

SPECIFICATION

of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

Burgess & Allen

Project Specification

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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:

NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4781	Code of Practice for Safety in Welding and Cutting
AS/NZS 5131	Structural steelwork - Fabrication and erection
NZS 6803	Acoustics - Construction Noise
Building Act 2004	
Building Regulations 1992	
Health and Safety at Work Act 2015	
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016	
Health and Safety at Work (Hazardous Substances) Regulations 2017	
Health and Safety in Employment Regulations 1995	
New Zealand Building Code	
Heritage New Zealand Pouhere Taonga Act 2014	
Resource Management Act 1991	
Smoke-free Environments Act 1990	
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Good Practice Guidelines - Excavation Safety
WorkSafe	Scaffolding in New Zealand - Good Practice Guidelines
WorkSafe	Managing Work Site Traffic - Good Practice Guidelines

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
- Branded work sections
- Care of construction documents
- Confidentiality of documents
- Receipt of construction documents

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the original building consent forms and documents from the owner and keep them on site, preserve the condition of consent forms and documents. Liaise with the building consent authority 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 LBP previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Foundations 2 Concrete or timber pile foundations constructor
- Bricklaying and block laying 1 Brick / masonry veneer
- Bricklaying and block laying 2 Structural masonry - Bricklayer / Blocklayer
- Roofing 1 Concrete / clay tile roofer
- Roofing 2 Profiled metal roofer and/or wall cladding installer
- Roofing 3 Metal tile roofer
- Roofing 4 Membrane roofer
- Roofing 5 Torch on membrane roofer
- Roofing 6 Liquid membrane roofer
- Roofing 7 Shingle / slate roofer
- External plastering 1 Solid plasterer
- External plastering 2 Proprietary Plaster Cladding Systems (PPCS) plasterer

Also provide names and contact details of the following

- Registered drainlayer

- Registered plumber
- Registered gasfitter
- Registered electrician

1.5 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

1.6 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 (PS1) - Design
- Producer Statement (PS3) - Construction from the applicator / installer
- Producer Statement (PS4) - 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.

1.7 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.

Residential building contract

1.8 CHECKLIST

If requested provide evidence of the prescribed checklist given to the residential client.

1.9 DISCLOSURE STATEMENT

If requested provide evidence of the disclosure statement given to the residential client.

1.10 BUILDING CONTRACT

If requested provide evidence of the written building contract that the residential customer has signed.

1.11 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.

Substitutions

1.12 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.13 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified products and systems listed in a section unless specified otherwise. If a product is not available then immediately contact the contract administrator for direction.

1.14 PROPOSED SUBSTITUTIONS

Substitution of products or systems contained within branded work sections is not allowed. The contractor may propose substitutions to products within non branded work sections, when the contractor has determined that the proposed substitution is an alternative to the specified product. The Contract administrator is not bound to accept any substitutions. Submit a draft proposal detailing the substitution to the contract administrator before proceeding with full notification.

1.15 NOTIFICATION OF SUBSTITUTIONS

Notify the contract administrator of 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

1.16 ACCEPTANCE OF SUBSTITUTIONS

Acceptance of any proposed substitutions will be given in writing by the contract administrator.

Amendments to issued Building Consent

1.17 CONTRACTOR AMENDMENTS 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 amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.18 PRINCIPAL AMENDMENTS 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

1.19 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

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

1.20 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.

1.21 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.

Branded work sections**1.22 BRANDED PRODUCTS / SYSTEMS**

Where branded products and systems are specified, all products and components of the system must be as per the specification.

1.23 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.

Care of construction documents**1.24 CONSTRUCTION ISSUE**

Take receipt of the plans, specifications and other documents issued "for construction". Keep at least one copy on site available for use by all on site workers. Keep a record of copies provided to others including subcontractors. Protect the documents as appropriate. Obtain replacement copies for documents that have become damaged.

1.25 REVISIONS TO CONSTRUCTION ISSUE

Where revised plans and other documents are issued ensure that superseded documents are deleted from the working sets. Ensure that subcontractors are provided with amended documents. Delete superseded documents by either:

- removing them from the working copy of the construction issue; or
- marking them as superseded

1.26 RETURN DOCUMENTS ISSUED FOR CONSTRUCTION

On completion of the contract works:

- Keep such copies of the plans, specification and other documents as reasonably required for contractor's record purposes.
- Retrieve all other copies no longer required by parties.
- Agree method of disposal of such documents with the Contract Administrator.

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or
- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

Confidentiality of documents**1.27 CONFIDENTIALITY OF DOCUMENTS**

Documents shall not be given or copied to others who do not require them for carrying out services required for the construction of the works. Documents are only to be used for the contract. Maintain confidentiality of documents.

2 SELECTIONS

1250 TEMPORARY WORKS & SERVICES

1 GENERAL

This general section relates to temporary works and services required for the construction of the contract works. It includes

- Temporary works and services including temporary fencing and hoardings
- Scaffolding
- General care and protection
- Rubbish removal

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

Maintain alter, adapt and move temporary works and services as necessary. Clear away when no longer required and make good.

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

Take reasonable precautions to prevent unauthorised access, including access outside working hours, to the site, the works and adjoining property. Safeguard the site, the works, materials and plant from damage and theft.

1.4 CONSULTANTS TEMPORARY SITE OFFICE

Provide temporary accommodation and facilities for site meetings and for use by consultants while on site.

1.5 SITE FENCING

Provide and maintain a site fence, 2 metres high from ground level on the side accessible to the public. Construct to comply with [NZBC F5/AS1](#) Construction and demolition hazards. Construct as required for public areas and as shown on the drawings.

Construct the fence with:

- galvanized chain link netting with a 50mm x 50mm maximum grid size
- posts at 2.5 metre centres maximum
- gap at the bottom of the fence no greater than 100mm

1.6 SITE FENCING - NON-PUBLIC AREAS

Provide and maintain a 1 metre high site fence to non-public areas. Construct using:

- warratah stakes at 1.5 metre centres fitted with safety caps
- plastic safety mesh

1.7 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

Provide appropriate measures to prevent or minimise sediment generation and silt run off. Comply with territorial and other authority requirements relating to carrying out earthworks.

Prevent silt run off by:

- exposing only as much ground as required at any time
- providing run off channels, contour drains or earth bunds to divert clean water away from the site on to stable sealed or grassed ground
- capture silt by the use of silt fences, vegetation buffer strips, sediment ponds or earth bunds.

Provide sediment control by:

- earth bunds constructed across the slope to control and detain run off
- silt fences constructed using filter fabric stretched between posts at a maximum of 1 metre spacing.

Pump water from trenches and other areas of the site using methods to prevent sediment entering any drain or watercourse. Filter dirty water before discharging into drainage system.

1.8 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

Provide appropriate measures to prevent cement/concrete washwater or slurry run off to; drains or waterways, landscaped areas new or remaining and adjoining public or private properties. Comply with territorial and other authority requirements relating to cement/concrete washwater.

Control run off from:

- Cement/concrete based material production, placing and finishing.
- Hosing down and cleaning of, tools and equipment, fresh material, and spilt or surplus material, pumps and mixers etc.
- Wet cutting or grinding.
- Slab watering etc.
- Water cleaning of new concrete elements, fresh used formwork etc.

Small project with relatively large exposed ground areas - prevent run off by:

- directing small amounts of washwater onto the area of ground closest to the work.
- for larger amounts provide run off channels, and small soak pits
- very small amounts of washwater with no aggregate and only a small amount of sand may be spread over existing lawns.

Large project and those without suitable ground area - prevent run off by:

- plan and implement washwater control measures based on the expected volumes, allow for the timely removal and safe disposal of liquids and solids.
- Limit the volume of water used for washing down to the extent required.
- Control the flow of washwater so that it is directed to proper catchments.
- providing watertight bunds, pits or tanks, filtered washwater is not to be discharged to drains.

Spilt or surplus material:

- if possible allow to set and either use or dispose of as hardfill.
- pre-made concrete items, either use or dispose of as hardfill.

Pump washwater away from drains, waterways and adjoining property.

1.9 EXCAVATION SAFETY

To the [Health and Safety at Work Act 2015](#).

Carry out excavation to [WorkSafe, Good Practice Guidelines - Excavation Safety](#). This may include deep excavation, trenching, and areas behind unfilled retaining walls.

Carry out excavation using plant and equipment suitable for the purpose.

Scaffolding

1.10 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:

- [Health and Safety at Work Act 2015](#)
- [Health and Safety in Employment Regulations 1995](#)
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- [Worksafe - Scaffolding in New Zealand - Good Practice Guidelines](#)

Temporary services

1.11 WATER

Provide clean, fresh water for the works and make arrangements for distributing about the site.

1.12 ELECTRICITY

To AS/NZS 3012.

Nominate the person to install and be responsible for the complete temporary electrical installation.

The name and designation of the person responsible is to be displayed prominently and close to the main switch or circuit breaker.

Inspect and overhaul the installation at such intervals as are prescribed by the network utility operator but not more than three monthly intervals.

1.13 TELEPHONE

Provide on-site temporary telephone facilities.

1.14 COMPUTER FACILITIES

Provide on-site temporary computer facilities complete with an email and internet connection capable of sending, receiving and printing site communications.

1.15 PRINTER

Provide on-site temporary printing facilities capable of printing A4 and A3 colour prints.

1.16 IMAGING

Keep available devices able to take and send quality printable digital photographs.

Care and protection - Site**1.17 LOCATE AND PROTECT SURVEY MARKS**

Review information provided relating to survey marks. Physically locate and protect survey marks. Where required use a licensed cadastral surveyor to reinstate survey marks disturbed during construction.

1.18 LOCATE EXISTING SERVICES

Review information provided relating to underground and above ground services. Physically locate the position of all such services. Arrange with the network utility operator for all necessary exploratory work, location, protection, isolation, off-setting, reinstatement or alterations required. Record any alterations made to such utilities.

1.19 PROTECT EXISTING SERVICES

Protect existing services and parts of service systems, whether indicated or not, that are to remain in place during the execution of the works. Provide temporary caps or covers to prevent the ingress of dust and other contaminants into the systems, ducts, pipes etc. Reinstate where required and repair any damage resulting from carrying out the contract works.

1.20 PROTECT EXISTING LANDSCAPE ELEMENTS

Protect existing trees, fences, gates, walls, gardens and other designated landscape features which are to remain in position during the execution of the works. Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.

1.21 MAKE GOOD - SITE

Make good all damage to existing roads, footpaths, grounds, services, landscape elements and site features caused in carrying out the contract works.

Care and protection - miscellaneous**1.22 CONSTRUCTION KEYING AND SECURITY**

Provide locksets with temporary keying, or install with the cylinders removed.

1.23 TEMPORARY STORAGE

Provide temporary storage areas and protective covers and screens to meet the requirements of the products to be stored.

Rubbish removal**1.24 PERIODIC RUBBISH REMOVAL**

Maintain on site appropriate means for the storage and removal of construction waste material. Where required or appropriate provide for the separate storage of recyclable waste and other materials requiring special disposal.

1270 CONSTRUCTION

1 GENERAL

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

- Quality control and assurance
- Noise and nuisance
- Set-out and tolerances
- Common execution requirements
- Qualifications
- Common product requirements
- Common requirements for samples and prototypes
- Common requirements for spare and maintenance products
- Cleaning during the works
- Removal of protection
- Completion requirements
- Commissioning
- Practical completion submission
- Defects period submissions
- Completion submissions

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.

