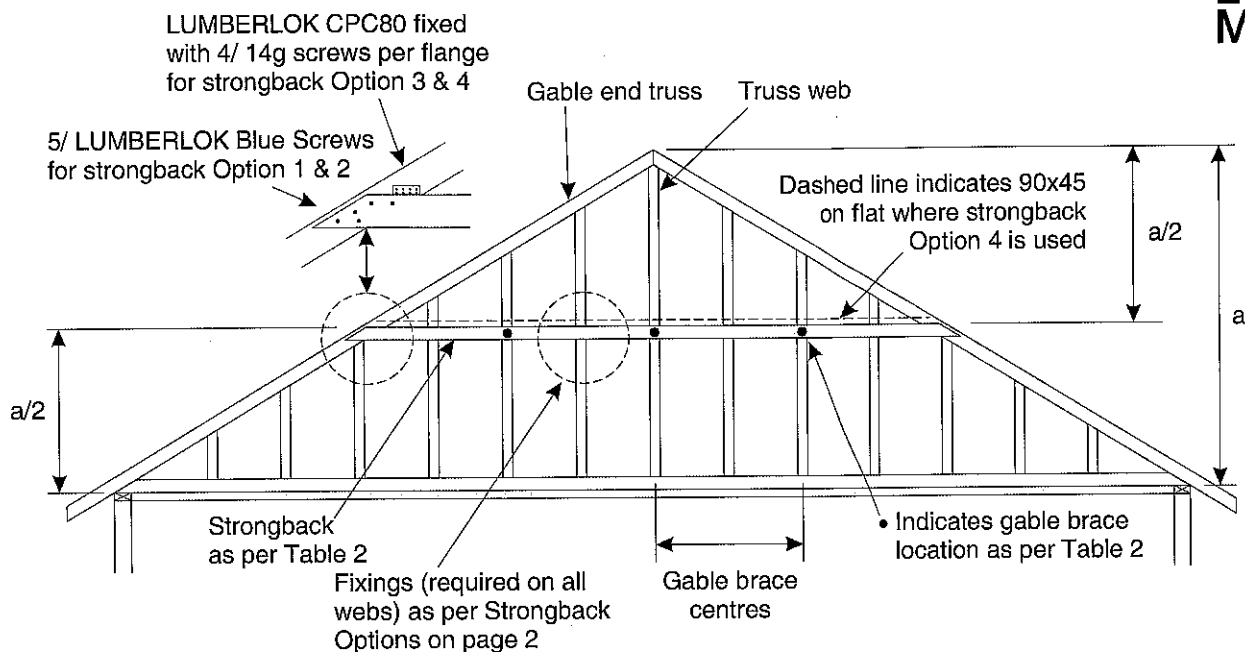
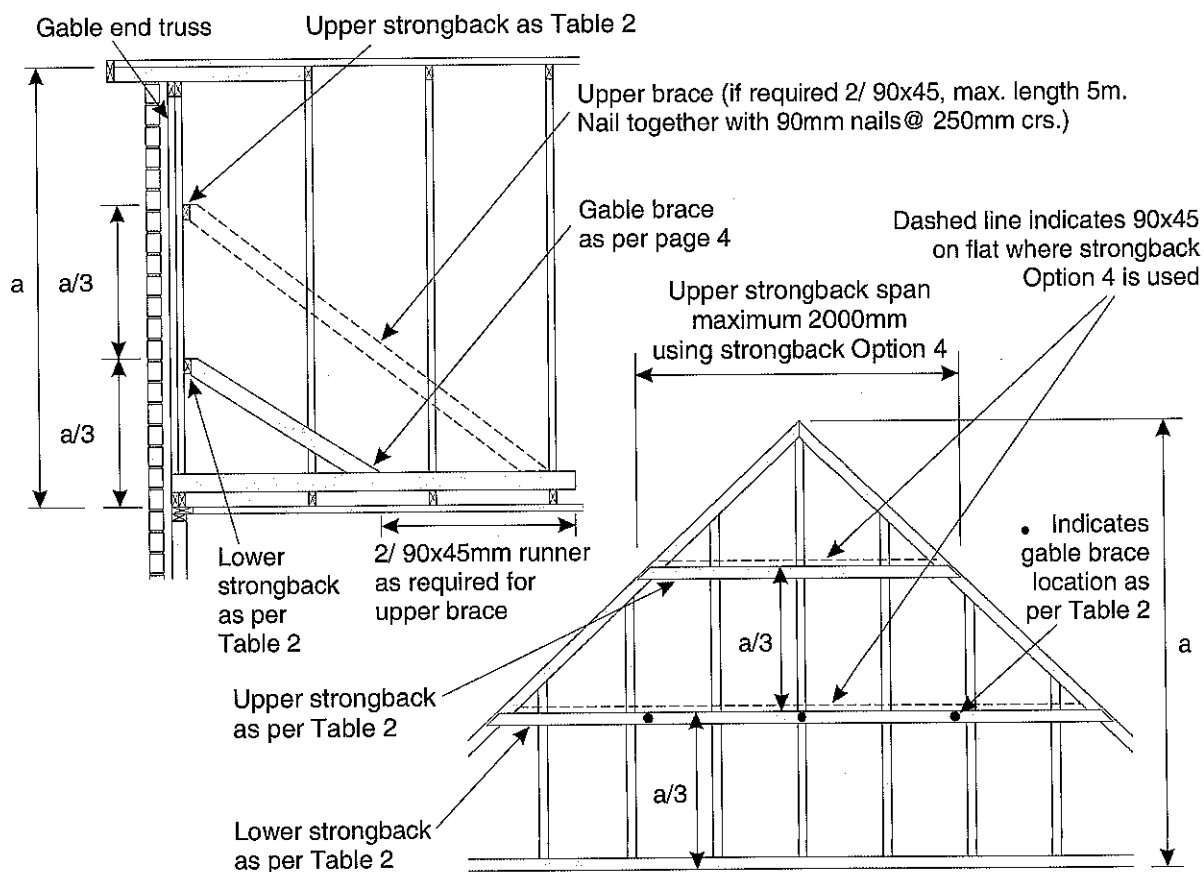


TABLE 2 - STRONGBACK SPAN AND GABLE BRACE LOCATION

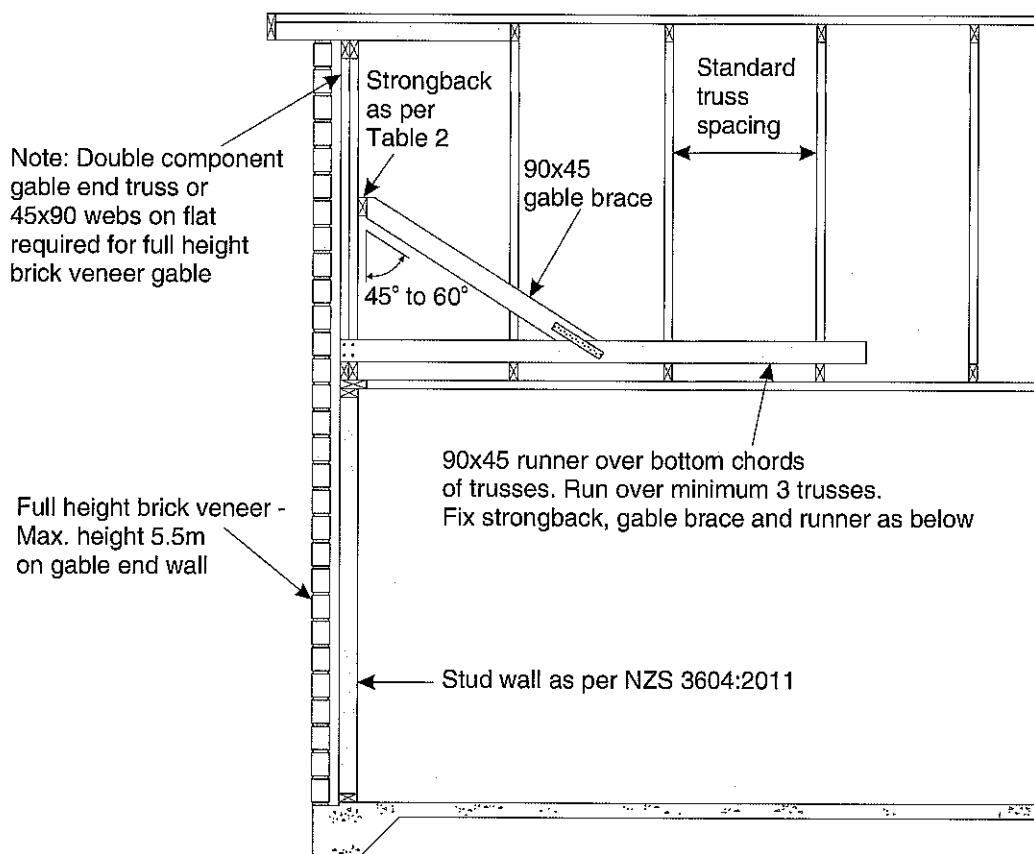
OPTION 1	OPTION 2	OPTION 3	OPTION 4
 90x45 on edge	 140x45 on edge	 90x45 on flat	 90x45 on flat plus 90x45 on edge
Max. span and/or gable brace location 1200mm	Max. span and/or gable brace location 1400mm	Max. span and/or gable brace location 1600mm	Max. span and/or gable brace location 2000mm



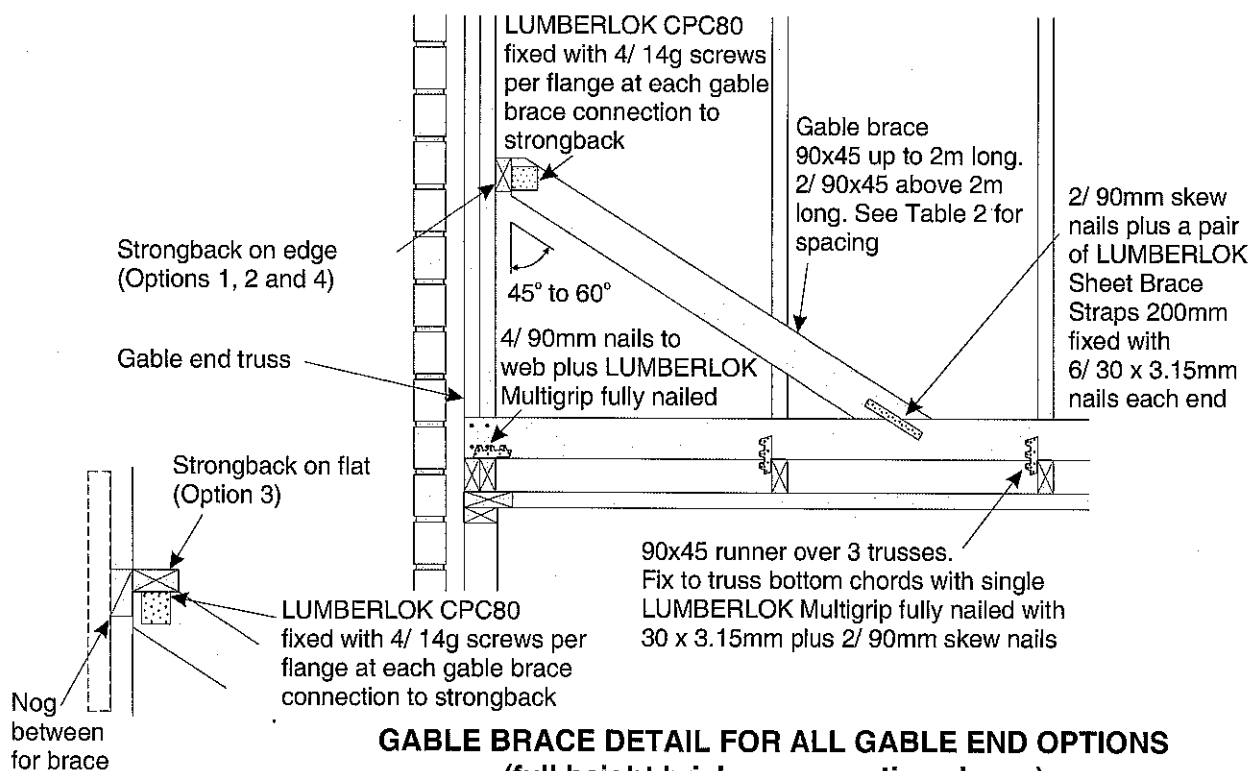
SINGLE STRONGBACK DETAILS



DOUBLE STRONGBACK DETAILS FOR ALL GABLE END OPTIONS (full height brick veneer option shown)



CROSS SECTION
(full height brick veneer option shown)



GABLE BRACE DETAIL FOR ALL GABLE END OPTIONS
(full height brick veneer option shown)

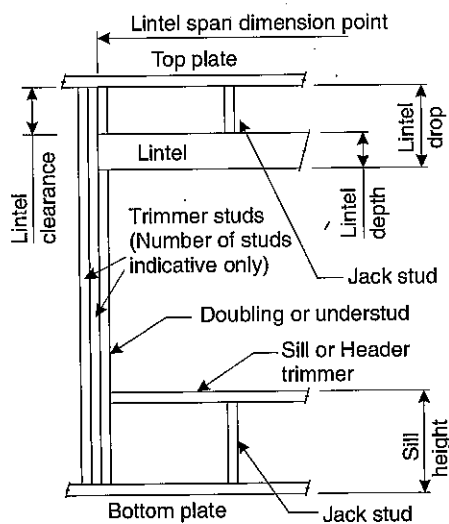


LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

NOTE:

- ☆ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ☆ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist horizontal loads.
- ☆ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ☆ All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ☆ Wall framing arrangements under girder trusses are not covered in this schedule.
- ☆ All timber selections are as per NZS 3604:2011.