1.2 PROVIDE QUALITY PLAN

Prepare a quality plan for the execution of the contract works and submit a copy of the quality plan to the Contract Administrator within 10 Working Days of the date of award of the contract. The quality plan shall describe the procedures for meeting the requirements of the contract in respect of:

- Materials and workmanship
- Monitoring and maintaining subcontractors' performance
- Record keeping
- The level of documentation for signing off the contract works as complete
- Procedures to ensure that all persons engaged in undertaking the contract works are qualified, experienced and trained for the work they are undertaking
- Inspection and testing required by the contract
- Auditing the quality plan

1.3 REVIEW OF QUALITY PLAN

Within 5 working days of the contractor submitting a quality plan to the contract administrator for review, the contract administrator may advise that:

- they have completed their final review, or
- that they have undertaken a review and require resubmission of the quality plan.

Review by the contract administrator of the quality plan does not make the quality plan a contract document. The contractor at all times remains responsible for the construction of the Works. If resubmission of a quality plan is required, the contract administrator will give their reasons. The contractor shall take account of the reasons and resubmit a revised quality plan within a period of 5 working days.

1.4 COMMENCEMENT OF WORK

Do not commence any part of the contract works, other than establishment, setting out and site preparation until the contract administrator has completed their final review of the quality plan.

1.5 NOTICE

Give notice to the contract administrator and any other nominated person of hold points and notification points. Refer to work sections and 1260 PROJECT MANAGEMENT for hold points and notification points required.

1.6 NOTIFIABLE WORK

Lodge notice of the intention to commence any notifiable work and any work that will at any time include any notifiable work, in accordance with [Health and Safety in Employment Regulations 1995](#).

Noise and nuisance

1.7 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 1995](#) clause 11.

1.8 ACCEPTABLE NOISE LEVELS

Refer to [NZS 6803](#) Tables 2 and 3 for the upper limits of construction work noise received in residential zones, dwellings in rural areas, industrial areas and commercial areas, note also the allowed adjustments. Do not exceed these limits or any limits imposed by regional councils or territorial authorities.

1.9 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](#), table 2 and table 3, cease the noise generating operation and remedy the problem.

1.10 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.

1.11 ROADWAY AND FOOTPATH

Keep the adjacent footpath and road clear at all times. Where work must be carried out in the roadway or footpath, obtain required consents from the territorial authority. Where temporary use is made of the footpath or roadway for deliveries and the like ensure that public safety is protected and the goods and materials moved as soon as practicable. Sweep, wash and otherwise clean the roadway/footpath and restore it to its previous condition.

1.12 VEHICLE CROSSING

Make good damage that has occurred as a result of carrying out the contract works. Where there has been significant damage, contact the territorial authority and obtain instructions for making good. Pay the territorial authority costs associated with making good.

1.13 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.

1.14 DAMAGE AND NUISANCE

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

1.15 SMOKE FREE REQUIREMENTS

In accordance with the Smoke Free Environments Act 1990 smoking is not allowed on site.

1.16 RESTRICTIONS

Do not:

- light rubbish fires on the site.
- bring dogs on to or near the site.
- bring radios/audio players on to the site.

Set-out and tolerances**1.17 SURVEY INFORMATION**

Locate and verify survey marks and datum points required to set out the works. Where these do not exist or cannot be located advise the contract administrator who will arrange for the required points to be established.

Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.18 DATUM

Establish a permanent site datum to confirm the proposed levels and their relationship to all other existing and new levels.

1.19 SET-OUT

Set out the work to conform with the drawings.

1.20 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.

1.21 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Arrange for the licensed cadastral surveyor to provide a certificate certifying that the building has been constructed within the allowed height in relation to boundary. Obtain details from the principal of the person they have engaged to carry out this certification and advise the surveyor when they can carry out the required survey.

Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator.

1.22 USE OF SET-OUT INSTRUMENTS

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

1.23 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.

1.24 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
Structural steelwork:	To NZS 3404.1 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)

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

Execution

1.25 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it depends, to ensure it is of the required standard.

1.26 REPORT DEFECTIVE PREVIOUS WORK

Refer defects to the contractor to be remedied, if the remedy is outside the scope of the contract documents the contractor shall obtain direction from the contract administrator. Do not carry out work over previous work that is defective and will affect the required standard.

1.27 EXECUTION GENERALLY

Construct the work in accordance with the documents issued for construction including any direction that may have been given by the contract administrator that varies the construction document.

1.28 EXECUTION - NO DETAIL IS PROVIDED

The documents issued for construction will not include all details relating to every material, junction and interface with other materials.

Where the detail provided is of a general nature, or where no detail is provided, refer to the manufacturer's documents for information relating to installation and execution of that part of the work.

Where there is more than one method or detail appropriate to the part of the work in question, refer the options to the Contract Administrator for direction as to which detail or method to use.

1.29 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

Where a NZBC Acceptable Solution is referred to in the specification but not shown on the plans, obtain a copy of that Acceptable Solution and make it available to the workers carrying out that part of the work.

1.30 MINIMISE DELAYS DUE TO WEATHER

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

Qualifications

1.31 QUALIFICATIONS GENERALLY

The work is to be carried out by workers and / or supervisors who are experienced, competent and familiar with the materials and the techniques specified. Workers must also be familiar with the manufacturers' and suppliers' installation and application instructions and standard details provided by them in relation to the use of the products for this project. If requested provide evidence of qualification / experience.

1.32 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

Where restricted building work (RBW) forms part of the contract works, workers, or supervisors of that work must be licensed building practitioners (LBP) holding current licenses for the particular restricted building work.

For rare instances where non-RBW also requires an LBP refer to individual work sections for details.

1.33 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Where required by a manufacturer or supplier, workers must be specifically trained /approved / accredited / registered / licensed / certified by them. Refer to individual work sections for details.

1.34 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Where workers and / or supervisors of work are required to be licensed, registered or similar under legislation, they must have a current license before they start the work and maintain currency until their part of the work has been completed and all documentation that is required has been provided.

1.35 QUALIFICATIONS – PRODUCER STATEMENTS

Where producer statements are required for parts of the work, ensure that person is suitably qualified and authorized to issue such producer statements.

1.36 REPLACEMENT OF PERSON

Should it be necessary to replace a person, ensure that records of work, producer statements, warranties and the like required for the part of the work they have carried out are obtained.

Ensure that the replacement person takes responsibility for the work they carry out and that they are able to provide such records of work, producer statements, warranties and the like required as a condition of the contract and the building consent.

Products

1.37 NEW PRODUCTS

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

1.38 COMPATIBILITY OF PRODUCTS

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.

1.39 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Protect products during transit and delivery on site and / or off site. Reject and replace goods that are defective or damaged or will not provide the required finish.

Handle products carefully to avoid damage and distortion and in accordance with codes of practice and the manufacturer's or supplier's requirements. Avoid any contact with potentially damaging surfaces or conditions.

Store products to avoid visual damage, environmental damage, mechanical damage and distortion. Store in accordance with codes of practice and the product manufacturer's or supplier's requirements. Maintain the proper condition of any protective packaging, wrapping and support.

Refer to individual work sections for any special requirements.

1.40 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.

1.41 INSTALLING PRODUCTS

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.

1.42 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.

1.43 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.44 INCOMPATIBLE PRODUCTS

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

1.45 SAMPLES FOR REVIEW

Where specified in the work sections submit samples and any nominated supporting documentation to the named reviewer and notify the contract administrator of the submission. Where no person is named as the reviewer, submit to the contract administrator.

Samples for review may be described as a portable sample for review, portable control sample, fixed sample for review or fixed control sample. A portable sample refers to a sample that is easily movable, convenient for carrying. A fixed sample refers to a sample that is not portable. If the location of a fixed sample is not defined in the work section, obtain direction from the contract administrator.

For samples that are located on site, or by agreement with the contract administrator are located off site, notify the reviewer and contract administrator of their location and availability for review.

Timing for the provision and review of samples is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review. Allow for such resubmission and further review as may be required. No extension of time will be allowed for resubmission and further review.

Obtain written instructions in relation to the samples from the contract administrator. Do not proceed further with related work items until advised to continue.

Samples may be incorporated in the finished work if confirmed in writing by the contract administrator, otherwise allow to completely remove any fixed samples. Remove from the site any rejected samples.

Refer to SAMPLES clauses in work sections for further detail.

1.46 CONTROL SAMPLES

Samples become control samples if an instruction is given by the contract administrator to that effect. Control samples will be used for comparison purposes throughout the contract. Control samples may be portable or fixed in place, refer to SAMPLES clauses in work sections for further detail.

Control samples that are to remain on site, or otherwise in the care of the contractor, are to be maintained in original condition.

If confirmed by the contract administrator, fixed control samples may be incorporated in the finished work, otherwise allow to remove fixed control samples from site when instructed by the contract administrator.

1.47 OTHER SAMPLE REQUIREMENTS

Where specified in the work sections obtain samples for the purposes described.

Prototypes

1.48 PROTOTYPES - TESTING

Where specified in the work sections provide and test prototypes. Timing for the provision, testing, disassembling, re-assembling, retesting and review of prototypes and test results is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review of test results. Submit test results to the named reviewer and to the contract administrator. Where no person is named as the reviewer submit test results to the contract administrator.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - TESTING clauses in work sections for further detail.

1.49 PROTOTYPES - REVIEW

Where specified in the work sections provide prototypes for review. Timing for the provision, disassembling, re-assembling and review of prototypes is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for review by the named reviewer. Where no person is named as the reviewer notify the contract administrator for direction.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - REVIEW clauses in work sections for further detail.

1.50 PROTOTYPES - GENERAL

Refer to the PROTOTYPES - TESTING and PROTOTYPES - REVIEW clauses in work section for details on what is to happen after the review and or testing of the prototype is complete. Where no information is provided refer to the contract administrator for direction.

Prototypes may become control samples if an instruction is given by the contract administrator to that effect.

Spares & maintenance products

1.51 SPARES & MAINTENANCE PRODUCTS

Collect, protect, package, label and store safely all spares and maintenance products specified in the work sections. Give the contract administrator an inventory of all spares and maintenance products.

If no instruction is given within a work section for the location of spares and maintenance products, then deliver to the owner ~.

If no instruction is given within a work section for timing in relation to the provision of spares and maintenance products, then provide at practical completion.

Refer to SPARES & MAINTENANCE PRODUCTS clauses in work sections for further detail.

Cleaning during the works

1.52 PERIODIC SITE CLEANING

Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site. Keep food waste separate from construction waste.

1.53 TRADE CLEANING

Keep the work area clean, remove of all debris, unused and temporary materials and elements from the site as work progresses and on completion. Refer to individual work sections for any specific requirements.

Remove protection

1.54 REMOVE PROTECTION

Remove all temporary markings, labels, packaging and coverings to products unless instructed otherwise, or where they are required for protection.

Maintain temporary protection until removal is required by the manufacturer/supplier, the execution of the work or the requirements of individual work sections. Re-establish protection as necessary.

Remove temporary protection and special protection immediately prior to practical completion or before when there is no further risk of damage.

Refer to individual work sections for any special removal requirements.

Completion

1.55 REMOVE CONSTRUCTION WASTE

Remove all debris, unused materials and the like from the site. Arrange for material to be recycled to be collected or delivered to the recycler.

1.56 COMPLETE ALL SERVICES

Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

1.57 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.
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass. Do not use metal scrappers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Remove rubbish and building material from the area immediately adjacent to the contract

works.

Commissioning

1.58 MOVING PARTS

Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.

1.59 INSTRUCTION AND DEMONSTRATION

Provide instruction and demonstration to the owner/occupier to the extent that is listed below and as required for them to reasonably occupy and use the building. This is to include at least the following:

- Location and isolation of all services connections.
- Operation of all emergency systems.
- Locking and security arrangements.
- Operation of basic building services including lighting, heating, mechanical ventilation, air conditioning and security.
- Special cleaning requirements and procedures.
- Any other features that the owner/occupier needs to know about.

1.60 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.