DEFINITIONS



Lintel Supporting Girder Trusses:

Roof Tributary Area	Light Roof			Heavy Roof		
	Wind Zone			Wind Zone		
	L, M, H	VH	EH	L, M, H	VH	EH
8.6 m²	G	G	H	G	G	H
11.6 m²	G	H	H	G	G	H
12.1 m²	G	H	H	G	H	H
15.3 m²	H	H	-	G	H	H
19.1 m²	H	-	-	G	H	-
20.9 m²	H	-	-	H	H	-
21.8 m²	H	-	-	H	-	-
34.3 m²	-	-	-	H	-	-

Notes:

- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
- 2) Assumed girder truss is at mid-span or middle third span of lintel
- 3) Use similar fixings for both ends of lintel
- 4) All other cases require specific engineering design

SELECTION CHART FOR LINTEL FIXING

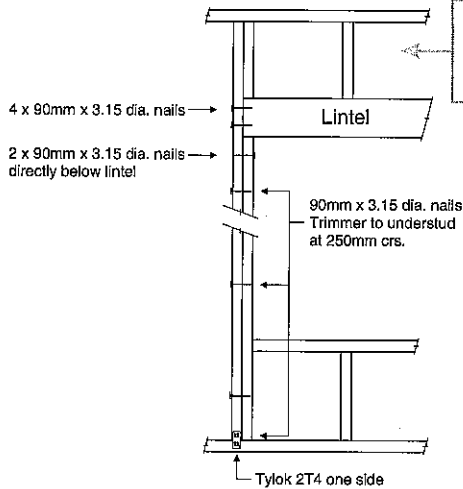
Lintel Span	Loaded Dimension (See Fig. 1.3 NZS 3604:2011)	Light Roof					Heavy Roof				
		Wind Zone					Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
0.7	2.0	E	E	E	E	F	E	E	E	E	E
	3.0	E	E	E	F	F	E	E	E	E	F
	4.0	E	E	F	F	F	E	E	F	F	F
	5.0	E	F	F	F	G	E	E	F	F	F
	6.0	E	F	F	G	G	E	E	F	F	G
0.9	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	E	F	F	F	E	E	F	F	F
	5.0	E	F	F	F	G	E	E	F	F	F
	6.0	E	F	F	G	G	E	E	F	F	G
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	F	F	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	H	E	E	F	F	G
1.5	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	F	F	G	G	H	E	E	F	F	G
	6.0	F	F	G	H	H	E	E	F	F	H
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	F	F	G	G	E	E	F	F	G
	4.0	F	F	G	G	H	E	E	F	F	G
	5.0	F	F	G	H	H	E	E	F	F	H
	6.0	F	G	G	H	H	E	F	G	H	H
2.4	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	F	G
	4.0	F	F	G	H	H	E	E	F	F	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	H	H	-	E	F	G	H	H
3.0	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	H	H	E	E	F	G	H
	4.0	F	G	G	H	H	E	F	G	H	H
	5.0	F	G	H	H	-	E	F	G	H	-
	6.0	F	G	H	-	-	E	F	G	H	-
3.6	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	F	G	H	H	E	F	G	G	H
	4.0	F	G	H	H	-	E	F	G	H	-
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	G	H	-
4.2	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	H	-	-	E	F	G	H	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.5	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	-
	3.4	F	G	H	-	-	E	F	G	H	-
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
4.8	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.2	F	G	H	H	-	E	F	G	H	-
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-

LINTEL FIXING OPTIONS



TYPE E

1.4 kN

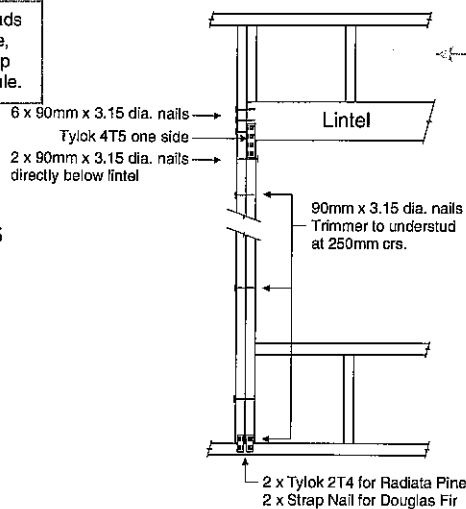


For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE F

4.0 kN

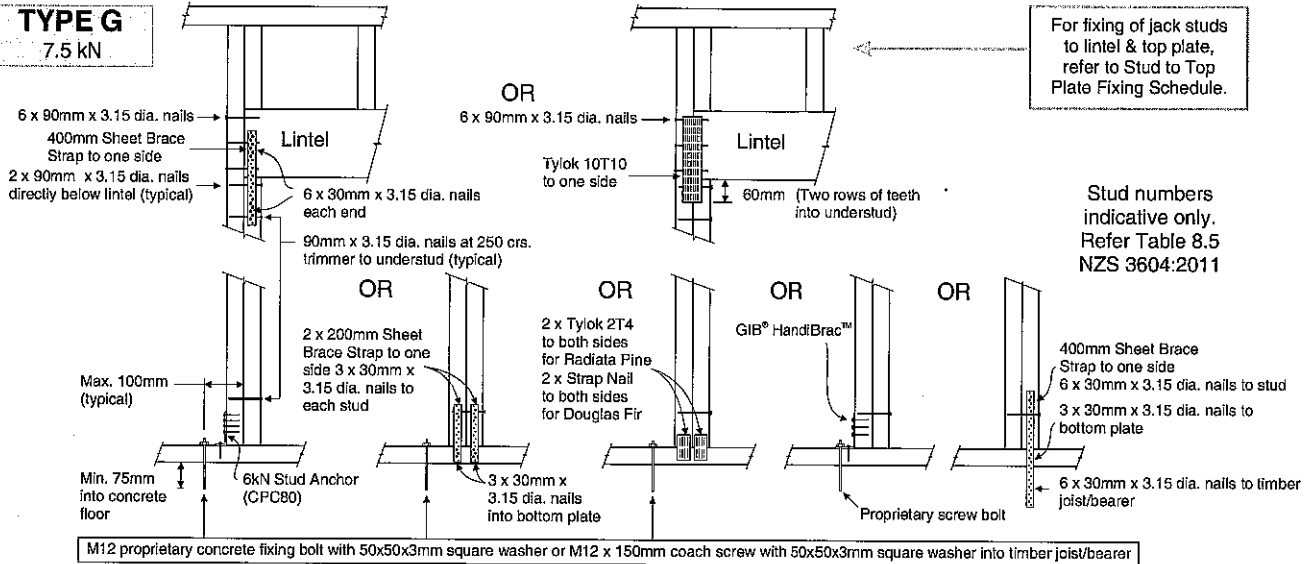


For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE G

7.5 kN

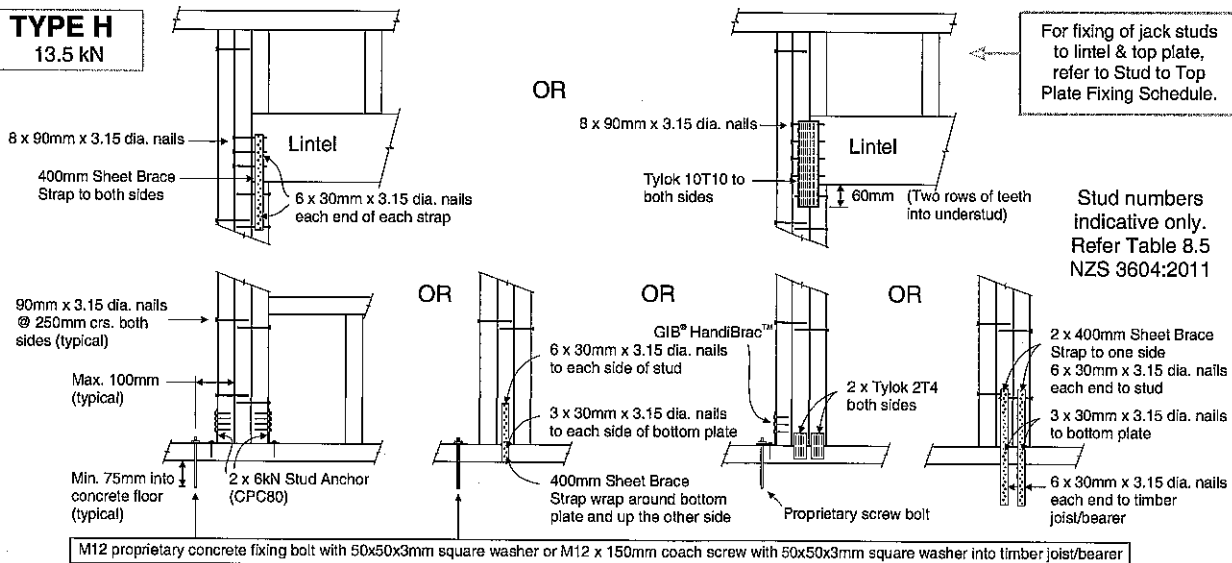


For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE H

13.5 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011



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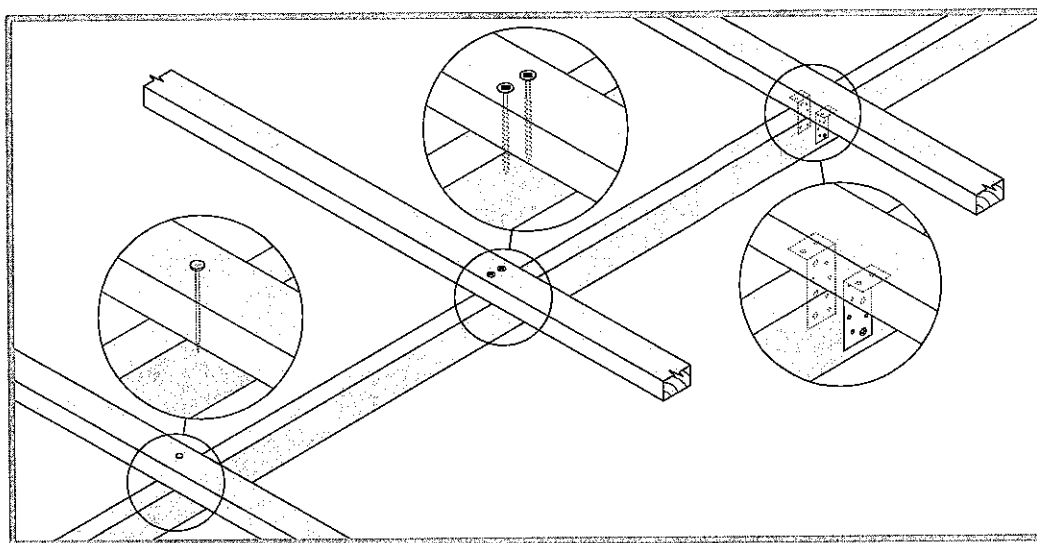
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PURLIN & BATTEN FIXING CHART ALTERNATIVE SOLUTION TO NZS 3604:2011 TABLES 10.10 & 10.12

NOTE:

- ☆ All purlin and batten sizes are as per NZS 3604:2011.
- ☆ All fixings assume that the purlin and battens are installed on their flat over the top of the rafter or truss.
- ☆ The minimum fixing requirements apply to all purlin locations within the roof area.
- ☆ The LUMBERLOK BLUE SCREW where specified requires a minimum of 30mm penetration into rafter or truss i.e. it is suitable for rough sawn timber up to 50mm thick at 18% moisture content.



SELECTION CHART FIXING OPTIONS (minimum fixing requirements)

ROOF WEIGHT	MAX. PURLIN SPAN (mm)	MAX. PURLIN CRS. (mm)	WIND ZONE				
			L	M	H	VH	EH
HEAVY ROOF Tile Battens	900	370	A	A	A	A	A
LIGHT ROOF Tile Battens	900	370	A	A	B	C	C
	1200	370	A	B	C	C	C
LIGHT ROOF Purlins	900	900	C	C	C	C	D
	1200	900	C	C	C	D	D
	1200	1200	C	C	D	E	E

Wind Zone:
As per NZS 3604:2011

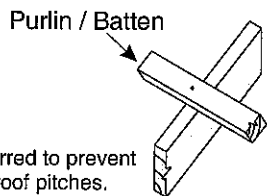
L = Low Wind
M = Medium Wind
H = High Wind
VH = Very High Wind
EH = Extra High Wind

STANDARD FIXING OPTIONS

FIXING TYPE A 0.55kN

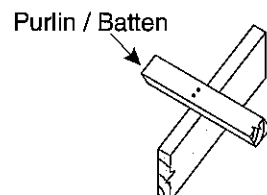
1 NAIL

Note: Two nails may be preferred to prevent batten rolling over with high roof pitches.



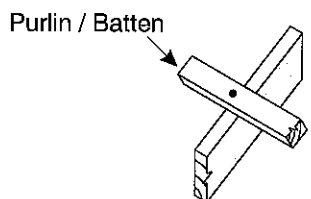
FIXING TYPE B 0.8kN

2 NAILS



FIXING TYPE C 2.4kN

1 BLUE SCREW

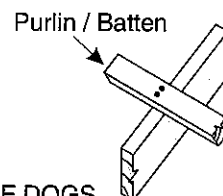


FIXING TYPE D 3.45kN

2 BLUE SCREWS

OR

2 SKEW NAILS plus 2 WIRE DOGS
(for purlin on edge)

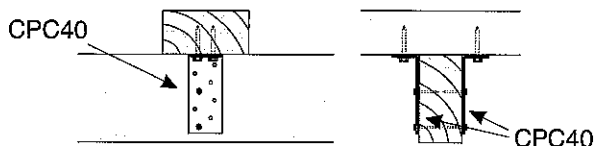


FIXING TYPE E 5.5kN

2 NAILS plus 1 CT200

OR

1 PAIR of CPC40



FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

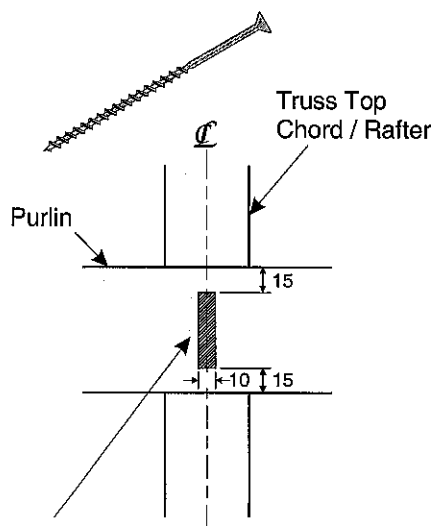
BLUE SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW

WIRE DOG = LUMBERLOK WIRE DOG either LH or RH

CT200 = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

CPC40 = LUMBERLOK CPC40 with 2 x Type 17-14g x 35mm Hex Head Screws per flange

FIXING TOLERANCES LUMBERLOK BLUE SCREW

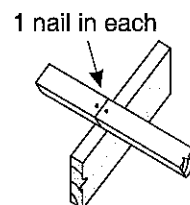


NOTE:

Locate fixings within the shaded area. Care to be taken to avoid over tightening of screws.

PURLIN / BATTEN SPLICE FIXING OPTIONS

FIXING TYPE A & B OVER PURLIN SPLICE

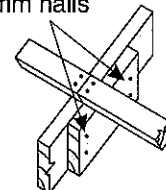


NOTE:

Skew nail when fixing to 35mm rafter or truss

FIXING TYPE C, D or E OVER PURLIN SPLICE

90 x 35mm block fixed to chord or rafter with 4 x 75mm nails



• TYPE C
1 SCREW
to each purlin

• TYPE D & E
1 NAIL plus 1 SCREW to each purlin



LUMBERLOK®

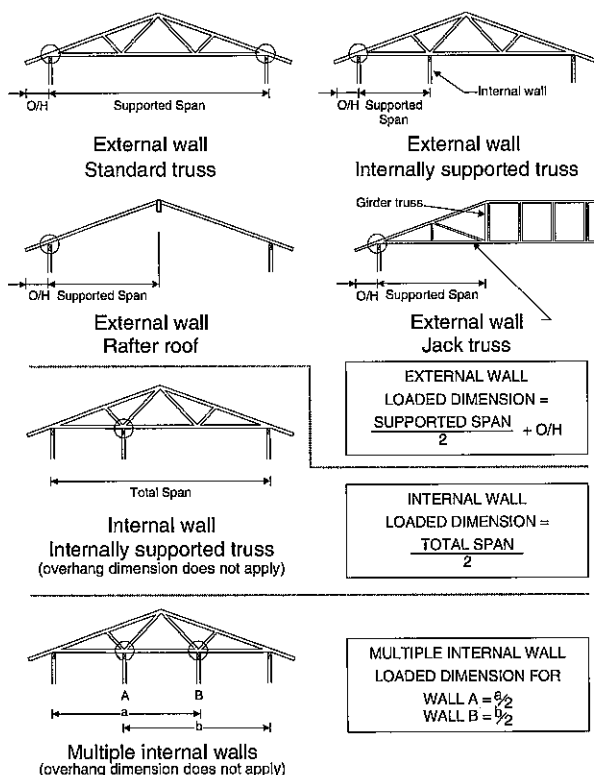
09/2011

STUD TO TOP PLATE FIXING SCHEDULE ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

NOTE:

- ☆ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ☆ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ☆ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ☆ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
- ☆ All fixings assume top plate thickness of 45mm maximum.
- ☆ Wall framing arrangements under girder trusses are not covered in this schedule.
- ☆ All timber selections are as per NZS 3604:2011.

LOADED DIMENSION DEFINITION



FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

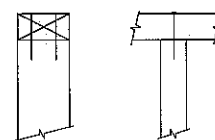
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	A	A	B	B	B	A	A	B	B	B
4.0	3.0	2.0	A	A	B	B	B	A	A	B	B	B
5.0	3.8	2.5	A	B	B	B	B	A	A	B	B	B
6.0	4.5	3.0	A	B	B	B	B	A	A	B	B	B
7.0	5.3	3.5	A	B	B	B	B	A	A	B	B	B
8.0	6.0	4.0	A	B	B	B	B	A	A	B	B	B
9.0	6.8	4.5	B	B	B	B	B	A	A	B	B	B
10.0	7.5	5.0	B	B	B	B	B	A	A	B	B	B
11.0	8.3	5.5	B	B	B	B	B	A	A	B	B	B
12.0	9.0	6.0	B	B	B	B	B	A	A	B	B	B

FIXING OPTIONS

FIXING TYPE A 0.7 kN

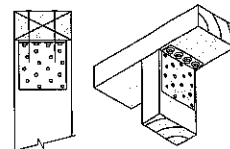
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



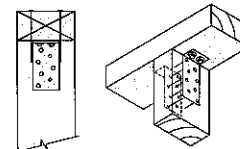
FIXING TYPE B 4.7 kN

CHOOSE ANY OF THE 3 OPTIONS BELOW

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.

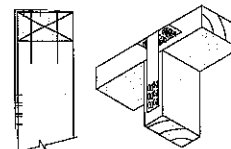

Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.


Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.


Plus
LUMBERLOK
Stud Strap
(one face only)

Note:

To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.



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APPENDIX 3 – Flexiseal installation details

Please find attached Flexiseal installation details.

FAQ...

What happens if the membrane is damaged prior to tile installation?

Do not attempt to repair it yourself. This would void any guarantee. Please call the licensed applicator who installed your system for them to make any repairs.

Are the products used in the "Flexi-Seal Waterproofing System" safe and non toxic?

Yes. Unlike some membrane systems utilising epoxies or flanglass etc the Flexi-Seal system contains no dangerous solvents or hydrocarbon. It is a water based system with very little odour.

Is the system expensive?

No. When you compare the "Flexi-Seal Licensed Waterproofing System" against other systems and the peace of mind that your shower or deck won't leak, it is very affordable.

What adhesives should we use when installing tiles onto "Flexi-Seal"?

As part of the BRANZ Appraisal, tile adhesive shear testing was conducted.

Your local licensed applicator for "Flexi-Seal" will recommend you use "Flexi Wall 'n' Floor 2 Part High Performance Adhesive" on all exterior applications and

interior areas waterproofed over wooden substrates. This will offer ultimate flexibility and exterior durability. On more stable interior substrates such as concrete and all other interior applications, "Flexi-Seal General Purpose Single Pack Adhesive" should be used. Your licensed applicator will advise where these two recommended adhesives can be purchased from. NB: Any alternative adhesives used beyond the recommendation may void the warranty.

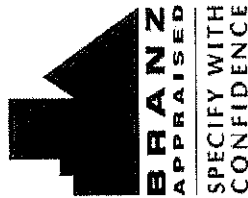
Why can't I use a One Pot dispersion adhesive?

This is not recommended on waterproofing or in wet areas. Dispersion adhesives rely on a water loss curing mechanism and are re-emulsifiable.

I have a concrete floor without polythene underneath, and moisture is coming up through it. Will Flexi-Seal stop this?

Yes. As with walls with hydrostatic water pressure problems, "Flexi-Seal Positive Pressure Coat" is used in conjunction with the standard "Flexi-Seal Waterproofing System".

For performance data please view specific data sheets relating to the products used in the "Flexi-Seal Licensed Waterproofing System".



**BRANZ
APPRAISED**
**SPECIFY WITH
CONFIDENCE**

BRANZ Appraisal Certificate 474 (2005)
Internal wet area membrane.

BRANZ Appraisal Certificate 475 (2005)
External waterproofing membrane.



When tiling onto the "Flexi-Seal Waterproofing Membrane", use "Flexi Wall 'n' Floor 2 Part High Performance Adhesive" for all exterior applications, and over interior wooden substrates. For all other interior applications use "Flexi-Seal General Purpose Single Pack Adhesive".

Flexi-Seal®
Licensed waterproofing system

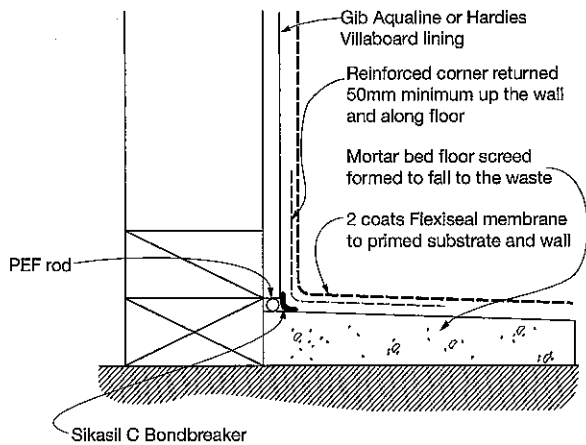


www.flexiseal.co.nz

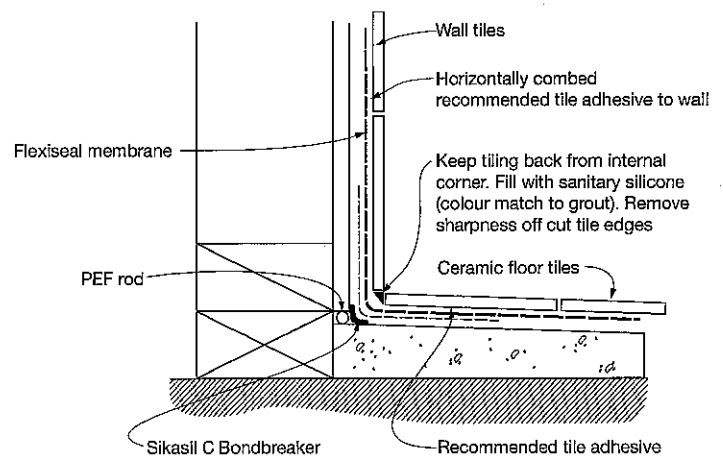
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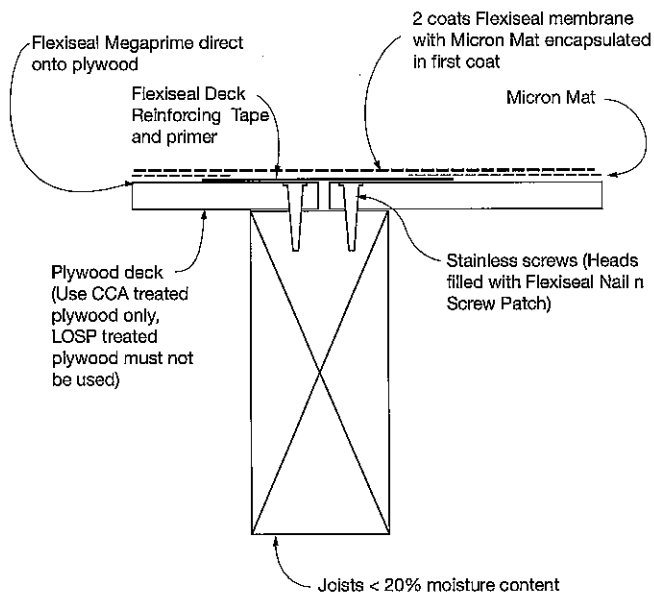
INSTALLING BACKER ROD BOND BREAKER & MEMBRANE



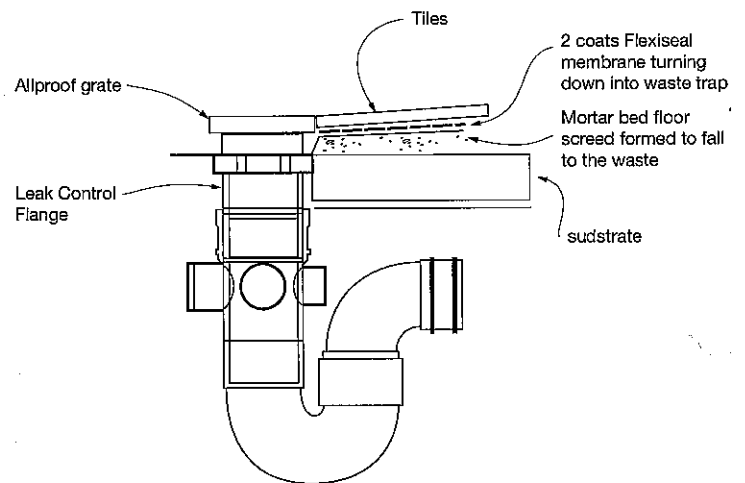
TILED FLOOR / WALL JUNCTION



PLYWOOD DECK JOINT DETAIL



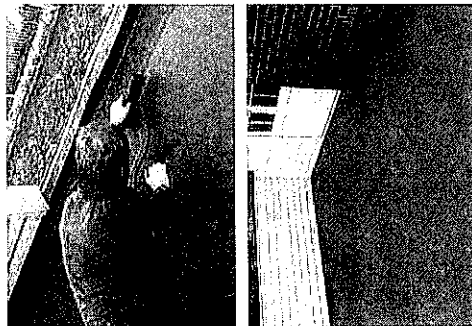
TYPICAL INSTALLATION OF WASTE TRAP



Introduction...