Practical completion submission

1.61 ADDITIONAL PRACTICAL COMPLETION INFORMATION

In addition to requirements in the contract and contained elsewhere in the specification provide the following information submissions for practical completion:

- All documents which the contractor has obtained on behalf of the owner/occupier.
- Information required by the owner/occupier to be able to use the building.
- Advice that NUO accounts in the contractor's name have been closed and as appropriate changed to be in the name of the owner/occupier.
- A list of persons to be contacted to carry out any emergency or remedial work including 24 hour/7 day contact details.

1.62 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

Refer to the conditions of contract for the definition of practical completion and the conditions relating to practical completion.

In addition to the requirements in the contract, the following conditions also apply:

- ~

Defects period submissions

1.63 DEFECTS REMEDIATION - SUBMISSIONS

Provide the following at periods required by the contract administrator, where no period is stated, provide this information monthly:

- A copy of the contractor's check list identifying remaining defects and omissions to be completed recording progress made in completing and correcting the items.
- A copy of lists issued by the principal/employer identifying omissions and defects recording progress made in completing and correcting the items.
- A copy of lists issued by the contract administrator identifying omissions and minor defects recording progress made in completing and correcting the items.

Completion submissions

1.64 FINAL COMPLETION - SUBMISSIONS

In addition to requirements in the contract and contained elsewhere in the specification provide:

- Contractors advice that all defects have been corrected and omissions and deferred work completed.
- All documents which the contractor has obtained on behalf of the owner/occupier.

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](#) [Good Practice Guidelines - Excavation Safety](#)

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details;

Company: ~

Web: ~

Email: ~

Telephone: ~

1.3 SITE SAFETY

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

1.4 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 VOLCANIC TUFF FILL

Scoriaceous tuff of variable grading excluding excessive silt or clay material, capable of being placed and compacted as specified.

2.3 ROCK FILL

Hard material comprising rock, broken stone, hard brick, concrete, run of pit scoria, or other comparable inert material capable of being placed and compacted as specified.

2.4 SAND FILL

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

2.5 HARD FILL

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

2.6 GRANULAR FILL

Approved screened crushed gravel or scoria, graded in size from 20mm to 7mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.

2.7 DRESSING COURSE

Scoria to GAP 20 grading, or "dirty footpath scoria", or equivalent "all in" graded crushed metal aggregate.

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

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, 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 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.

3.6 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.

3.7 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.

3.8 GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

3.9 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.

3.10 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.

3.11 INADEQUATE BEARING

If localised 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:

- Below slabs on grade: Hardfill compacted in 150mm layers
- Below footings: 10 MPa concrete

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.

Confirm any changes with the territorial authority.

For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

3.12 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.

3.13 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.

3.14 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.

3.15 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200mm layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing are not damaged.

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:

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

Performance

2 PRODUCTS

2.1 CONCRETE PILES IN SITU

To [NZS 3604](#) for concrete, reinforcement, footing and type.

2.2 CONCRETE PILES PRE-CAST

200mm square parallel-sided to [NZS 3604](#) for footing and type.

2.3 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.

2.4 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.

2.5 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.

2.6 BOLTS

Steel, stainless steel, and galvanized steel to [NZS 3604](#). Refer to SELECTIONS.

2.7 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.

2.8 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).

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 CONCRETE PILES IN SITU

Box for, reinforce and pour in 17.5 MPa concrete the footings and piles in the various types to [NZS 3604](#).

3.4 INSTALL CONCRETE PILES PRECAST

Pour 17.5 MPa concrete footing and set in pre-cast concrete piles in the various types to [NZS 3604](#).

3.5 INSTALL ROUND TIMBER PILES

Prepare for and drive timber piles to [NZS 3604](#), section 6.6, **Driven timber piles**. Protect pile heads with a suitable cushion.

3.6 INSTALL SQUARE TIMBER PILES

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

3.7 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

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:

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

Concrete 10 MPa with minimum water for workability, all materials and batching to [NZS 3104](#), table 3.1, Prescribed mixes (P).

2.3 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](#).

2.4 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground mesh to be welded reinforcing mesh to [AS/NZS 4671](#), Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m² (1.14kg/m² in each direction).

2.5 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.6 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.

Accessories

2.7 WATERPROOFING FOR EXTERIOR OPENINGS

Unreinforced wet area membrane to [AS/NZS 4858](#) for waterproofing around openings for windows, doors, meters and other services openings, at or above floor level, also parapets and ends of masonry walls abutting other claddings to [CCANZ CP 01](#). Refer to SELECTIONS. Do not use bituminous coatings.

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 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 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.

3.4 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.5 TOLERANCES, BENDING

To [NZS 3109](#), 3.9, Tolerances for reinforcement.

3.6 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.

3.7 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.

Wire mesh laps to [NZS 3101.1](#), lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.8 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.9 REINFORCEMENT COVER TO NZS 3101.1

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to [NZS 3101.1](#), table 3.6, **Minimum required cover for a specified intended life of 50 years**. Sub-soil cover to [NZS 3101.1](#), to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to [NZS 3109](#), 3.9, Tolerances for reinforcement.

3.10 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

For in-situ concrete, foundations and interior slabs on ground, to [NZS 3604](#) or [NZS 4229](#), the reinforcement and welded mesh cover to be:

Location, cover to	NZS 3604	NZS 4229
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

3.11 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.

3.12 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with [NZS 3109](#), 5.6, Type B.

3.13 PRE-PLACEMENT INSPECTION

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

3.14 SURFACE FINISHES

To [NZS 3114](#), 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.15 CONCRETE SURFACE TOLERANCES

To [NZS 3114](#), 104, Surface tolerances and [NZS 3114](#), 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.16 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.

3.17 COMPACTION

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

3.18 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to [NZS 3604](#) as modified by [NZBC B1/AS1](#) and [NZBC E2/AS3](#). Construct to [NZS 3604](#), 4.5 **Concrete and concrete masonry** and [NZS 3604](#), 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by [NZBC B1/AS1](#), 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to [NZS 3114](#), 304, **Surface tolerances**.

Allow for free joints maximum 24m centres to [NZBC B1/AS1](#), 3.1.13 [NZS 3604](#) New clause.

3.19 FLOOR SLABS TO NZS 4229

Generally for slabs on ground to [NZS 4229](#) as modified by [NZBC B1/AS1](#) and [NZBC E2/AS3](#). Construct to [NZS 4229](#), 6, **Footings** and [NZS 4229](#), 7, **Foundation walls and concrete slab-on-ground** as modified by [NZBC B1/AS1](#), 2.0 **Masonry**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to [NZS 3114](#), 304, **Surface tolerances**.

Allow for free joints maximum 18m centres to [NZS 4229](#), 7.8.5.3 **Free joints**.

3.20 SAW CUTS TO NZS 3604 OR NZS 4229

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 °C, and 48 hours for average ambient temperatures below 20°C).

3.21 SAW CUTS

Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring.

3.22 SPACING OF SAW CUTS

Spacing of sawcuts

Floor situation	Maximum spacing of sawcuts both ways
Industrial floor	5m
Architectural, exposed floor, thin finishes, rigid finishes	4m
Carpet on underlay flooring	6m

3.23 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.

3.24 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.

3.25 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.26 WATERPROOFING EXTERIOR OPENINGS

Apply waterproofing to the exposed face of openings for, windows, doors, meters etc, also if necessary the top of parapets/balustrades and ends of masonry walls abutting other claddings. To [CCANZ CP 01](#), waterproofing manufacturer's requirements and as detailed. Provide temporary protection from direct sunlight.

3.27 CLEAN OUT

Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

3.28 REMOVE

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

4 SELECTIONS

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:

NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
AS/NZS 1170.0	Structural Design Actions - General principles
AS/NZS 1170.2:2011	Structural Design Actions - Wind actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
FTMA CoP	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 AS BUILT DOCUMENTS

Refer to the general section 1238 AS BUILT DOCUMENTATION for the requirements for submission and review of as built documents and records.

Provide the following as built documents and records:

~

- Provide final post fabrication as built information for construction and code compliance purposes. .

1.12 DESIGN STATEMENT - BUILDABLE TRUSS LAYOUT SERVICE

Roof truss layouts, a truss design statement and a producer statement (design) produced by MiTek Buildable Truss Layout (BTL) service have been included as a part of building consent documentation.

1.13 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

1.14 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

1.15 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

1.16 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

MiTek® (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 STAINLESS STEEL TOOTHED CONNECTOR PLATES

GANG-NAIL® 1.2mm to 2.0mm thick 316 grade, GS12 stainless steel sheet, punched to form a toothed connector.

2.5 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.

2.6 BOWMAC STAINLESS STEEL STRUCTURAL BRACKETS

MiTek® BOWMAC® >3mm thick, 304 stainless steel plate brackets with stainless steel bolts/screws and washers.

2.7 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 straps 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 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

3.5 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.

3.6 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.

3.7 ROOF BRACING

Refer to 3821M MITEK TIMBER FRAMING for roof bracing of trussed roofs.

3.8 WALL BRACING

Refer to 3821M MITEK TIMBER FRAMING for wall bracing.

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.

3813F FUTUREBUILD® NZ - LVL STRUCTURAL FRAMING

1 GENERAL

This section relates to the supply and installation of Futurebuild LVL engineered wood products including:

- hyONE®
- hySPAN®
- hyCHORD®
- hy90®
- hyJOIST®

1.1 RELATED WORK

Refer to 3811 PREFABRICATED STRUCTURAL TIMBER FRAMING for supply of trusses and frames.

Documents

1.2 DOCUMENTS

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

NZBC B1	Structure
AS/NZS 2269.0	Plywood - Structural - Specifications
NZS 3604	Timber-framed buildings
AS/NZS 4357.0	Structural laminated veneer lumber - Specifications

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.3 MANUFACTURER DOCUMENTS

Futurebuild LVL documents relating to work in this section are:

- Futurebuild LVL Residential Design Guide
- Futurebuild LVL Specific Engineering Design Guide
- hyJOIST Design and Installation Guide:2.1
- hyJOIST HJ240 45 and HJ300 45 Brochure
- Product Technical Statement - Futurebuild LVL Products specified for Residential Applications through software and literature
- Product Technical Statement - Futurebuild LVL Products: General/Specific Design
- Product Technical Statement - Futurebuild LVL Products: Specified through designIT for commercial floors
- Product Technical Statement - Futurebuild® LVL Products: Specified through computeIT® Software Solutions
- designIT Software which includes installation details, Design Certificate and Producer Statement

Copies of the above literature and software are available from Futurebuild LVL.

Web: www.futurebuild.co.nz

Email: info@futurebuild.co.nz

Telephone: 0800 808 131 (Customer Services), 0800 585 244 (Technical)

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Futurebuild LVL engineered wood products or associated components or accessories. The structural properties of other manufactures LVL products may not be comparable.

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 CO-ORDINATION

Refer to all drawings to ensure details and fixings required are provided for in the structural LVL work.

2 PRODUCTS

Materials - Laminated Veneer Lumber (LVL)

2.1 HYONE LINTELS & BEAMS

High stiffness structural LVL lintels and beams manufactured to [AS/NZS 4357.0](#)

2.2 HYPAN

Structural radiata pine LVL bearers, lintels, rafters, floor joists, floor and roof beams, to [AS/NZS 4357.0](#).

2.3 HYJOIST

Structural composite "I" beam floor joists and rafters comprised of a cross banded plywood web with LVL flanges in-grade tested to meet published Characteristic Values.

2.4 HYCHORD

Structural LVL truss chords for high load applications and wall studs to [AS/NZS 4357.0](#)

2.5 HY90 LINTEL

Structural LVL lintels and beams manufactured to the requirements of [AS/NZS 4357.0](#)

Components

2.6 JOIST HANGERS

Top mount hangers, full depth face mount hangers and partial depth face mount hangers with nails and/or screws to Futurebuild LVL technical literature requirements.

2.7 WEB STIFFENERS

Futurebuild LVL web stiffeners used to resist web buckling or installed in conjunction with partial height joist hangers, and/or to accommodate uplift forces. Fixed to Futurebuild LVL technical literature requirements.

2.8 STEEL STRAPS

Mild steel galvanized straps, to suit tie down applications for rafters, 27mm x 0.6mm, 25mm x 0.8mm and 25mm x 1.0mm.

3 EXECUTION

Conditions

3.1 ERECTION GENERALLY

Carry out the erection of LVL and associated support framing for houses and similar structures to the requirements of [NZS 3604](#) and/or Futurebuild LVL literature and software as detailed. Comply with [NZBC B1/VM1](#), 6.0 Timber. Refer to Futurebuild LVL guidelines for the installation of LVL structural framing. Prop long length beams and lintels at the mid span until the moisture content has reached a suitable level for the application of internal linings.

Application - hySPAN & hyCHORD

3.2 ERECTION

Lift, place and fix hySPAN or hyCHORD without overstressing or deformation. Use temporary supports as needed without causing damage. Fix hySPAN or hyCHORD to [NZS 3604](#) and/or to Futurebuild LVL requirements. Ensure all members are correctly located, plumb and true to line and face.

3.3 HOLES AND NOTCHES IN SOLID FUTUREBUILD LVL FLOOR JOISTS

Holes and notches in Futurebuild LVL floor joists to [NZS 3604](#) and/or Futurebuild LVL requirements.

Application - hyJOIST

3.4 ERECTION

Lift, place and fix hyJOIST without overstressing or deformation. Use temporary supports as needed without causing damage. Fix hyJOIST to Futurebuild LVL requirements. Ensure all hyJOIST is correctly located, plumb and true to line and face.

3.5 WEB HOLE LOCATIONS IN HYJOIST

Circular holes, square holes and rectangular holes to be located in hyJOIST floor joists as per limitations in the hyJOIST Design and Installation Guide, designIT sITe APP or designIT Software. Do not cut web area as specified. Do not cut, notch or bore through flanges.

3.6 HYJOIST RAFTERS AND OVERHANGS

To Futurebuild LVL hyJOIST Design and Installation Guide, or designIT Software, for details of rafter tie down, restraint at supports, lateral restraint for hyJOIST rafters, ridge support detail, fascia connection detail and overhang details. For sloping soffit with hyJOIST rafters birdsmouthed at supports, cut notch to provide 45mm minimum bearing. Flange must not overhang support. Do not cut beyond flange.

3.7 HYJOIST BEARING AND SUPPORT DETAILS

To hyJOIST Design and Installation Guide, or designIT Software, for details of bearing and support, nailing down to supports, installation of joist hangers, web stiffeners, web stiffeners for double joists, for joists oblique to bearer, concentrated loads from jamb studs or posts and limited notching at end supports.

3.8 JOIST HANGERS FOR HYJOIST JOISTS

To Joist Hanger Specification in Futurebuild LVL hyJOIST Design and Installation Guide, or designIT Software.

Application - hy90 & hyONE

3.9 ERECTION GENERALLY

Lift, place and fix hy90 or hyONE without overstressing or deformation. Use temporary supports as needed without causing damage. Fix hy90 or hyONE to [NZS 3604](#) and to Futurebuild LVL requirements. Ensure all members are correctly located, plumb and true to line and face.

3.10 LINTEL END CONNECTIONS

To hy90 and hyONE Lintels for residential construction - Information for design and installation for lintel end connections and cantilevered lintel connections construction details and to [NZS 3604](#) and/or designIT for houses software for trimming stud connections and tie down where required for uplift.

Completion & Commissioning

3.11 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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:

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice
*A copy of NZS 3604 Timber-framed buildings, 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 LAMINATED TIMBER

Radiata pine laminations to [AS/NZS 1328.1](#); treated as required by [NZS 3602](#), [NZBC B2/AS1](#), to the requirements of [NZBC B2/AS1](#), [AS/NZS 1604.1](#), [NZS 3640](#), with special attention to Appendix B "Specification advisory notes". Supply weather resistant sealed.

2.3 ENGINEERED WOOD

LVL members to [AS/NZS 4357.0](#), to required sizes and lengths and the manufacturer design properties.

Treatment to [NZS 3640](#) and [AS/NZS 1604.1](#).

2.4 TIMBER TRUSSES

To [FTMA CoP](#). Moisture content 16% at supply.

2.5 WALL DWANGS, NOGS AND BLOCKING

If dwangs, nogs or blocking is required for exterior insulated walls, ensure they are not full depth of framing. Install flush with face of wall required, leaving a minimum 20mm or 45mm preferable gap to the other face to [NZS 3604](#), 8.8. Dwangs and nogs if required to be at 1350mm centres maximum to [NZS 3604](#), 8.8.

2.6 EXTERIOR CAVITY WALL BATTENS - PROPRIETARY - NON-STRUCTURAL

Extruded polypropylene battens, size approximately 45mm wide x 18mm thickness. Temporary fix battens before being fixed into the framing with the cladding fixings. To the scope limitations of [NZBC E2/AS1](#), and [NZS 3604](#) Building Wind Zones up to, and including "Extra High".

Components

2.7 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.

2.8 BOLTS AND COACH SCREWS

Bolts and coach screws complete with washers, to the requirements of [NZS 3604](#), clause 2.4.5 Bolts and Coach Screws, and section 4, **Durability**, and of the type, number and form required for each particular junction to [NZS 3604](#), sections 6 - 10.

2.9 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.

2.10 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.

2.11 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).

2.12 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. When necessary provide framing to suit any required cladding/lining control joints and sheet joints.

3.6 FRAMING SUB-FLOOR

Frame up off foundation walls and piles, all fabricated, fastened and braced to [NZS 3604](#), section 6.10, **Framed subfloor walls**.

3.7 FRAMING FLOORS

Framed and fastened to [NZS 3604](#), section 7, **Floors**.

3.8 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to [NZS 3604](#), section 8, **Walls**.

3.9 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**.

3.10 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**.

3.11 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.12 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to [NZS 3604](#). Fit and fix related flashings. Make allowance for cladding control joints where required. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.13 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.14 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4 SELECTIONS

4161MI MARSHALL WEATHERIZATION SYSTEM

1 GENERAL

This section relates to the application of the **Marshall Weatherization System** which consists of:

- **Tekton® Building Wrap** (also called **Tekton HouseWrap**)
- **HYDRA wall underlay**
- **HYDRA roof underlay**
- **SUPER-STICK Building Tape®**
- **Tekton® Seam Tape**
- **One-Piece Sill Tape**
- **TRADE-SEAL** (penetration seal)
- **Protecto Wrap Detail Tape**
- **Protecto Wrap Sill Tape**
- **Protecto Tak** (spray primer/adhesive)

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.
Roof underlay	the same meaning as defined in NZBC E2/AS1 , covering kraft based and synthetic roof underlays

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
NZS/AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Specification for **Marshall 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 444](#) - Protecto Sill Window Sealing System

[BRANZ Appraisal 548](#) - Tekton® Building Wrap

[BRANZ Appraisal 591](#) - One Piece Sill Tape

[BRANZ Appraisal 621](#) - The Marshall Weatherization System

[BRANZ Appraisal 719](#) - Trade-Seal Pipe and Penetration Seal

[BRANZ Appraisal 846](#) - SUPER-STICK Flexible Flashing Tape

[BRANZ Appraisal 1071](#) - HYDRA Roof Underlay

[BRANZ Appraisal 1072](#) - HYDRA Wall Underlay

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

15 years: Provide a material manufacturer/supplier warranty:

15 years:	For Tekton® Building Wrap
15 years:	For HYDRA wall underlay
15 years:	For HYDRA roof underlay
15 years:	For SUPER-STICK Building Tape®
15 years:	For Tekton® Seam Tape
15 years:	For One-Piece Sill Tape
15 years:	For TRADE-SEAL
15 years:	For Protecto Sill Window System

- 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 - WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Work to be carried out by competent, experienced tradespeople, who are familiar with the **Marshall Innovations Limited** materials and techniques specified, by or under the supervision of a Licensed Building Practitioner (LBP) with the relevant Licence Class.

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.

Performance - general

1.7 SURFACE FIRE PROPERTIES FOR LININGS

Flammability index ≤ 5 , to [NZS/AS 1530.2](#). Refer to SELECTIONS.

Quality control and assurance

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 HYDRA WALL UNDERLAY

HYDRA Wall Underlay, a synthetic wall underlay, as a plain non-woven scrim and a woven bottom scrim with a polymeric laminated face. Supplied in rolls 1370mm x 36.5m and 2740mm x 37m.

2.3 SUPER-STICK BUILDING TAPE

SUPER-STICK Building Tape®, a multi-layered silver polyester-faced, copolymer, self-adhesive tape. Utilizes a high tack pressure sensitive adhesive (PSA) combined with a high-performance toughened film. Tape is supplied in 75mm, 150mm and 200mm wide x 22.86m long rolls.

2.4 TEKTON SEAM TAPE

Tekton® Seam Tape, a white polypropylene film coated with a cold weather acrylic adhesive. Tape is supplied in rolls 48mm wide x 50m long.

2.5 ONE-PIECE SILL TAPE

One-Piece Sill Tape, a polythene-faced SBS modified rubberised asphalt self-adhesive membrane. Tape is supplied in rolls 150mm wide x 1.0mm thick x 20m long.

2.6 TRADE-SEAL

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

2.7 PROTECTO WRAP DETAIL TAPE

Protecto Wrap Detail Tape, a black, self-adhering, un-reinforced, conformable, modified SBS rubberised asphalt membrane tape. Supplied in rolls 150mm wide x 1.0mm thick x 15m long.

2.8 PROTECTO WRAP SILL TAPE

Protecto Wrap Sill Tape, a polyethylene-backed, modified SBS rubberised asphalt adhesive membrane tape. Supplied in rolls 150mm wide x 0.5mm thick x 30m long.

2.9 PROTECTO TAK SPRAY PRIMER

Protecto Tak Spray Primer, a solvent-based spray-on adhesive primer, coloured blue. Primer is supplied in a 369g can.

Accessories

2.10 FIXINGS

Staples, clouts, screws, proprietary wrap fixings or other temporary fixings to attach the wall or roof underlay to the framing.

2.11 BUILDING WRAP/WALL UNDERLAY RESTRAINTS

Polypropylene tape or galvanized wire or 75mm galvanized 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 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.4 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 the **Marshall Weatherization System**.

Installation/application - generally

3.5 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

3.6 WRAP/UNDERLAY GENERALLY

To comply with Marshall Innovations Limited specification for the **Marshall Weatherization System**, [BRANZ Appraisal 621](#) - The **Marshall 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.

3.7 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.

3.8 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.

3.9 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.

Installation - HYDRA Wall Underlay

3.10 WRAP/UNDERLAY GENERALLY

To comply with Marshall Innovations Limited specification for the **Marshall Weatherization System, BRANZ Appraisal 1072** - HYDRA Wall Underlay.

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.

3.11 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.

3.12 POSITION ROLL

Position roll against the framing with a short length of wrap/underlay free of the roll. Align the **HYDRA Wall Underlay** with visible studs and nail/staple to the framing.

3.13 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.

Installation - penetrations and joints

3.14 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.

3.15 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.

Installation - openings

3.16 WRAP/UNDERLAY OVER OPENINGS

Run wrap/underlay over any openings and leave covered until windows and doors are ready to be installed.