Waterproofing of showers, bathrooms, decks and balconies is an important process in the construction of any new building or renovation. It is even more important to waterproof them properly and with the correct products. Because the waterproofing process is basically "out of sight" it can also be "out of mind", and is often completed unsuitably and inappropriately by fitters and other tradesmen whose core business is anything but waterproofing. Failure to provide a complete waterproof seal under showers and decks can prove to be costly, and a source of great headache to building owners and developers.

The "Flexi-Seal Licensed Waterproofing System" says it all. It is a license applied 2 Part flexible waterproofing membrane, that provides an efficient and permanent water barrier, without compromising its integrity. Offering long term protection, the system provides a high degree of water resistance, and outstanding cohesive strength. The Flexi-Seal 2 part Liquid Membranes cohesive strength gives the ability to absorb considerable substrate movement, and bridge developing cracks. This is another important feature.



Application by your Flexi-Seal Licensed applicator

The first stage

begins with the licensed applicator inspecting the substrate and area to be waterproofed. The applicator will communicate any problems with the installation of the wall, floor or deck substrates back to the installer or builder, who must remedy the situation prior to the installation of "Flexi-Seal". Once satisfied, Stage 1 - "Substrate Installation" is signed off.

The second stage

comprises of the preparation and waterproofing process.

The "Flexi-Seal" system can be applied to most substrates, but generally, concrete, cement board, gib board, plywood and particle board are the common ones.

Step 1 requires the substrate to be clean, dry and free of any dust and contaminants. Substrates,

which are contaminated with moss lichen and mould, will first require treatment with

"O-go-Clean", organic moss and lichen control, followed by washing down or waterblasting.

Step 2 requires holes to be filled, particularly on plywood decks and particleboard floors. "Flexi-Seal Nail 'n' Screw" Patch is used for this process. Also at this stage galvanised heads on clouts etc are spot primed with "Flexi-Seal Mega Prime". This is a two part epoxy primer.

Step 3 requires the bondbreaker mechanism to be put in place. Floor/wall and wall/wall junctions are filled with a siliconised compound. Larger gaps may require a foam-backing rod to be installed first. These junctions are then reinforce taped with "Flexi-Seal Reinforcing Bandage".

Cracks in concrete floors are also reinforced. On decks, "Flexi-Seal Deck Joint Reinforcing Tape" is used.

Step 4 involves the application of a single saturation coat of Flexi-Seal Sealer / Primer on concrete, gib and cement board. This is applied to the entire area, paying attention to even coverage both to walls and floors. This is a milky white penetrative solution that will soak in and further

stabilise the substrate, leaving either an invisible or slightly low sheen clear coating on the surface. "Flexi-Seal Mega Prime" is used on plywood and particle board surfaces.

After approximately 1 hour cure, the waterproofing process can begin. This is a two coat process, and each coat is applied at a rate of approximately 1 litre per square metre.

The first coat cures to a very dark grey colour. The two part membrane is mixed proportionally by weight and then applied to all surfaces with care being taken to prevent unnecessary buildup at joints and junctions. On decks, "Flexi-Seal Micron Mat" is used to

prove micron thickness of the membrane. This is encapsulated within the first coat.

After approximately 45 - 60 minutes of drying/curing, the second coat can be applied.

The second coat is a lighter grey colour. This is a different colour to the first coat to ensure 100% proof of coverage. Once again attention is paid to unnecessary buildups and any pinholing which may have appeared in the first coat.

Curing of the finally installed membrane is important. The final system must be fully cured prior to the installation of tiles or other floor or wall coverings over the top. Allow 24 hours minimum. Longer cure times may be experienced in colder

temperatures or conditions with poor air circulation. Once cured and a check of the membrane is made, the licensed applicator will sign off stage two.

The third stage

Involves the applicator confirming the "Flexi-Seal Licensed Waterproofing System" is now ready for tile or floor/wall coverings. This is confirmed by a signature to the guarantee, and evidence of the "Flexi-Seal" approval and guarantee stencil on the site of installation.

NB: For walls and floors with hydrostatic water problems, "Flexi-Seal Positive Pressure Coat" is used, prior to application of "Flexi-Seal 2 Part Liquid Membrane".



Flexi-Seal Nail 'n' Screw Patch



Skafil C Bondbreaker



Flexi-Seal Mega Prime



Flexi-Seal Reinforcing Bandage



Flexi-Seal Sealer Primer



Flexi-Seal 2 Part Liquid Membrane



Flexi-Seal Guarantee Stencil

APPENDIX 4 – Bracing calculations

Please find attached bracing calculations.



Demand Calculation Sheet

Job Details

Name: Kromhout Addition
 Street and Number: 208 North Street, Te Awamutu
 Lot and DP Number: Lot 3 DP 25567
 City/Town/District: Te Awamutu
 Designer: Jason Kraayvanger
 Company: New Vision Architecture
 Date: 26-07-17

Building Specification

Number of Storeys: 1
 Floor Loading: 2 kPa
 Foundation Type: Subfloor
 Subfloor Cladding Weight: Light
 Cladding Weight: **Single** Light
 Roof Weight: Light
 Room in Roof Space: No
 Roof Pitch (degrees): 20
 Roof Height above Eaves (m): 1.76
 Building Height to Apex (m): 4.3
 Ground to Lower Floor (m): 0.6
 Average Stud Height (m): 2.7
 Building Length (m): 7.36
 Building Width (m): 5.8
 Building Plan Area (m²): 39.29

Building Location

Wind Zone = Medium

Earthquake Zone 1

Soil Type

D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (NZS3604:2011 Default)

Bracing Units required for Wind

	Along	Across
Single Level	170	185
Subfloor Level	309	320

Bracing Units required for Earthquake

	Along & Across
Single Level	193
Subfloor Level	260

Single Level Along Resistance Sheet

Job Name: Kromhout Addition

Timber Floor Limit of 120 BUs/m Applied

									Wind	EQ
									Demand	
									170	193
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	562 331%	494 256%
a	1	0.74		2.7	GS1-N	GIB®	39	39		
	2	2.61		2.7	GS1-N	GIB®	160	139		
	External Length = 7.36								199 OK	178 OK
b	1	5.26		2.0	GS1-N	GIB®	363	316		
	External Length = 7.36								363 OK	316 OK

Single Level Across Resistance Sheet

Job Name: Kromhout Addition

Timber Floor Limit of 120 BUs/m Applied

									Wind	EQ
									Demand	
									185	193
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	436 236%	379 196%
m	1	1.30		2.7	GS1-N	GIB®	80	69		
	2	1.63		2	GS1-N	GIB®	112	98		
	External Length = 5.3								192 OK	167 OK
n	1	1.68		2	GS1-N	GIB®	116	101		
	External Length = 5.3								116 OK	101 OK
o	1	1.20		2.7	BL1-H	GIB®	128	111		
	External Length = 3.85								128 OK	111 OK



Subfloor Level Along Resistance Sheet

Job Name: Kromhout Addition

									Wind	EQ
									Demand	
									309	260
									Achieved	
Line	Element	Length (m)	Angle (degrees)		Type	Supplier	Wind (BUs)	EQ (BUs)	960 311%	720 277%
A	1	1.00			Anchor Pile	NZS3604	160	120		
	2	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 7.36								320 OK	240 OK
B	1	1.00			Anchor Pile	NZS3604	160	120		
	2	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 7.36								320 OK	240 OK
C	1	1.00			Anchor Pile	NZS3604	160	120		
	2	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 7.36								320 OK	240 OK

Subfloor Level Across Resistance Sheet

Job Name: Kromhout Addition

									Wind	EQ
									Demand	
									320	260
									Achieved	
Line	Element	Length (m)	Angle (degrees)		Type	Supplier	Wind (BUs)	EQ (BUs)	800 250%	600 231%
M	1	1.00			Anchor Pile	NZS3604	160	120		
	1	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 5.8								320 OK	240 OK
N	1	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 5.8								160 OK	120 OK
O	1	1.00			Anchor Pile	NZS3604	160	120		
	2	1.00			Anchor Pile	NZS3604	160	120		
	External Length = 5.8								320 OK	240 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Hardies	JHDn 1.2	1.2	118	102
Hardies	JHD 0.4	0.4	83	107
Hardies	JHD 0.6	0.6	99	107
Hardies	JHD 1.2-2.4	1.2	150	140
Hardies	JHD 2.4	2.4	135	140
Hardies	JHDgn0.4	0.4	69	64
Hardies	JHDgn 1.2	1.2	86	72
Hardies				
ecoply	ep1			
ecoply	EPG 0.4	0.4	100	115

Custom Subfloor Elements

Supplier	System	Min. Length m	Wind BUs or BUs/m	EQ BUs or BUs/m

APPENDIX 5 – H1 calculations

Please find attached H1 calculations.

NV17048 - Kromhout additions

Total wall area: 71.06
Floor & Roof Area: 39.32
Area of Glazing 6.7
% Glazing/Wall area: 9.43%
Wall area: 64.36

Glazing over 30% NO

Climate Zone: 2

REFERENCE BUILDING

$$\text{HL reference} = \frac{\text{A roof}}{\text{R roof}} + \frac{70\% \text{ of total Wall area}}{\text{R wall}} + \frac{\text{A Floor}}{\text{R Floor}} + \frac{\text{A 30\% of total Wall Area}}{\text{R Glazing}}$$

$$\text{HL reference} = \frac{39.32}{2.9} + \frac{49.742}{1.9} + \frac{39.32}{1.3} + \frac{21.318}{0.26}$$

$$\text{HL reference} = 13.6 + 26.2 + 30.2 + 82.0$$

$$= \boxed{152.0}$$

Required less than

PROPOSED BUILDING

$$\text{HL proposed} = \frac{\text{A roof}}{\text{R roof}} + \frac{\text{A wall}}{\text{R wall}} + \frac{\text{A Floor}}{\text{R Floor}} + \frac{\text{A Glazing}}{\text{R Glazing}}$$

$$\text{HL proposed} = \frac{39.32}{2.99} + \frac{64.36}{2.04} + \frac{39.32}{1.48} + \frac{6.7}{0.26}$$

$$\text{HL proposed} = 13.2 + 31.5 + 26.6 + 25.8 =$$

$$\boxed{97.0}$$

Achieved

Reference Building Heat loss = 152.0

Proposed Building Heat loss = 97.0

PASS

Note: Double Glazing is required

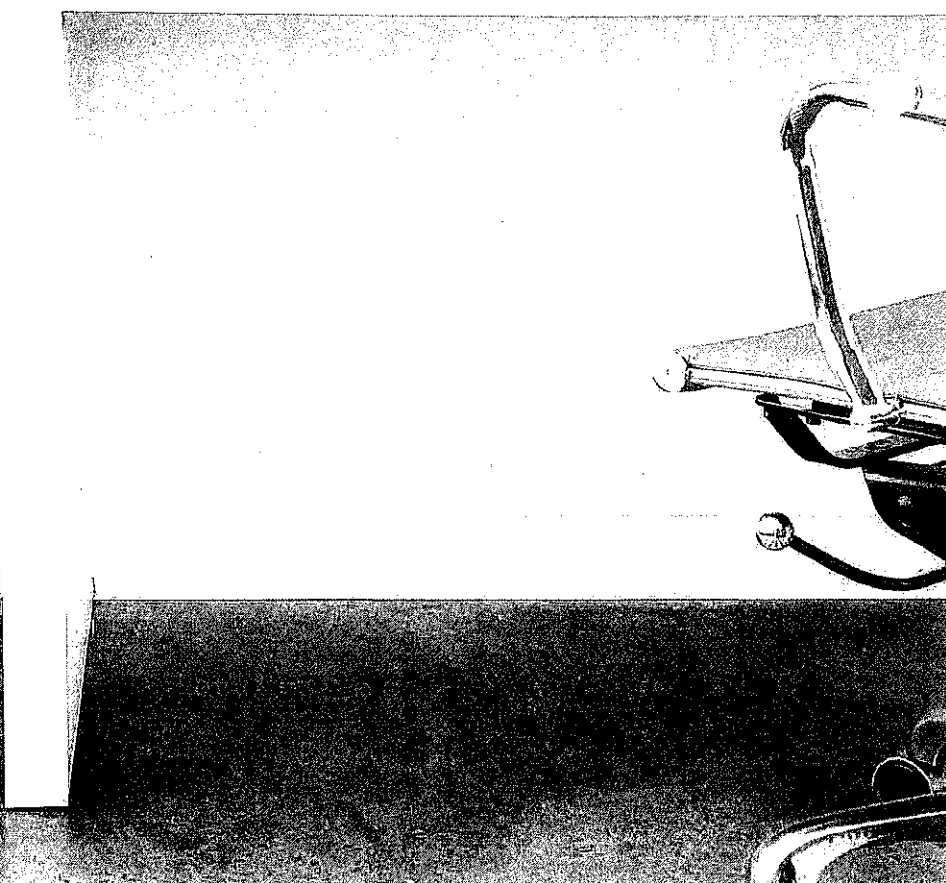
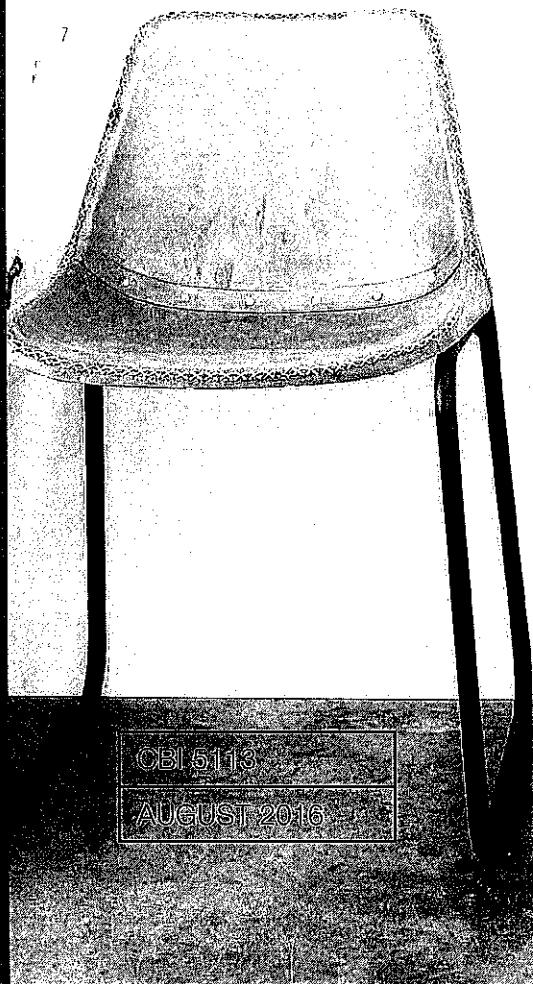
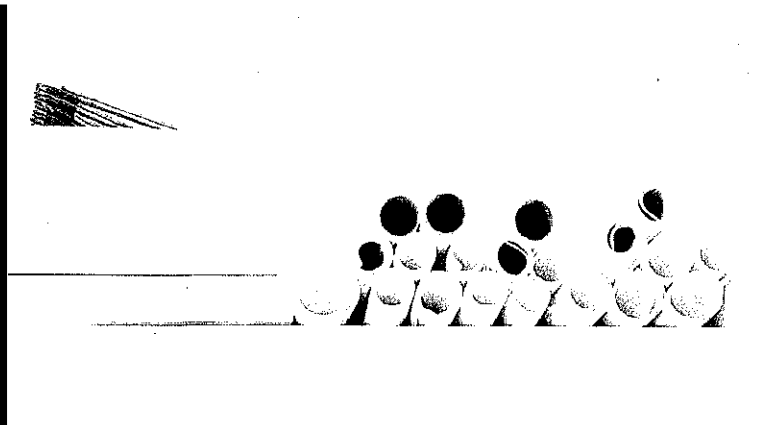
APPENDIX 6 – Gib Plaster board Bracing Manual