3.17 FORM OPENINGS

Form openings by cutting wrap/underlay at a 45° diagonal in from each corner. Fold and staple wrap/underlay to the inside of the framed opening.

Installation - SUPER-STICK Building Tape

3.18 SUPER-STICK BUILDING TAPE

To comply with Marshall Innovations Limited specification for **Marshall Weatherization System**, [BRANZ Appraisal 621](#) - The **Marshall Weatherization System** and [BRANZ Appraisal 846](#) - SUPER-STICK Building Tape®.

3.19 PREPARATION

Ensure all surfaces are clean, dry and free of any foreign matter that may adversely affect adhesion. Do not install tape below -6°C. When used in conjunction with LOSP treated timber, allow solvent to evaporate for a minimum of 7 days prior to application. Extend building wrap/underlay over opening and cut on a 45° angle away from each corner. Fold flaps into opening and secure to the interior face of framing.

3.20 SILL AREA – OVER BUILDING WRAP

Cut 4 strips of SUPER-STICK at 150mm x 75mm, Apply 2 strips at a 45 degree angle to the two bottom corners overlapping the corner by 3mm to create a seal at the corner junction. Measure and mark 150mm (for 90mm framing) / 200mm (for 140mm framing) up the jamb from the bottom corners of opening. Measure sill length. Measure and cut a length of **SUPER-STICK** 300mm (for 90mm framing) / 400mm (for 140mm framing) longer than sill length. Roll up the cut length with the split release film to the outside of the roll. Peel back 50mm of the split release film from the inside edge. Align SUPER-STICK with 150mm (for 90mm framing) / 200mm (for 140mm framing) mark and flush with inside edge of the opening. Apply tape down frame and tight into corner.

When the sill jamb junction is reached ensure tape is pressed firmly into corner. Continue removing backing paper and adhering SUPER-STICK across the length of the sill and up the other jamb. Keep tape flush with inside edge of opening and the overhang to the outside of the framing.

At the corner and starting at the front edge of the tape overhang, carefully cut the tape back towards the framing stopping 3mm from the opening corner. The remainder of the split release film can now be removed. Fold the overhang onto the face of the framing and smooth firmly into place over the building wrap and corner butterflies. Press the tape down firmly to ensure proper adhesion.

Apply a layer of 75 mm SUPER-STICK over the top of the original flashing tape along the entire length of the sill. Align the tape to the inside face of the sill or alternatively apply a 150 mm by 150 mm square of Super Stick on top of the original flashing tape on the sill, where a nail will penetrate, to provide a fixing seal as per BRANZ Appraisal.

3.21 TOP CORNERS - OVER BUILDING WRAP

Cut two 300mm (for 90mm framing) / 400mm (for 140mm framing) lengths of **SUPER-STICK**. Mark 150mm (for 90mm framing) / 200mm (for 140mm framing) down from the underside of the lintel. Roll up the cut length with the split release film to the outside of the roll. Peel back 50mm of the split release film from the inside edge. Align SUPER-STICK with 150mm (for 90mm framing) / 200mm (for 140mm framing) mark and flush with inside edge of opening. Apply tape up the frame and tight into the corner. Press tape firmly into the corner junction, then continue across the underside of the opening. At the corner and starting at the front edge of the tape overhang, carefully cut the tape back towards the framing stopping 3mm from the opening corner. The rest of the split liner / release film can now be removed.

Fold the overhang onto the face of the framing and smooth firmly into place.

Take the 75mm x 150mm strips of **SUPER-STICK**, remove the backing paper. Adhere diagonally across each corner, overlapping the corner by 3mm to create a seal at the corner junction. Press the overlap tightly into the corner to form a tight bond between the tapes. Smooth all tape firmly into place to maximize adhesion.

3.22 SILL AREA – OVER RIGID AIR BARRIER (RAB)

Install tape over Rigid Air Barrier in accordance with Marshall Innovations Limited **SUPER-STICK** specifications and the Rigid Air Barrier manufacturer's specifications.

3.23 HEAD FLASHING

Install tape to head flashings using **SUPER-STICK** 75mm in accordance with Marshall Innovations Limited **SUPER-STICK** specification and RAB manufacturers specifications.

3.24 RIGID AIR BARRIER - JOINT SEALING

Cut a length of **SUPER-STICK 75** and apply evenly over RAB joint. Smooth all tape firmly into place to enhance adhesion. Only to be used on vertical joints and in accordance with Marshall Innovations Limited **SUPER-STICK** specification and RAB manufacturers specifications.

Installation - One Piece Sill Tape**3.25 ONE PIECE SILL TAPE**

To comply with Marshall Innovations Limited specification for **Marshall Weatherization System, BRANZ Appraisal 591 - One Piece Sill Tape Flexible Flashing**.

3.26 PREPARATION

Ensure all surfaces are clean, dry and free of any foreign matter that may adversely affect adhesion. Do not install tape below -5°C. When used in conjunction with LOSP treated timber, allow solvent to evaporate for a minimum of 7 days prior to application. Extend building wrap/underlay over opening and cut on a 45° angle away from each corner. Fold flaps into opening and secure to the interior face of framing.

3.27 APPLY PROTECTO TAK ADHESIVE PRIMER

Apply Protecto Tak adhesive primer to all surfaces that are to receive One Piece Sill Tape. The primed surface should be tacky when touched and have a light blue colour. The curing time will vary depending on temperature. If the surface loses its tack, re-apply the Tak Spray.

3.28 SILL AREA – OVER BUILDING WRAP

To dress the bottom of the opening, cut One Piece Sill Tape to the opening plus sufficient length to return up either side of the opening 150mm. Keep the tape flush with the interior face of the opening, and ensure that the exposed timber framing is covered. Remove the release film from the back face of the tape and fold the exposed face into the frame. Prior to pressing the tape onto the front face of the wall underlay, fold back the outer branded face, exposing the front face of the tape. Press the tape onto the outer face of the wall underlay. Fold the branded front face flap forward, cut at the corner, and press onto the exposure front face of the tape.

3.29 TOP CORNERS - OVER BUILDING WRAP

For the top corners of the opening, install a 300mm length of One Piece Sill Tape, 150mm down the jamb and 150mm across the lintel. Keep the tape flush with the interior face of the opening, and ensure that the exposed timber framing is covered. Remove the release film from the back face of the tape and fold the exposed face into the frame. Prior to pressing the tape onto the front face of the wall underlay, fold back the outer branded face, exposing the front face of the tape. Press the tape onto the outer face of the wall underlay. Fold the branded front face flap forward, cut at the corner, and press onto the exposure front face of the tape.

Installation - Protecto Sill Window Sealing System**3.30 PROTECTO SILL WINDOW SEALING SYSTEM**

To comply with Marshall Innovations Limited specification for **Marshall Weatherization System, BRANZ Appraisal 444 - Protecto Sill Window Sealing System**.

3.31 PROTECTO WRAP DETAIL AND SILL TAPES GENERALLY

To avoid wastage, the tape can be lapped 100mm minimum onto itself without reducing the performance of the Protecto Sill System.

3.32 PREPARATION

Ensure all surfaces are clean, dry and free of any foreign matter that may adversely affect adhesion. Do not install tape below -6°C. When used in conjunction with LOSP treated timber, allow solvent to evaporate for a minimum of 7 days prior to application. Extend building wrap/underlay over opening and cut on a 45° angle away from each corner. Fold flaps into opening and secure to the interior face of framing.

3.33 APPLY PROTECTO TAK ADHESIVE PRIMER

Spray Protecto Tak adhesive primer to all surfaces prior to the application of Protecto Wrap Detail Tape and Protecto Sill Tape. The primed surface should be tacky when touched and have light blue colour. The curing time will vary depending on temperature. If the surface loses its tack, re-apply the Tak Spray.

3.34 APPLY PROTECTO WRAP DETAIL TAPE

Install a 300mm length of Protecto Wrap Detail Tape around all four corners of the opening, keeping the tape flush with the interior face of the opening and ensuring the exposed timber framing is covered. After removing the protective film, mould the tape that overhangs the front of the opening onto the face of the building wrap to create an airtight seal at the framing junction.

3.35 APPLY PROTECTO WRAP SILL TAPE - SILL AREA

Cut individual lengths of Protecto Wrap Sill Tape to suit the sill opening. Install tape flush with the interior face of the opening, and apply along the entire length of the sill. Fold the overhanging tape onto the face of the building underlay.

3.36 APPLY PROTECTO WRAP SILL TAPE - JAMBS

Cut two 300mm lengths of Protecto Wrap Sill Tape for the jambs. Install the tape flush with the interior face of the opening and tight into the sill/jamb junction. Fold the overhanging tape onto the face of the building underlay.

Completion**3.37 COMPLETION MATTERS**

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.38 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

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4 SELECTIONS

4161T KINGSPAN THERMAKRAFT UNDERLAYS, FOILS, DPC, DPM, & TAPES

1 GENERAL

This section relates to the application of Kingspan Insulation NZ Ltd, DPC, DPM, Wall & Roof Underlays, Foils, Flashing Tapes, and accessories.

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:

NZMRM New Zealand Metal Roofing Manufacturers Inc.

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 C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
AS 3566.2	Self-drilling screws for the building and construction industries - Corrosion resistance requirements
NZS 3604	Timber-framed buildings
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

[BRANZ Appraisal 943](#) - Thermakraft Covertex 401™ Roof Underlay

[Code Mark Certificate 30069](#) - Thermakraft Covertex 403™ Absorbent Breathable Roof Underlay

[Code Mark Certificate 30030](#) - Thermakraft Covertex 405™ Absorbent Breathable Roof Underlay

[Code Mark Certificate 30028](#) - Thermakraft Covertex 407™ Absorbent Breathable Roof Underlay

Manufacturer/supplier contact details

Company: Kingspan Insulation Ltd

Web: www.thermakraft.co.nz

Email: technical@kingspaminsulation.co.nz

Telephone: 0800 806 595

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For Kingspan Thermakraft product range.

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Roof underlays

2.1 THERMAKRAFT 215™ BITUMINOUS ROOF UNDERLAY

Thermakraft 215™, bituminous self-supporting roof underlay to [NZS 2295](#).

Accessories

2.2 AUSNET™ HEXAGONAL WIRE UNDERLAY SUPPORT NETTING

Thermakraft Ausnet™ 50mm and 75mm galvanized hexagonal wire netting to [AS/NZS 4534](#). Refer to [BRANZ Appraisal 1029](#)

2.3 PREMIUM JOINING TAPE™

Thermakraft Premium Joining Tape™, an acrylic, reinforced tape with superior adhesion and tear resistance used to join laps of wall and roof underlays, plywood rigid underlay, OSB board, fibre cement and insulation panels, DPM and vapour control products such as foil underlays. Maximum exposure 180 days, install from -10°C. Compatibility of the substrate with Premium Joining Tape must be checked by the designer or the installer prior to use.

BRANZ Appraised and approved for use with the James Hardie™ RAB™ Board system, refer to [BRANZ Appraisal 611](#). Not to be used as a flashing tape.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

Design application and installation of Thermakraft Building products to [NZBC E2/AS1](#), BRANZ Appraisals, Thermakraft Technical Literature and Industry Codes of Practice.

Application - roof underlay

3.2 HEXAGONAL WIRE MESH

Run Thermakraft Ausnet™ hexagonal wire mesh continuously across roof rafters, top truss chords or purlins and fix in place with 25mm long stainless steel staples, galvanized flathead clouts or fencing batten staples into timber framing, and class 4 (to AS 3566.2) stainless steel self-tapping screws into steel framing, with 10mm minimum penetration. The installation direction of Ausnet hexagonal wire mesh must be the same as the underlay direction.