Please find attached Gib Plaster board Bracing Manual



EzyBrace[®] Systems

Specification and installation manual



CBI 5113
AUGUST 2016

CONTENTS

System Summary	5
GIB EzyBrace® Systems — August 2016	5
GIB® Plasterboard Substitution Table	5
Introduction	6
Scope of Use	6
Finish Quality — Framing and Substrates	6
New GIBFix® Framing Systems	6
New GS2-NOM Bracing Element	6
Compliance with the NZ Building Code	7
CAD Design Detail	7
Appraisal	7
Bracing Resistance and Demand	8
Bracing Resistance	8
Bracing Demand	9
Software Functionality	10
Design and Construction	12
GIB® Plasterboard Linings	12
GIB EzyBrace® Systems in Water-Splash Areas	12
Renovation	12
Openings in Bracing Elements	12
Timber Framing	13
GIBFix® Framing System (Alternative Layout)	13
Guidelines for Intersection Walls	13
Top Plate Connections	14
Parapets and Gable End Walls	14
Bottom Plate Fixing	14
Bracing Strap Installation	15
GIB HandiBrac® Installation	16
GIB HandiBrac® Placement with GIBFix® Framing	17
System Layout	18
Ceiling Diaphragms	19
Ceiling Battens in Ceiling Diaphragms	20
Openings in Ceiling Diaphragms	21
Length of GIB EzyBrace® Elements ('N' Type)	22
Length of GIB EzyBrace® Elements ('H' Type)	22
System Specifications	23
GIB EzyBrace® Systems Specification — GS1-N	23
GIB EzyBrace® Systems Specification — GS2-NOM	24
GS2-NOM Adhesive Fixing Option at Door Jambs	25
GIB EzyBrace® Systems Specification — GS2-N	26
GIB EzyBrace® Systems Specification — GSP-H	27
GIB EzyBrace® Systems Specification — BL1-H	28
GIB EzyBrace® Systems Specification — BLG-H	29
GIB EzyBrace® Systems Specification — BLP-H	30
Sustainability and the Environment	31



GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until further notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultralite®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyrelite®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.

Note 2 The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.

Note 3 Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.

Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

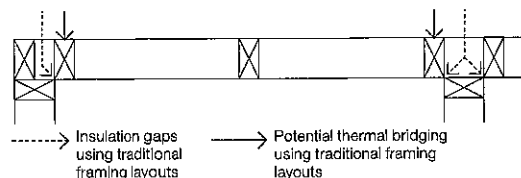
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

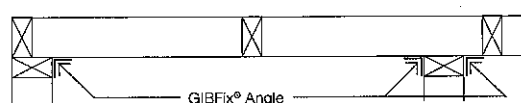
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GF8004

FIGURE 2: GIBFix® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GF8005

NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners!
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 – STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 – DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 – HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 – ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

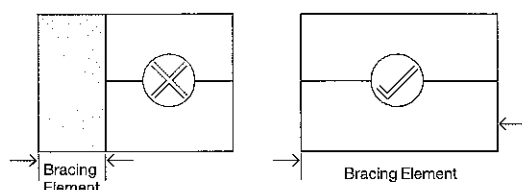
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

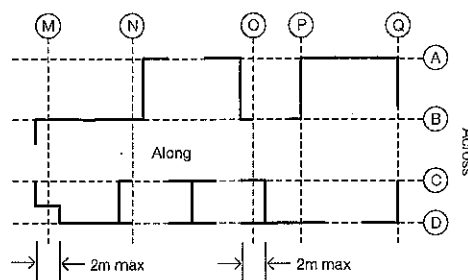
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 'rules' are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- 'N' stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15-16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)

Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

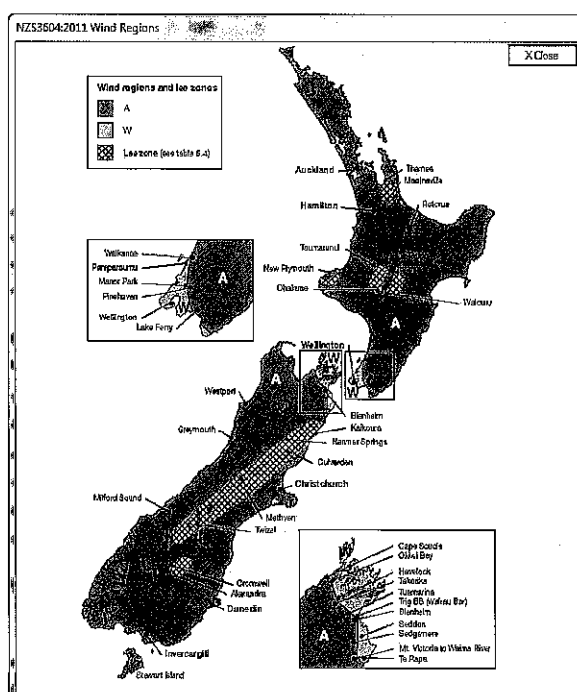
Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 – DEMAND CALCULATION SHEET AND ‘POP UP’ HELP FACILITY

GIB EzyBrace® Bracing Software			
Job Details			
Name:	A-AB		
Owner and Address:	888 Job Street Lot 121, DP #50		
Client/Estimator:	Jedwards		
Designer:	AR Christ		
Company:	Jobs United		
Date:	10/01/11		
Building Specification			
Number of Storeys:	Single		
Floor Loading:	2 kPa		
Foundation Type:	Slab		
Single			
Casting Height:	1	Storey	
Roof Weight:	2	kPa	
Name in Wind Space:	Rite		
Roof Pitch:	7	25	
Roof height above eaves (m)	1.5		
Holding height to apex (m)	1.5		
Distance to lower floor(s)	0.0		
Gird Height (m)	2.4		
Bushing Length (m)	10		
Bushing Width (mm)	100		
Bushing Area (mm ²)	100		
Building Location			
Wind Zone - Low	☒ Earthquake Zone	1	
Wind Zone or Consent Authority	Not Available	Sid type	D & F (Depository Sid)
Wind Region	A	Annual Prob. of Exceedance	1 in 500 (4034641 2011 Outlook)
Lee Zone	Rite		
Ground Roughness	Urban		
Site Exposure	Exposed		
Topography Class	Flat		
Bracing Units required for Wind		Bracing Units required for Earthquake	
	Along	Across	Along and Across
Single Level	258	322	Single 264

Options: [Single Along] [Single Across] [Custom]



 Download GIB EzyBrace® 2016 design software
from gib.co.nz/ezybrace



Software functionality

Innovations adopted in the GIB EzyBrace® 2016 bracing 'resistance' calculation sheets include the ability to easily add and delete lines and elements during calculations.

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum

bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

Figures 6 and 7 show screen shots of the Wall and Subfloor Resistance Sheets respectively.

FIGURE 6: GIB EZYBRACE® 2016 — WALL BRACING RESISTANCE CALCULATION SHEET

Line	Ext. Len. (m)	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BU)	Earthquake (BU)	Wind Demand	Earthquake Demand
a	11.25	1	0.6		2.44	GSP-H	GIB®	53	58	1499	1492
		2	1.1		2.44	GSP-H	GIB®	72	65		
		3	0.6		2.44	GSP-H	GIB®	67	73		
b	6.41	1	1.2		2.44	GSP-H	GIB®	81	71	193 OK	196 OK
		2	0.6		2.44	GSP-H	GIB®	34	35		
		3	4		2.44	GSP-H	GIB®	197	197		
c		1	3.2		2.44	GSP-H	GIB®	157	157	157 OK	157 OK
d		1	7.9		2.44	GSP-H	GIB®	389	389	389 OK	389 OK
e	17.9	1	0.6		2.44	BL1-H	GIB®	58	60	449 OK	449 OK
		2	0.6		2.44	BL1-H	GIB®	59	60		
		3	0.8		2.44	BL1-H	GIB®	48	46		
		4	2.1		2.44	BL1-H	GIB®	143	124		
		5	1.2		2.44	EP1-1.2	CHH	142	159		

FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Line	Ext. Len. (m)	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind (BU)	Earthquake (BU)	Wind Demand	Earthquake Demand
A		1	1		Braced Piles	NZS3604	160	120	1100	780
		2	1		Anchor Pile	NZS3604	160	120		
		3	1		Braced Piles	NZS3604	160	120		
B		1	1		Braced Piles	NZS3604	160	120	426	697
		2	1		Cantilever Pile	NZS3604	70	30		
		3	1		Cantilever Pile	NZS3604	70	30		
C		1	1		Anchor Pile	NZS3604	160	120	360 OK	180 OK
		2	1		Anchor Pile	NZS3604	160	120		



Software functionality

Custom elements can be entered by accessing the 'custom' tab as shown in figure 8.

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET

Supplier	System	Min. Length	Wind Blasts	EQ Blasts	Element Height	Element Formulation	Element Formulation
Custom1	CU1-0.4	0.4	80	95	20	20	20
Custom1	CU1-0.6	0.6	95	105	20	20	20
Custom1	CU1-1.2	1.2	120	135	20	20	20
Custom2	CU2-0.4	0.4	90	95	20	20	20
Custom2	CU2-0.6	0.6	120	135	20	20	20
Custom2	CU2-1.2	1.2	164	135	20	20	20
Engineer	Porta1	1	300	300	20	20	20

Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

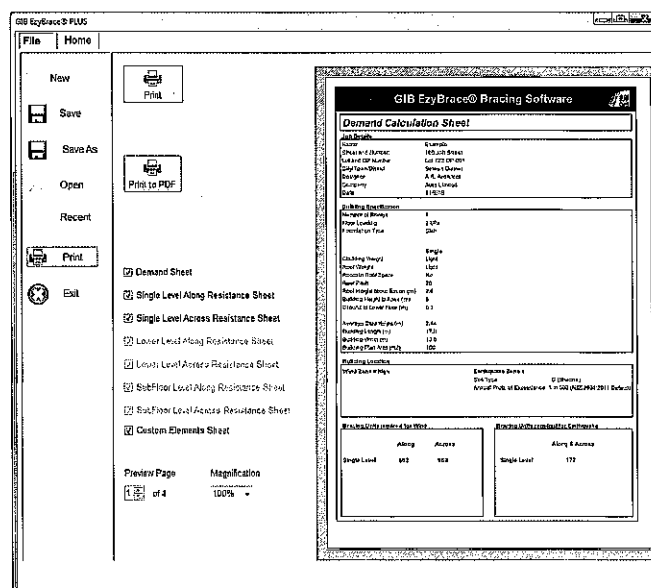
Help can be accessed by pressing the ? symbol which displays a window with further information.

The GIB EzyBrace® 2016 software has a number of options that can be accessed via the File tab at the top left hand corner of the window. The options include: New, Save, Save As, Open, Recent and Print.

- The New option closes any opened job ready for the input of a new job.
- The Save option saves the currently opened job to the same filename and the Save As option saves the job to a new filename.
- The Open option prompts for the name of an existing job.
- The Recent option displays a list of the ten latest jobs and allows for the selection of one of these jobs to be opened.
- The Print option displays the print screen. In this screen, a print preview is displayed. The print preview can be copied to the clipboard by clicking the right-hand mouse button. Also on the print screen is the option to choose which pages are to be printed and the option to print the output to a portable data format, PDF, file.
- The Print Screen View is shown in figure 9.

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace



GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For further design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

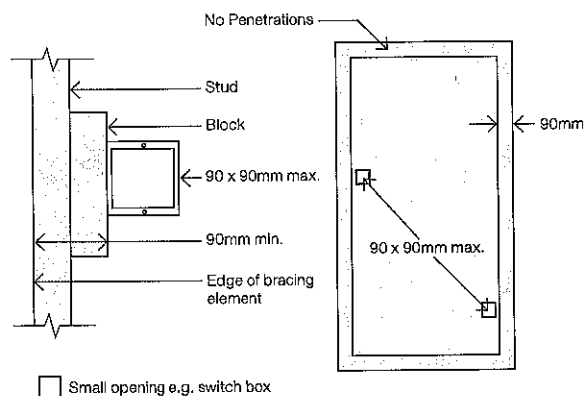
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

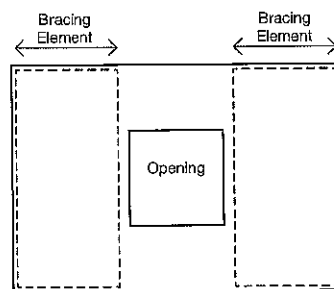
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

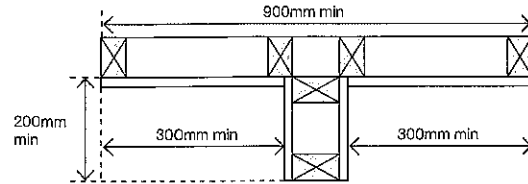
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

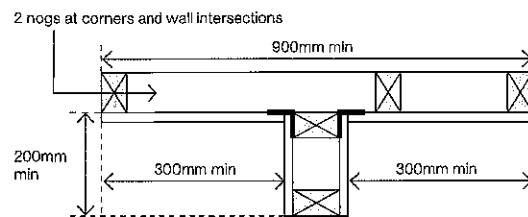
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



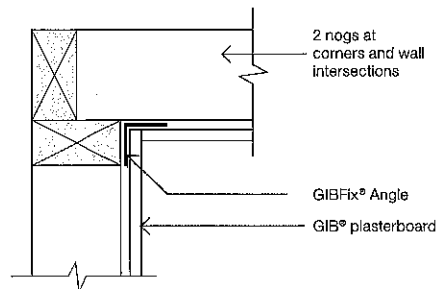
GEB002

FIGURE 13: WALL INTERSECTION (GIBFix® FRAMING SYSTEM)



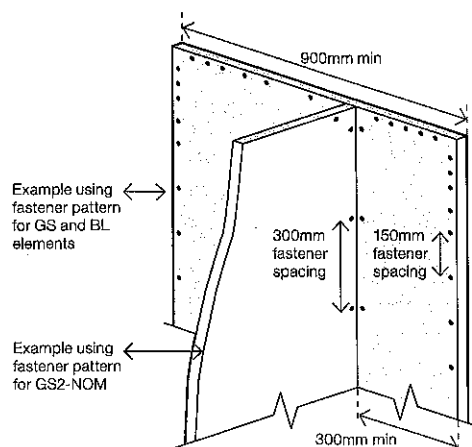
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFix® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

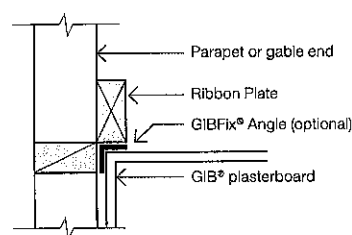
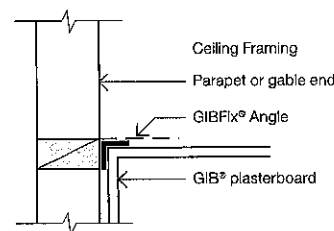


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

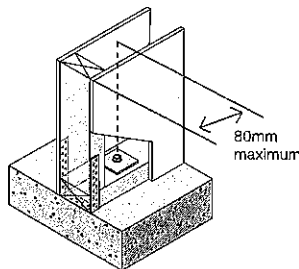
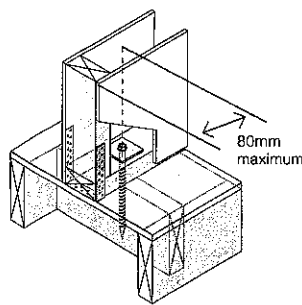
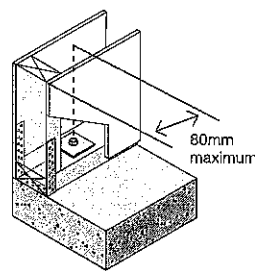
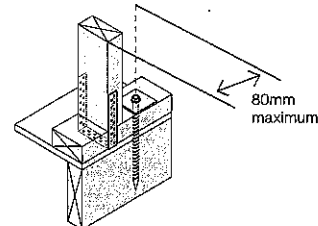
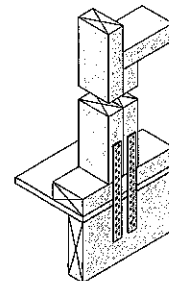
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and

positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

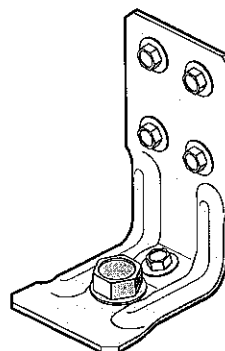
Concrete floor		Timber floor	
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.			
Internal wall			
			
GEB004		GEB005	
External wall			
			
GEB006		GEB007	
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library .		2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.	
			
		GEB008	
Hold-down fastener requirements			
Concrete floor		Timber floor	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.		12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element	

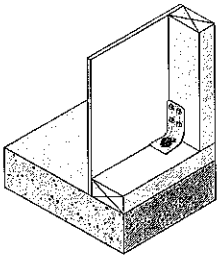
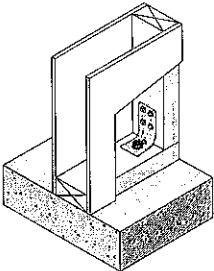
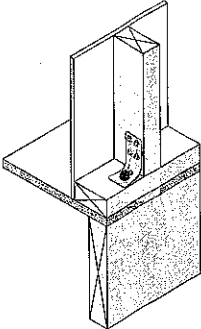
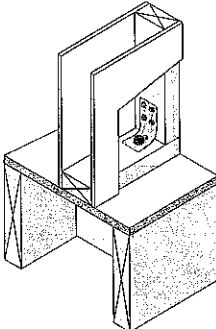
GIB HandiBrac® installation

Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.



Concrete floor		Timber floor	
External walls	Internal walls	External walls	Internal walls
			
GEB009 Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	GEB010 Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	GEB011 Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	GEB012 Position GIB HandiBrac® in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.	

GIB HandiBrac® placement with GIBFix® Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac® panel hold-down brackets within the GIBFix® Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac® can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

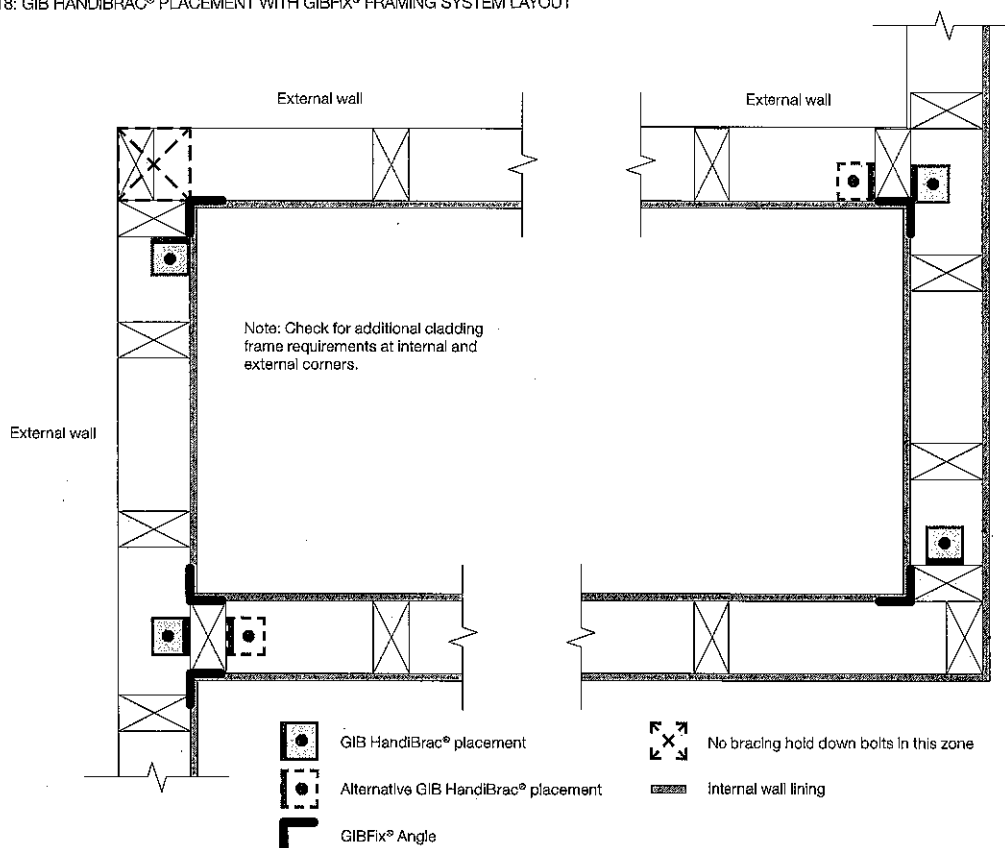
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

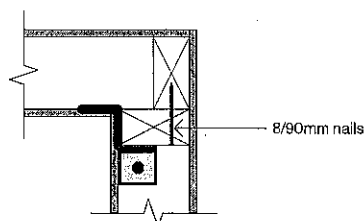
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC® PLACEMENT WITH GIBFIX® FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, "GIB® Site Guide". All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see "GIB® Site Guide").
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see "GIB® Site Guide" and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

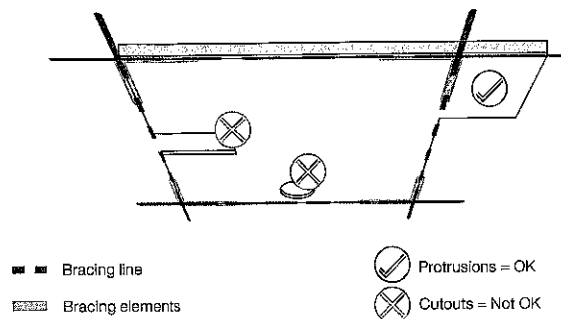


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

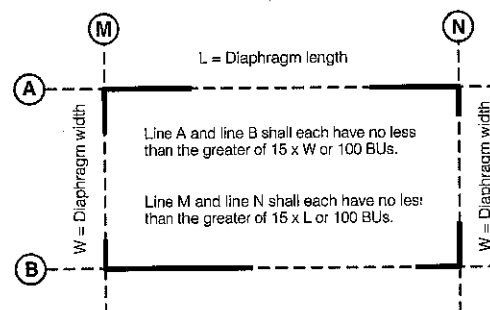
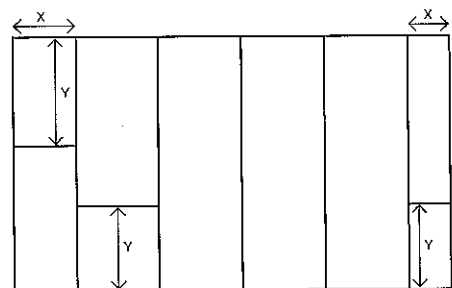
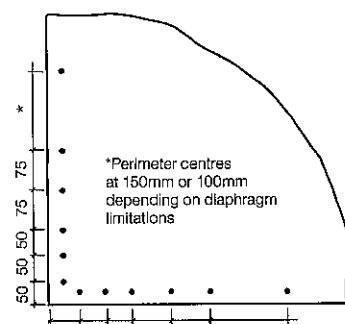


FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600-900mm; Y = 1800mm min sheet lengths min provided all adjacent joints at ends of ceiling diaphragms are back-blocked.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

Ceiling battens in ceiling diaphragms

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:

- 500mm for 10mm GIB® plasterboard,
- 600mm for 13mm GIB® plasterboard.