3.3 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixings. Lay underlay to avoid excessive dishing between purlins. When used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without wire mesh support. Horizontally lay across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations and avoid prolonged exposure by installing the roof immediately. UV exposure is a maximum of 7 days.

Application - Drainage mat

3.4 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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

4231HL JAMES HARDIE® LINEA™ WEATHERBOARD CLADDING

1 GENERAL

This section relates to the supply and fixing of Linea™ Weatherboard cladding

Documents

1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC E2/VM1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
CodeMark™ GM-CM30018 James Hardie® Linea™ Weatherboard Direct fixed and Cavity Cladding	

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:

Linea™ Weatherboard Technical Specification

James Hardie® Technical Supplement - James Hardie® Claddings Installation to Steel Framing

Fire and Acoustic Design Manual by James Hardie®

Bracing Design Manual by James Hardie®

James Hardie® Installation Checklist

[BRANZ Appraisal 446](#) - Linea™ Weatherboard Direct Fixed Cladding

[BRANZ Appraisal 447](#) - Linea™ Weatherboard Cavity Cladding

Manufacturer/supplier contact details

Company: James Hardie New Zealand Limited

Web: www.jameshardie.co.nz

Email: info@jameshardie.co.nz

Telephone: Ask James Hardie™ on 0800 808 868

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years: For Linea™ Weatherboard product (refer to James Hardie® product warranty)

15 year: For accessories supplied by James Hardie® (refer to James Hardie® product warranty)

From: Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
Linea™ Weatherboard Care and Maintenance guide
Provide this information prior to practical completion.

1.8 CODEMARK CERTIFICATE

James Hardie® Linea™ Weatherboard meets the requirements of the NZBC when used within the Conditions and Limitations of its Certificate of conformity [GM-CM30018](#)

Performance - wind

1.9 PERFORMANCE, WIND

The design wind zones are to [NZS 3604](#), up to and including Extra High Wind Zone. James Hardie® Technical Specifications are suitable for these conditions.

2 PRODUCTS

2.1 SPECIFIC DESIGN, WIND

The design wind pressures are to [AS/NZS 1170.2](#), for specific design wind pressures up to 3.2kPa, as per James Hardie® design details included in the Technical Specification.

Materials

2.2 LINEA™ WEATHERBOARDS

Linea™ Weatherboards, bevel back, 16mm thick, pre-primed, manufactured to [AS/NZS 2908.2](#) from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving.
Tested to the requirements of [NZBC E2/VM1](#) for weathertightness and complying with the NZBC.

2.3 RIGID AIR BARRIERS

Refer to section 4171HR JAMES HARDIE® RIGID AIR BARRIERS.

2.4 WALL UNDERLAY

For flexible wall underlays and rigid wall underlays, refer to the appropriate separate section(s).

2.5 THERMAL BREAK BATTEN

For thermal break battens, refer to the appropriate separate steel framing sections(s).

2.6 TIMBER CAVITY BATTENS

Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To [NZS 3602](#), Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

Components

2.7 SOAKERS

External metal corner soaker. Refer to SELECTIONS.

2.8 EXTERNAL SLIMLINE BOX CORNER MOULD

Etched primed aluminium extrusion with box section.

2.9 BOX CORNER "Z" FLASHING

uPVC profiled 'Z' flashing.

2.10 INTERNAL "W" MOULD 90

Etched primed aluminium extrusion.

2.11 INTERNAL "W" MOULD 135

Etched primed aluminium extrusion.

2.12 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated PVC, with upstands.

2.13 HARDIE™ CORNER UNDER FLASHING

50 x 50mm PVC moulding.

2.14 HARDIE™ AXENT™ TRIM

19mm thick pre-primed fibre cement trim.

2.15 CANT STRIP

Cant strip, uPVC profiled strip.

2.16 FILL

ADOS CRC Builders fill, two part exterior grade fill to finish over jolt head nails.

2.17 ADHESIVE SEALANT

Sikaflex 11FC for jointing weatherboards at external mitred corners only.

2.18 FLEXIBLE SEALANT

Bostik Seal N Flex-1 or Sikaflex AT Facade or Sikaflex MS sealant for tongue and groove joint at ends of Linea™ Weatherboards.

2.19 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to [NZS 3604](#), section 4, **Durability**, for requirements for fixing's material to be used in relation to the exposure conditions.

Refer to [NZBC E2/AS1](#), Table 20, Material selection, and [NZBC E2/AS1](#), Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Fixings Material
Zone D, Zone E / Microclimates (incl. Geothermal)	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized
Bracing - All zones	Grade 316 Stainless

Check against SED (specific engineering design) requirements for microclimate conditions. For fastener type refer to following clause(s).

2.20 STAINLESS STEEL CONCEALED NAILING OVER FLEXIBLE UNDERLAY

Grade 316 stainless, 40 x 2.8mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over flexible underlay into timber stud.

2.21 GALVANIZED STEEL CONCEALED NAILING OVER FLEXIBLE UNDERLAY

Hot-dipped galvanized, 40 x 2.8mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over flexible underlay into timber stud.

2.22 STAINLESS STEEL FACE NAILING OVER FLEXIBLE UNDERLAY

Grade 316 stainless, 60 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over flexible underlay into timber stud.

2.23 GALVANIZED STEEL FACE NAILING OVER FLEXIBLE UNDERLAY

Hot-dipped galvanized, 60 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over flexible underlay into timber stud.

2.24 STAINLESS STEEL CONCEALED NAILING OVER RIGID AIR BARRIER

Grade 316 stainless, 50 x 2.8mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over rigid air barrier into timber stud.

2.25 GALVANIZED STEEL CONCEALED NAILING OVER RIGID AIR BARRIER

Hot-dipped galvanized, 50 x 2.8mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over rigid air barrier into timber stud.

2.26 STAINLESS STEEL FACE NAILING OVER RIGID AIR BARRIER

Grade 316 stainless, 75 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over rigid air barrier into timber stud.

2.27 GALVANIZED STEEL FACE NAILING OVER RIGID AIR BARRIER

Hot-dipped galvanized, 75 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over rigid air barrier into timber stud.

2.28 STAINLESS STEEL CONCEALED NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Grade 316 stainless, 60 x 3.15mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over cavity battens over flexible underlay into timber stud.

2.29 GALV STEEL CONCEALED NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Hot-dipped galvanized, 60 x 3.15mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over cavity battens over flexible underlay into timber stud.

2.30 STAINLESS STEEL FACE NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Grade 316 stainless, 75 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over flexible underlay into timber stud.

2.31 GALV STEEL FACE NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Hot-dipped galvanized, 75 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over flexible underlay into timber stud.

2.32 STAINLESS STEEL CONCEALED NAILING OVER BATTENS & RIGID AIR BARRIER

Grade 316 stainless, 75 x 3.15mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over cavity battens over rigid air barrier into timber stud.

2.33 GALVANIZED STEEL CONCEALED NAILING OVER BATTENS & RIGID AIR BARRIER

Hot-dipped galvanized, 75 x 3.15mm Hardie™ Flex nails for Linea™ Weatherboard concealed nailing over cavity battens over rigid air barrier into timber stud.

2.34 STAINLESS STEEL FACE NAILING OVER BATTENS & RIGID AIR BARRIER

Grade 316 stainless, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.35 GALVANIZED STEEL FACE NAILING OVER BATTENS & RIGID AIR BARRIER

Hot-dipped galvanized, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.36 STAINLESS STEEL FACE NAILING - EH WIND ZONE

Grade 316 stainless, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.37 GALVANIZED STEEL FACE NAILING - EH WIND ZONE

Hot-dipped galvanized, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.38 STAINLESS STEEL FACE NAILING - SED PROJECTS

Grade 316 stainless, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.39 GALVANIZED STEEL FACE NAILING - SED PROJECTS

Hot-dipped galvanized, 90 x 3.55mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over rigid air barrier into timber stud.

2.40 NAILING FOR HARDIE™ AXENT™ TRIM OVER DIRECT FIX LINEA™ WEATHERBOARD 75 x 3.15mm jolt head nails at 400mm centres staggered nailing (with pre-drilling).

2.41 NAILING FOR HARDIE™ AXENT™ TRIM OVER CAVITY FIX LINEA™ WEATHERBOARD 90 x 3.55mm jolt head nails at 400mm centres staggered nailing (with pre-drilling).

2.42 FASTENER TYPE TO STEEL FRAME

Fasteners to minimum durability requirements of the NZBC.

Refer to [NZBC E2/AS1](#), Table 20, Material selection, and [NZBC E2/AS1](#), Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Coating Required
Zone D and Sea Spray Zone or Geothermal Areas	Class-4
Zone B, Zone C	Class-3

Check against SED (specific engineering design) requirements for microclimate conditions. For fastener type refer to following clause(s).

- 2.43 CLASS-4 CONCEALED SCREW FIXING - DIRECT FIX
8-10g x 40mm self embedding steel wingtek screw (class-4) for concealed fixing of Linea™ Weatherboard over flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.44 CLASS-3 CONCEALED SCREW FIXING - DIRECT FIX
8-10g x 40mm self embedding steel wingtek screw (class-3) for concealed fixing of Linea™ Weatherboard over flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.45 CLASS-3 FACE SCREW FIXING - DIRECT FIX
8-10g x 60mm self embedding steel wingtek screw (class-3) for fixing Linea™ Weatherboard over flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.46 CLASS-4 FACE SCREW FIXING - DIRECT FIX
8-10g x 60mm self embedding steel wingtek screw (class-4) for face fixing Linea™ Weatherboard over flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.47 CLASS-3 CAVITY BATTEN SCREW FIXING TO STEEL STUD
45 - 50mm x 8 - 10g wingtek screw (class-3) for 19mm thick timber cavity batten fixing over flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.48 CLASS-4 CONCEALED SCREW FIXING - CAVITY FIX
8-10g x 60mm self embedding steel wingtek screw (class-4) for concealed fixing of Linea™ Weatherboard over 19mm thick timber cavity battens, flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.49 CLASS-3 CONCEALED SCREW FIXING - CAVITY FIX
8-10g x 60mm self embedding steel wingtek screw (class-3) for concealed fixing of Linea™ Weatherboard over 19mm thick timber cavity battens, flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.50 CLASS-4 FACE SCREW FIXING - CAVITY FIX
8-10g x 75mm self embedding steel wingtek screw (class-4) for face fixing Linea™ Weatherboard over 19mm thick timber cavity battens, flexible underlay and 10mm thick thermal break battens into steel framing.
- 2.51 CLASS-3 FACE SCREW FIXING - CAVITY FIX
8-10g x 75mm self embedding steel wingtek screw (class-3) for face fixing Linea™ Weatherboard over 19mm thick timber cavity battens, flexible underlay and 10mm thick thermal break battens into steel framing.

Accessories

- 2.52 SEALANT
Silaflex AT-Facade sealant.

3 EXECUTION

Conditions

- 3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
- 3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.
- 3.3 SUBSTRATE - TIMBER FRAMING
Do not commence work until the substrate is of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by [NZS 3602](#) to minimise shrinkage and movement after weatherboards are fixed.

Application - particular installations

3.4 FIRE RESISTANCE RATING

Refer to project drawings for FRR system construction details and Fire and Acoustic Design Manual by James Hardie® for further information.

Application - generally

3.5 INSTALL CAVITY BATTENS

Install 18mm minimum thick cavity battens to [NZBC E2/AS1: 9.0 Wall claddings](#), where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.6 PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

3.7 INSTALL LINEA™ WEATHERBOARDS

Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Prime site cut ends that are exposed prior to installation. Fit internal corners and fix weatherboards as per Linea™ Weatherboard technical specifications. Fit and fix external corners and flexible sealant to tongue and groove joints as required.