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

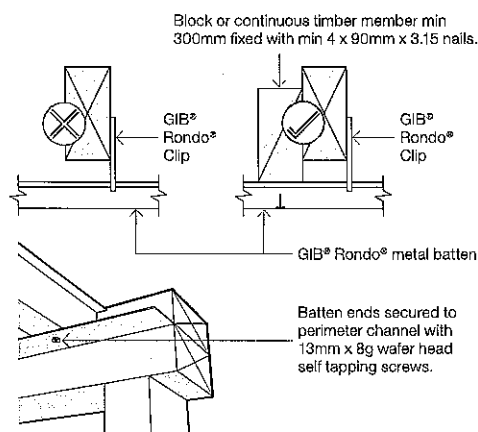
For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:

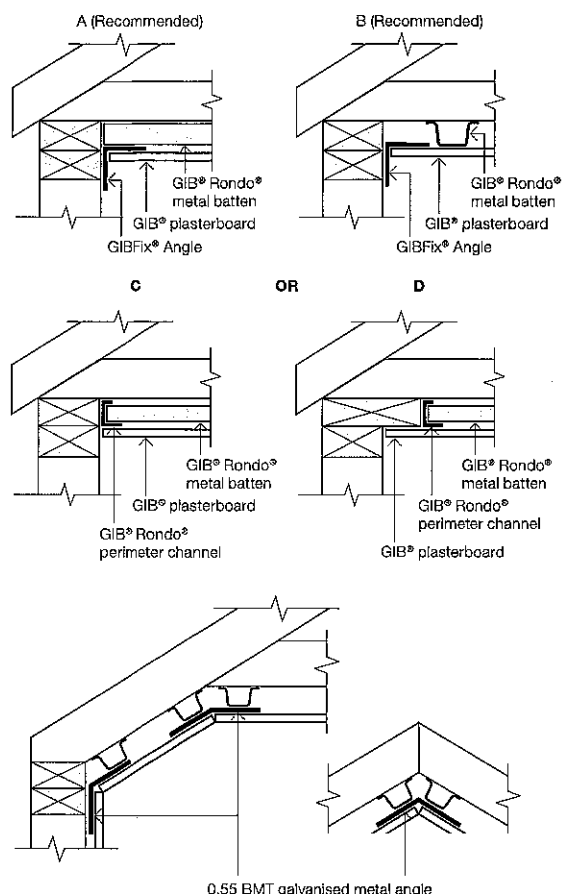
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



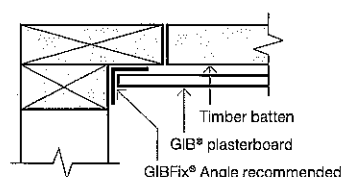
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed within the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvanised metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

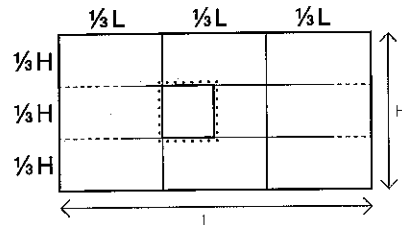
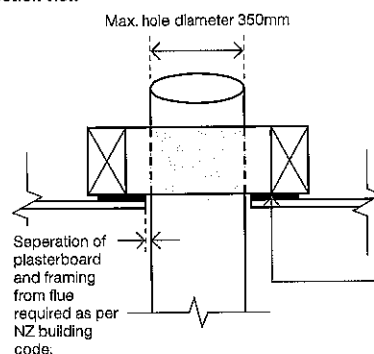
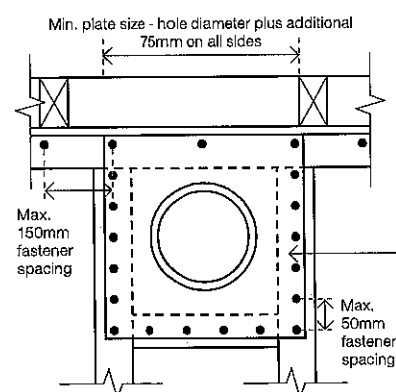


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Plasterboard ceiling not shown in plan view

Steel plate
0.55 BMT
Galvanised sheet
Max. opening
350mm diameter.
Installed prior to
GIB® plasterboard.

Framing
90 x 45mm framing
trimmed to provide
extra fixing.

GIB® plasterboard ceiling
Installed over the
steel plate and into
framing using a
minimum of 32mm
x 6g GIB® Grabber
High Thread or
32mm x 7g GIB®
Grabber Dual Thread
screws at 50mm
max centre spacing.

Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

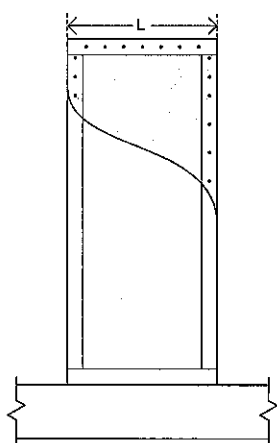
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

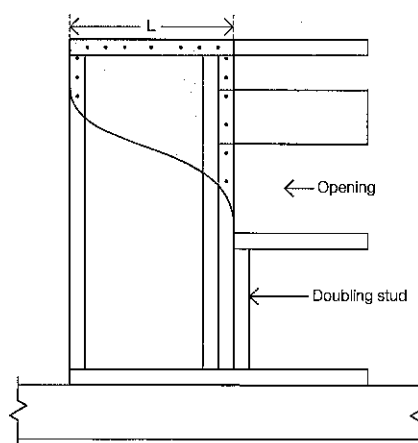
Fastener spacings and diagram scales shown in Figures 29-32 are indicative only. Refer to p.23-30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



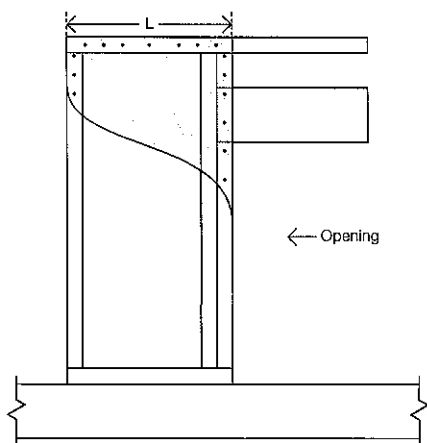
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



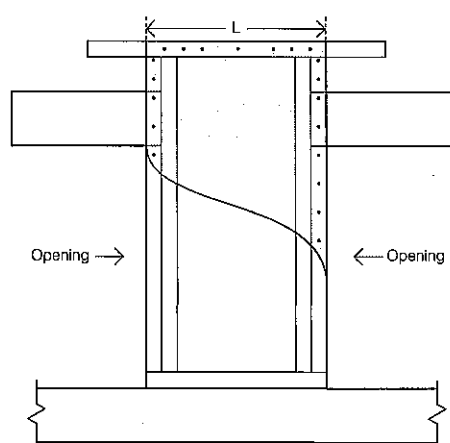
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

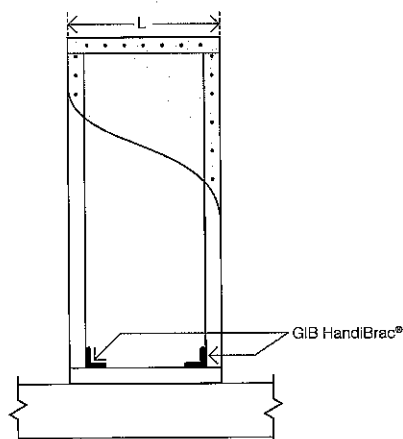
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34–36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB HandiBrac® below, and install the adjacent anchor bolt in the same position as the GIB HandiBrac® bolt.

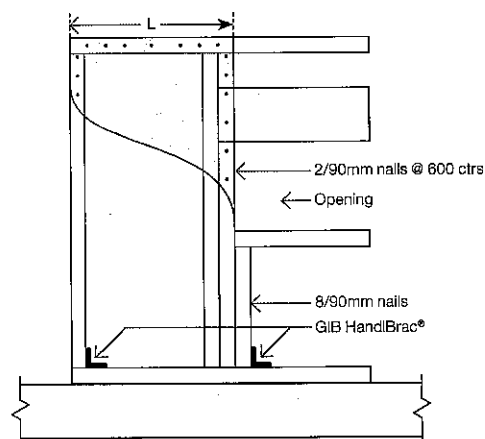
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



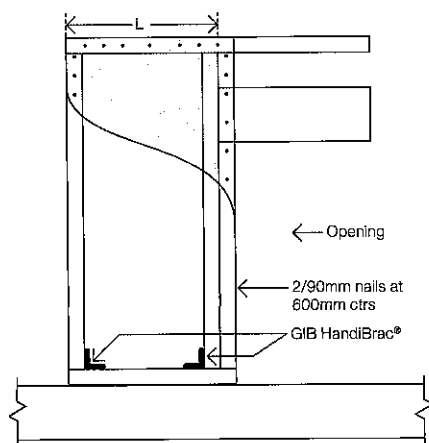
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



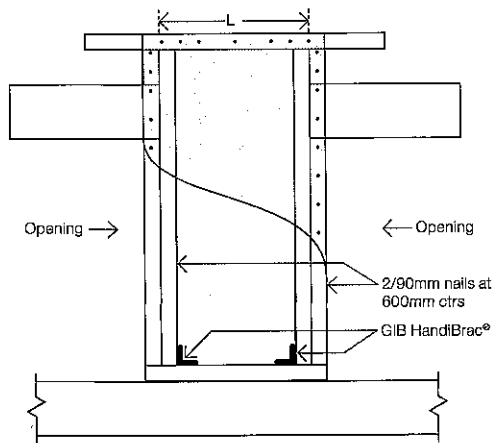
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element



GIB EzyBrace® Systems specification GS1-N

Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING**Timber floor**

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING**Fasteners**

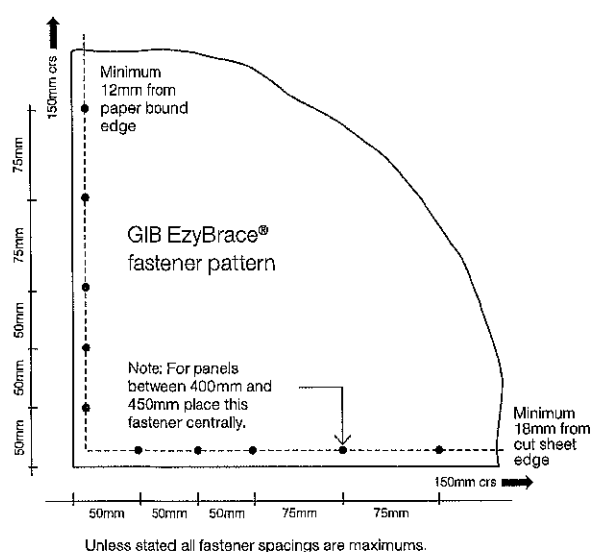
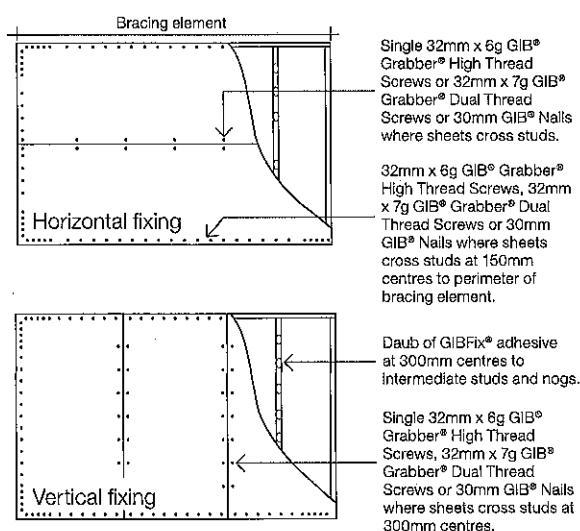
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100mm x 3.75mm nails at 600mm centres; or three power driven 90mm x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75mm x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

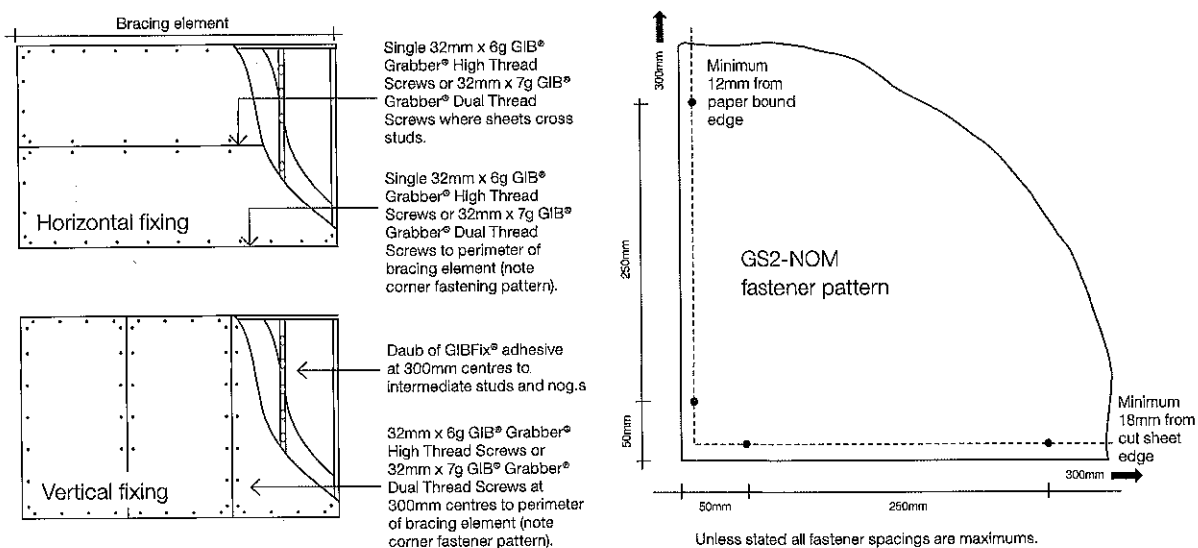
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

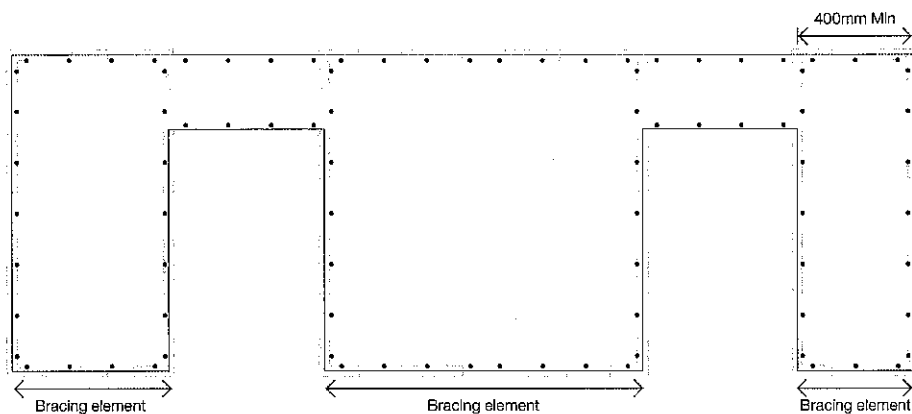
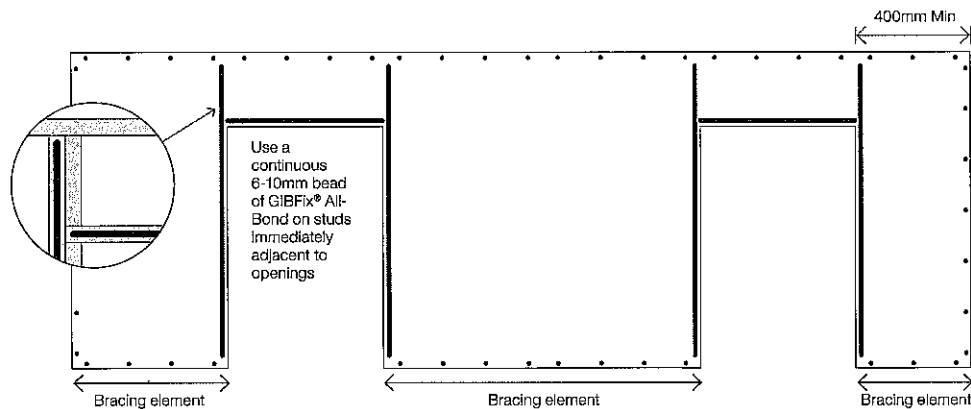
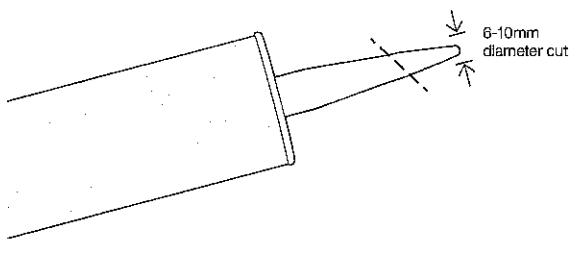


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



— GIBFix® All-Bond Adhesive

ADHESIVE NOZZLE APERTURE



GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

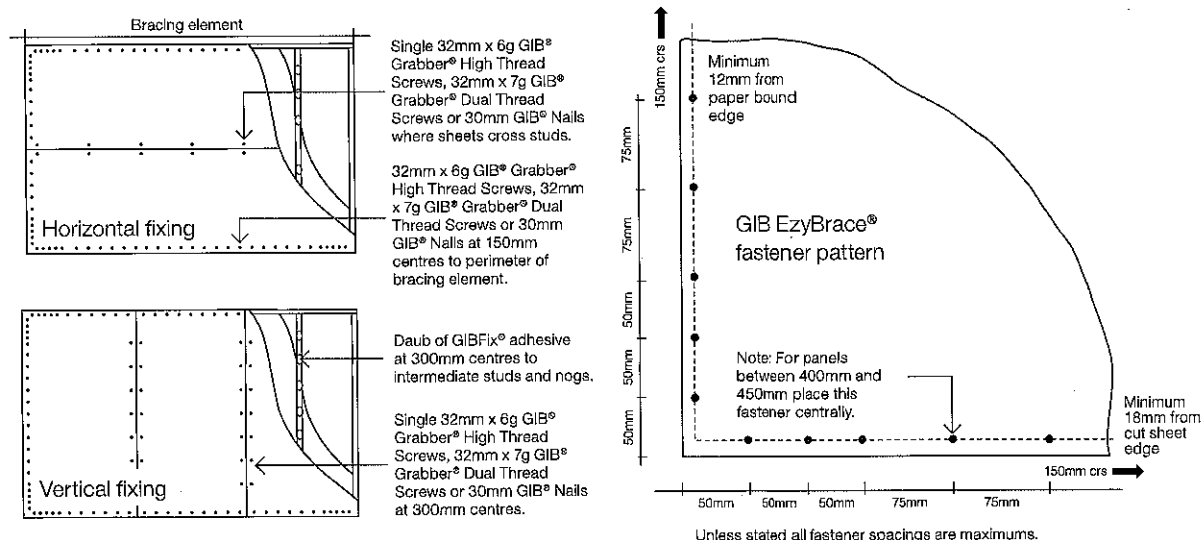
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

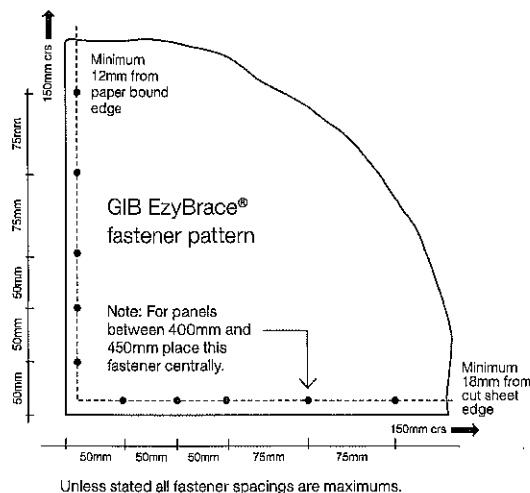
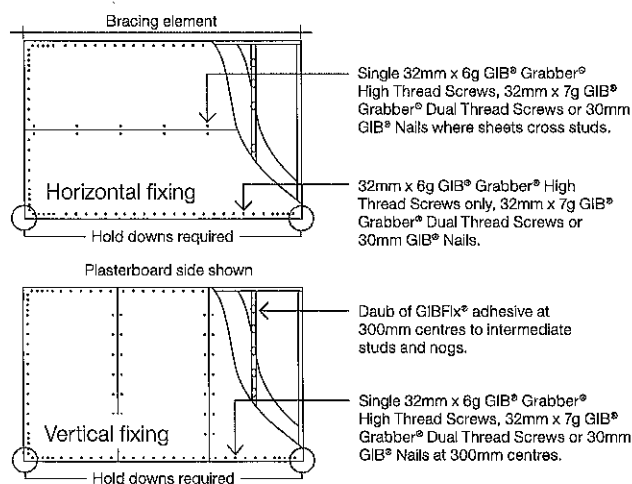
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems



GIB EzyBrace® Systems specification BL1-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING**Timber floor**

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline®
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING**Fasteners**

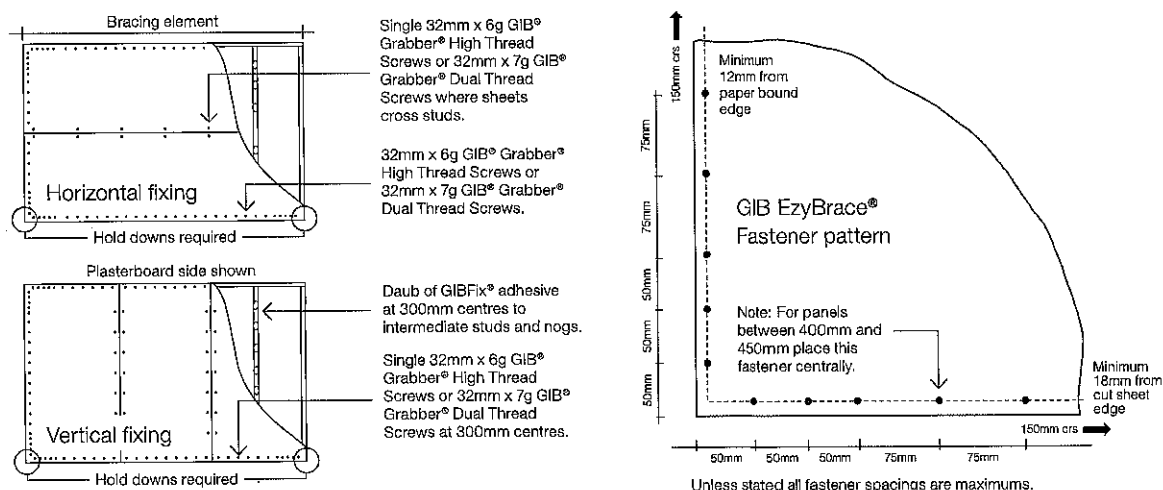
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm from maximum each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the sheet joint. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems



GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING**Timber floor**

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING**Fasteners**

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

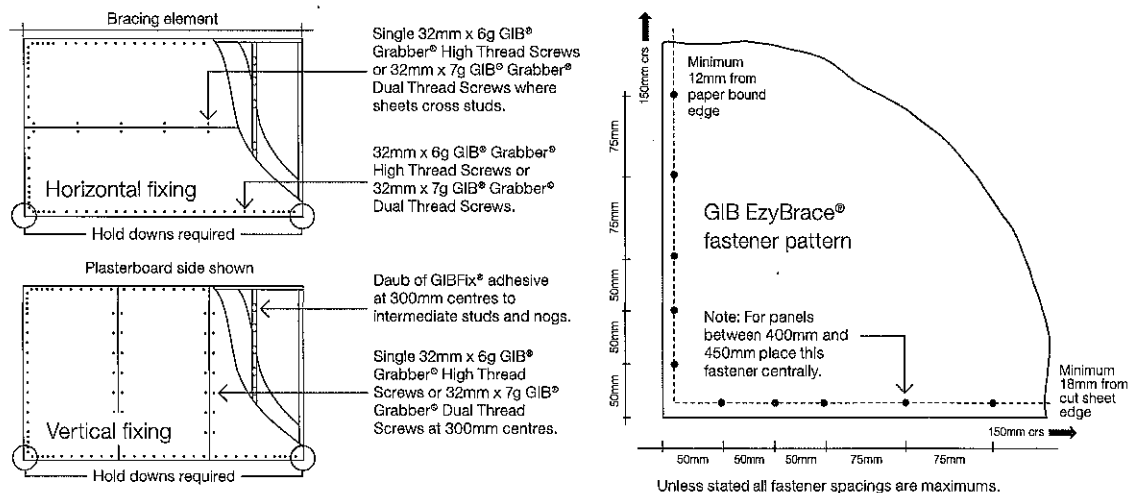
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



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GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure; B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

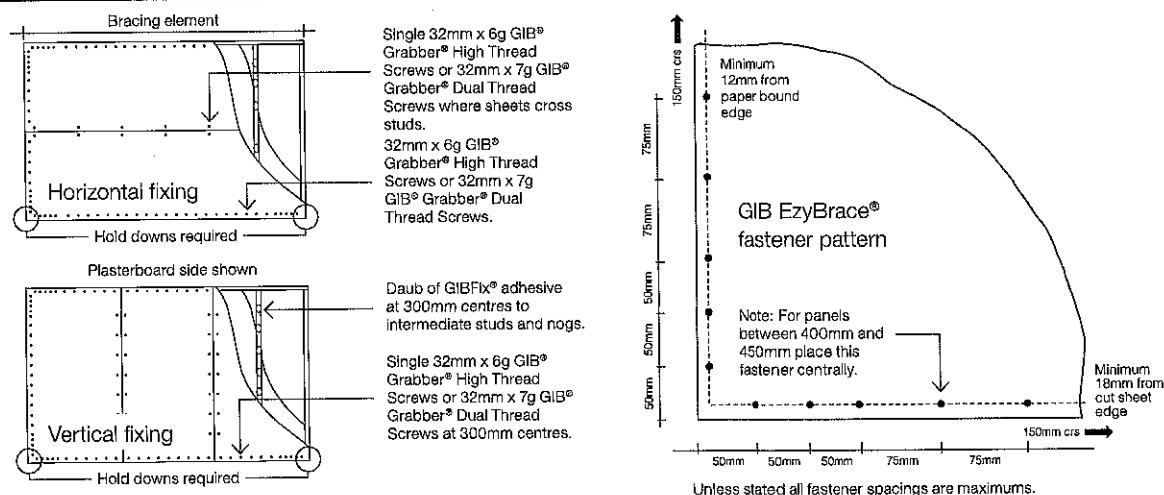
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems



Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERT™}

The Global GreenTag^{CERT™} certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag^{CERT™}.

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

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Winstone Wallboards asserts its moral rights and reserves all other intellectual property rights in the materials contained in this brochure and related to GIBFix® Framing System and GIB EzyBrace® Systems.

TRADEMARKS

The names GIB®, GIB Fyreline®, GIB Ultraline®, GIB Braceline®, GIB Toughline®, GIB Noiseline®, GIB Aqualine®, GIB Nail®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, the colour mauve for GIB Toughline®, GIB HandiBrac®, GIB EzyBrace®, the colour blue for GIB Braceline®, the colour pink for GIB Fyreline®, the colour green for GIB Aqualine®, and the shield device are registered trademarks of Fletcher Building Holdings Limited.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.



FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