Completion & Commissioning

3.8 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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

4231HO JAMES HARDIE® OBLIQUE™ WEATHERBOARD CLADDING

1 GENERAL

This section relates to the supply and fixing of Oblique™ Weatherboard cladding.

1.1 RELATED WORK

Refer to ~ for ~

Refer to painting section(s) for the protective coating required to meet the NZBC durability requirements.

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:

FRR	Fire resistance rating
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Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC E2/VM1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind loads
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings

CodeMark™ GM-CM30147 James Hardie® Oblique™ Weatherboard Cavity Cladding

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Oblique™ Weatherboard Horizontal Installation Technical Specification

Oblique™ Weatherboard Vertical Installation Technical Specification

Oblique™ Weatherboard Vertical Installation to Hardie™ 40mm Structural Horizontal Cavity Batten Technical Specification

Fire and Acoustic Design Manual by James Hardie®

James Hardie® Installation Checklist

BRANZ Appraisal 1231 - Oblique™ Weatherboard (Horizontal) Cavity Cladding

BRANZ Appraisal 1232 - Oblique™ Weatherboard (Vertical) Cavity Cladding

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	0800 808 868

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years	For Oblique™ Weatherboard products (refer to James Hardie® product warranty)
15 years	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of purchase (check with the manufacturer/supplier).

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
Oblique™ Weatherboard Care and Maintenance guide.

Provide this information prior to practical completion.

1.10 OBLIQUE™ WEATHERBOARD INSTALLATION CHECKLIST

Installer to complete, sign and provide a James Hardie® Installation Checklist.

Compliance information

1.11 CODEMARK CERTIFICATE

James Hardie® Oblique™ Weatherboard meets the requirements of the NZBC when used within the Conditions and Limitations of its Certificate of conformity GM-CM30147

Performance - wind

1.12 PERFORMANCE, WIND

The design wind zones are to [NZS 3604](#), up to and including Extra High Wind Zone. James Hardie® Technical Specifications are suitable for these conditions.

Performance - fire

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIALS

James Hardie® Oblique™ Weatherboard cladding tested to [AS/NZS 3837](#) and to specific requirements of C/AS1 or C/AS2 achieving Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

2 PRODUCTS

Materials

2.1 OBLIQUE™ WEATHERBOARDS

Oblique™ Weatherboards, rusticated profile, 14mm thick, pre-primed, manufactured to [AS/NZS 2908.2](#) from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving. Tested to the requirements of [NZBC E2/VM1](#) for weathertightness and complying with the NZBC.

2.2 RIGID AIR BARRIERS

Refer to section 4171HR JAMES HARDIE® RIGID AIR BARRIERS.

2.3 WALL UNDERLAY

For flexible wall underlays and rigid wall underlays, refer to the appropriate separate section(s).

2.4 TIMBER CAVITY BATTENS

Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To [NZS 3602](#), Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.5 HARDIE™ 20MM HORIZONTAL CAVITY BATTEN

Proprietary profiled radiata pine battens, minimum 45mm wide x 20mm thick, H3.1 treated to [NZS 3602](#), Table 1, reference 1D.10. Bevelled top edge with offset grooved rebates at the front and back faces to allow for drainage and ventilation. Requirements for wood-based building components to achieve a 50-year durability performance.

2.6 20MM VENT STRIP/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.7 HARDIE™ 14MM ALUMINIUM JAMB FLASHING

Aluminium moulding used beside window opening to end butt the Oblique™ Weatherboard.

2.8 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

Aluminium flashing extrusion used behind cladding joints.

2.9 TRIMLINE JOINTERS

Aluminium jointers to joint Oblique™ Trimline Joint Flashings at flashing ends, external corners and internal corners.

2.10 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to [NZS 3604](#), section 4, **Durability**, for requirements for fixing's material to be used in relation to the exposure conditions.

Refer to [NZBC E2/AS1](#), Table 20, Material selection, and [NZBC E2/AS1](#), Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Fixings Material
Zone D, Zone E / Microclimates (incl. Geothermal)	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized

Check against SED requirements for microclimate conditions. For fastener type refer to following clause(s).

2.11 CAVITY BATTEN NAILS

40 x 2.8mm Hardie™ Flex nails for fixing timber cavity battens and aluminium flashings.

2.12 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over cavity battens over flexible underlay.

2.13 GRADE 316 STAINLESS STEEL NAILS

Grade 316 stainless, 65 x 2.87mm D head or 65 x 2.87mm RounDrive steel ring shank nails for fixing Oblique™ Weatherboards over cavity battens over flexible underlay.

2.14 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over battens over rigid air barrier.

2.15 GRADE 316 STAINLESS STEEL NAILS

Grade 316 stainless, 75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over battens over rigid air barrier.

2.16 FLEXIBLE SEALANT

Bostik® Seal N Flex-1™ or Sikaflex® AT Facade or Sikaflex® MS sealants.

2.17 PRIMER

Refer to SELECTIONS.

2.18 EXTERIOR GRADE FILLER

CRC® ADOS® Builders Fill, two part filler to fill over nail holes.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Do not commence work until the substrate is of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by [NZS 3602](#) to minimise shrinkage and movement after weatherboards are fixed.

Application - particular installations

3.4 FIRE RESISTANCE RATING

Refer to project drawings for FRR system construction details and Fire and Acoustic Design Manual by James Hardie® for further information.

Application - generally

3.5 INSTALL CAVITY BATTENS - OBLIQUE™ HORIZONTAL WEATHERBOARDS

Install 20mm minimum thick cavity battens to [NZBC E2/AS1: 9.0 Wall claddings](#), where required.

Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.6 INSTALL CAVITY BATTENS - OBLIQUE™ VERTICAL WEATHERBOARDS

Install 20mm thick Hardie™ Horizontal Cavity Battens. Fix horizontal cavity battens to wall framing nogs, fix vertically to studs at corners and openings. The battens are fixed by the cladding fixings which will penetrate the wall framing nogs and studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc).

3.7 PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

3.8 INSTALL OBLIQUE™ WEATHERBOARDS - HORIZONTAL INSTALLATION

Cut weatherboards to required lengths for vertical jointing. Prime site cut ends that are exposed prior to installation. Fit vertical jointers, internal and external corners and fix weatherboards as per Oblique™ Weatherboard Horizontal technical specifications.

3.9 INSTALL OBLIQUE™ WEATHERBOARDS - VERTICAL INSTALLATION

Cut weatherboards to required lengths. Prime site cut ends that are exposed prior to installation. Fit joint flashing, internal corners and external corners and fix weatherboards as per Oblique™ Weatherboard Vertical technical specifications.

Completion & Commissioning

3.10 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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

4311M METALCRAFT PROFILED ROOFING

1 GENERAL

This section relates to the supply and fixing of **Metalcraft Roofing** profiled roofing complete with accessories.

It includes:

- Trough section roofing profiles
- Asymmetrical rib roofing profiles
- Corrugated roofing profile
- Translucent roofing

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone
LBP	Licensed Building Practitioner

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire
NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
NZBC G12/AS1	Water supplies
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmosphere - Classification determination and estimation
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Metalcraft Roofing Metdek500 product literature
 Metalcraft Roofing Metdek855 product literature
 Metalcraft Roofing Metrib760 product literature
 Metalcraft Roofing MC770 product literature
 Metalcraft Roofing MC760 product literature
 Metalcraft Roofing T-Rib product literature
 Metalcraft Roofing MC1000 product literature
 Metalcraft Roofing Metcom7 product literature
 Metalcraft Roofing Metcom930 product literature
 Metalcraft Roofing Metcom965 product literature
 Metalcraft Roofing Kahu® product literature
 Metalcraft Roofing Corrugate product literature
 Metalcraft Roofing Alsynite Topglass® product literature
 Eco Choice Aotearoa Ecolabel certificates

Manufacturer/supplier contact details

Company: **Metalcraft Roofing**
 Web: www.metalcraftgroup.co.nz
 Email: technical@metalcraftroofing.co.nz

Telephone: 09 274 0408

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years for failure of coating adhesion

~ years for weatherproofing by material penetration

For Warranty requirements in excess of this contact Metalcraft Roofing.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5years for workmanship

- Provide this warranty on the material manufacturers standard warranty form.
- Commence the warranty from the date of practical completion of the contract works.

Include a copy of the Metalcraft Roofing maintenance requirements with the warranty.
Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS

Roof Installers shall be experienced, competent roofers familiar with Metalcraft products. And for Restricted Building Work shall also be, an LBP or supervised by an LBP.

Carry out work with experienced, competent installers familiar with the products being used and preferably with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

Performance - Wind (design by contractor)

1.9 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

Refer to Metalcraft for "Wind Load Span Design Graphs" for load parameters.

1.10 FIXINGS, WIND

Design and use the fixings/fixing pattern appropriate for the wind design parameters and [NZMRM CoP NZ](#). Refer to Metalcraft profiled roofing product literature for profile details. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

Performance - General

1.11 PERFORMANCE

Install roofing materials in accordance with the [NZMRM CoP](#), and Metalcraft profiled roofing product literature, to form a weather-tight performance for the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

1.12 DRINKING WATER

Roofing for collecting potable water to [NZBC G12/AS1](#).

1.13 CO-ORDINATE

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

2 PRODUCTS

Materials

2.1 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

Fixings

2.2 FASTENERS 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 E2/AS1 and/or the [NZMRM CoP](#) and Metalcraft profiled roofing product literature.

For fixing patterns refer to Metalcraft product literature for roofing profile.

2.3 FIXING CLIPS TO TROUGH SECTION ROOFING - METDEK500

Galvanized steel (powdercoated) to suit the material and the roofing profile and location as required by Metalcraft Roofing for roofing:

- For Metdek500 roofing, fixings for steel are 12 gauge galvanized Wafertek self-drilling screws and for timber 12 gauge galvanized screws or spiral shank nails. Minimum embedment 35mm.

2.4 FIXING CLIPS TO TROUGH SECTION ROOFING - METDEK855

Galvanized steel (powdercoated for aluminium) to suit the material and the roofing profile and location as required by Metalcraft Roofing for roofing:

- For Metdek855 roofing, plastic lugs to be fixed directly to steel using 14 gauge hex head tek screws and for timber use 12 gauge hex screws. Minimum embedment 35mm.

2.5 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metalcraft and with a Class 4 or 5 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.6 RIVETS

Sealed aluminium, minimum diameter 4.0mm. Refer to Metalcraft for requirements..

2.7 FLASHINGS GENERALLY

To [NZBC E2/AS1](#), 4.0, **Flashings**.

Formable grade 0.55 BMT for galvanized, aluminium/zinc, aluminium/zinc/magnesium - coated and pre-painted steel and 0.90 BMT for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

Components

2.8 FLASHINGS TO VERGE, RIDGE AND HIP

To [NZBC E2/AS1](#), 4.0, **Flashings**.

Supplied by the roofing manufacturer to match or to suit the roofing.

2.9 BOOT FLASHINGS

Generally to E2/AS1, 8.4.17 **Roof penetrations** (note; E2/AS1, Figure.54 **Soaker flashing for pipe penetration**, has an error, use as guide only).

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

Accessories

2.10 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.11 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.12 SEALANT

Neutral curing silicone or polymer sealant as required by Metalcraft and used as directed.

2.13 CLOSURE STRIPS

Polyurethane profiled closed cell foam strips to fit the sheet profile.

Brand: Ecofoam

Profile: To suit selected cladding profile

3 EXECUTION

Conditions

3.1 INSPECTION

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could damage the roofing.

3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

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

3.4 HANDLING

Do not drag sheets across each other or other materials. Avoid distortion and contact with damaging substances, including cement. Long lengths of roofing should be lifted onto the roof using an approved load spreading beam. Protect edges and surface finishes from damage, keep under cover and remove as the product is being installed. Use soft, flat sole shoes when fixing and for all other work on the roof. Walk along the purlin line whenever possible.

3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use lead sheet or copper in contact with or allow water run-off onto galvanized or aluminium/zinc coated steel.

Application

3.6 FIX INSULATION

Refer to thermal insulation sections.

3.7 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

3.8 END LAPS

End laps are not recommended, except where specifically detailed.

3.9 THERMAL MOVEMENT

Fix for Thermal Movement to Metalcraft requirements for thermal movement.

3.10 FIXING GENERALLY

Install and fix in accordance with the [NZMRM CoP](#) recommendations, and to Metalcraft required fixing patterns and details for each area of the building roofing. Use only screws as required by Metalcraft. Paint colour matched fixings and accessories before installation.

3.11 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking Zinalume® and Colorsteel®. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.12 FIX SHEETS - CONCEALED CLIP SYSTEM

Fix sheets in place using the clip fixing system required by Metalcraft for roofing profile, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

3.13 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of sheets. Form downturns at the gutter line where the roof pitch is less than 8 degrees. Form using the required tools.

3.14 INSTALL FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Flashings to be installed on timber framing with moisture content of less than 20%. Where no detail is provided flash to [NZMRM CoP](#) recommendations and Metalcraft and [NZBC E2/AS1](#) requirements. Cut accurately and fix using sealant and rivets to detail and to Metalcraft requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.15 USE OF SEALANTS

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

3.16 FLASHING PENETRATIONS

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

Completion

3.17 REPLACE

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

3.18 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.

3.19 REMOVE

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

4 SELECTIONS

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

4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to the fabrication, supply and installation of APL Window Solutions residential window and door systems manufactured by either Altherm, First or Vantage. It includes:

- APL Aluminium windows and doors
- APL Roof windows and overhead glazing
- APL Ventient trickle ventilators
- Hardware and furniture
- Flashings and sealants

1.1 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ
PQAS	Powder Coating Quality Assurance System

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC G4/AS1	Ventilation
NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4303	Ventilation for acceptable indoor air quality
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2604.05	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ ([WGANZ](#)) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1
PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

US Federal Specification:

TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

CodeMark CMNZ10033 (V1)	APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors.
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1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

[Altherm Specifier's Guide](#)

[First Specifier's Guide](#)

[Vantage Specifier's Guide](#)

[APL Specifier Guide to Fluoroset FP - Selling, Fabricating, Handling, Care and Maintenance](#)

[APL Window Energy Efficiency Rating System \(WEERS\) Report Series](#)

[APL Metro Series ThermalHEART® with Centrafix™ System Guide V1, April 2023](#)

[BRANZ Appraisal 1188](#) [2023] - APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors

[BRANZ Appraisal 1259](#) [2024] - APL ThermalHEART+® Window and Door Systems

[Declare Label](#) - Residential Series, Metro Series and APL Architectural Series APL Window Solutions - APL-0001

[APL Window Solutions Environmental Product Declaration v1.1](#)

Summary of [Toitu Carbonreduce](#) Certification for APL Window Solutions Limited's Metro Thermal, Residential Thermal and Commercial Series

Manufacturer/supplier contact details

Company: APL Window Solutions

Web: www.altherm.co.nz
www.firstwindows.co.nz
www.vantage.co.nz
www.aplnz.co.nz

Email: specifiersguide@aplnz.co.nz

Telephone:: 07 849 2113

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For fabrication
2 years:	For hardware

- 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.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	For installation
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- Provide this warranty on the installer/applicator 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

- 1.6 NO SUBSTITUTIONS
Substitutions are not permitted to any specified APL aluminium system, or associated components and products.
- 1.7 QUALIFICATIONS
Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

Compliance Information

- 1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE
Provide the following compliance documentation:
- Manufacturer / supplier warranty
 - Installer / applicator warranty
 - Other information required by the BCA in the Building Consent Approval documents.
- 1.9 COMPLIANCE - CODEMARK CERTIFICATE
APL Metro Series ThermalHEART® with Centrafix™ meets the requirements of the NZBC when used within the Conditions and Limitations of its CodeMark Certificate of Conformity [CMNZ10033](#) (V1).
- 1.10 COMPLIANCE
Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).
- 1.11 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

- 1.12 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.
- 1.13 STRUCTURAL/WEATHER-TIGHTNESS
The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window fabricator.

Performance - Wind

- 1.14 DESIGN PARAMETERS - NON SPECIFIC DESIGN
Design the installation to the wind zone parameters of [NZS 3604](#), table 5.1.
Refer to SELECTIONS for wind zone.

2 PRODUCTS

Materials

- 2.1 ALUMINIUM EXTRUSIONS
Alloy designation to comply with [AS/NZS 1866](#). Branded and extruded for anodising or powder coating.
- 2.2 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
- 2.3 STAINLESS STEEL SHEET AND STRIP
Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.4 GLASS

Refer to the glazing section for glass types and installation.

Flashings

2.5 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 installation - cavity systems

2.6 STANDARD CAVITY CLOSER

A device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with [NZBC E2/AS1](#) to the spaces above the window or door.

2.7 SUPPORT BAR

[WGANZ](#) extruded aluminium support bar with built in drainage and ventilation to [NZBC E2/AS1](#), and support bar location bracket, to provide continuous support to the window unit. Size to suit cladding type.

Components

2.8 GLAZING GASKETS

Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

2.9 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.

2.10 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to [NZBC F4/AS1](#), Section 2.0, Opening windows.

2.11 FIXING BRACKETS

Designed by manufacturer to specific design.

2.12 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-001543A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus ($\pm 25\%$ movement) to US Federal Specification [TT-S-00230C](#).

Accessories

3 EXECUTION

Conditions - generally

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

3.4 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 636 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.

3.5 ADDITIONAL PROTECTION

Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

Assembly

3.6 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.

3.7 HARDWARE GENERALLY

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

3.8 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

3.9 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.

3.10 EXPOSED FIXINGS AND FASTENINGS

Fixings and fastenings exposed to the weather to be aluminium, or Type 304 stainless steel.

3.11 PROTECTED FIXINGS AND FASTENINGS

Fixings and fastenings not exposed to the weather may be hot-dip galvanized steel with a coating weight of 610 g/m² complying with [AS/NZS 4680](#).

3.12 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.

3.13 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 cladding 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).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer
- all in accordance with the shop drawings, where applicable.

3.14 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.15 INSTALLATION CAVITY CONSTRUCTION

Install to [WGANZ Window Installation Guide](#) details and drawings including [WGANZ](#) sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to [NZBC E2/AS1](#), figure 62(d).

3.16 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 plus any jamb scribe width at each end.

3.17 COMPLETE AIR SEAL

To [NZBC E2/AS1:9.1.6](#) Air seals. Form an air-tight seal by means of proprietary expanding foam or sealants used with PEF 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.

3.18 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.19 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window and sealant 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.

3.20 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.

3.21 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.

3.22 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.

3.23 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. Anodised finishes should be protected from cement products and require immediate clean-up of cement splashes. Only use tapes that have passed [WGANZ](#) testing on powder coated products. Remove protection on completion.

3.24 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM

In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted to minor surface scratching. Otherwise replace all damaged material.

3.25 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.

4 SELECTIONS

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

4555 GARAGE DOORS

1 GENERAL

This section relates to the manufacture, supply and installation of garage door systems including required opening/operating systems.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170	Structural design actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3604	Timber-framed buildings
AS/NZS 4505	Garage doors and other large access doors

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Requirements

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

Performance

1.3 DESIGN PARAMETERS WIND

Design the installation to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.4 LOADS - NON - SPECIFIC DESIGN - DOORS UP TO 3.0M HIGH

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind performance requirements to [NZS 3604](#).

1.5 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

2 PRODUCTS

2.1 GARAGE DOOR

Manufacture to [AS/NZS 4505](#) complete with a compliance label.

2.2 MOTORISED DOOR OPENER

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3 EXECUTION

3.1 PREPARATION FOR INSTALLATION

Check that the trimmed and lined openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed.

3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weathertight fit round the entire perimeter.

3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

Completion

3.6 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

3.7 REPLACE

Replace damaged, cracked or marked elements.

3.8 LEAVE

Leave work to the standard required by following procedures.

3.9 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

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:

NZBC B2/AS1	Durability
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1-AS2	Energy Efficiency
NZBC H1/VM1-VM2	Energy Efficiency
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting 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.

Performance

1.4 ENERGY EFFICIENCY

Provide glazing to comply with H1 Energy efficiency requirements of [NZBC H1/AS1-AS2](#) and [NZBC H1/VM1-VM2](#).

2 PRODUCTS

Materials

2.1 LAMINATED GLASS

Grade A Safety Glass to [AS/NZS 2208](#) with PVB or CIP resin interlayer.

2.2 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.

Materials, screens

2.3 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, timber glazing

2.4 PUTTY, TIMBER FRAME

Linseed oil base glazing putty. Not to be used with laminated or IGUs.

2.5 SPRIGS

Diamond metal pieces to retain glass in timber sashes and frames.

2.6 GLAZING TAPE

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes for bead glazing. For internal use only.

2.7 GASKETS

PVC or Santoprene to window manufacturers' requirements.

2.8 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes. Use with bead glazing and for IGUs.

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 636.

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.

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in [NZS 4223.3](#), that also comply with the relevant requirements of [AS/NZS 2208](#). Ensure material is permanently marked and if cut by the distributor or installer mark each piece to [NZS 4223.3](#), 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in [NZS 4223.1](#).

3.11 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

Application - timber glazing

3.15 PREPARE REBATES

Ensure all rebates and grooves are clean, dry and unobstructed at time of priming, sealing and glazing.

3.16 PREPARE TIMBER SURROUNDS

Ensure that all rebates have been primed with a primer suitable for this purpose and applied to the requirements of the painting section/s.

3.17 PREPARE TIMBER BEADS

Before fixing ensure that timber beads are sealed and painted to match the timber surround.

3.18 LOCATE BLOCKS

Centralise the glass in the rebate opening using setting, location and spacer blocks as required in [NZS 4223.1](#), Section 4 Glazing, to prevent movement of glass in the rebate and cushion the effect of wind loading on the sealing system.

3.19 INSTALL PUTTY FRONTING

Back putty to give a bedding of not less than 1mm to 2mm between the glass and the back of the rebate when the glass has been pressed back. Strip off squeezed out putty at a positive angle. Fix glass to wooden surrounds with diamond points or sprigs at maximum 460mm centres. Fix glass to metal surrounds with spring clips or pins provided by the sash manufacturers. Apply putty to the face to form a triangular fillet stopping 1-2 mm below sight line. Finish putty smooth and true to line and face and with a light brushing.

Leave all windows and doors closed until putty has set sufficiently to prevent glass displacement.

Prime putty fronting once surface has skinned - normally within 10 - 15 days of completion of glazing, but this can be reduced with special XHP putty.

3.20 BEAD GLAZING, PREFORMED STRIPS

Apply the preformed tape to the rebate upstand with securely formed (or sealed) butt joints at corners. Place setting blocks, offer the glass and press back against the tape centralised in the opening and apply the second tape. Press the beads against and compressing the tapes and fix true to line and face sufficiently rigid to prevent flexing or movement. Trim off excess strip.

If a capping bead is required clean and paint the timber surface and when dry apply sealant capping between bead and glass and tool to a smooth camber.

3.21 BEAD GLAZING, NON SETTING COMPOUNDS

Apply compound to the rebate. Push setting blocks into place with distance pieces against the rebate upstand before offering the glass to the surround on setting blocks, centralised in the opening and pushed back into the glazing compound. Fill all voids with compound and apply more compound before setting distance pieces in it opposite the distance pieces already in place. Bed the beads to the glass and rebate and fix true to line and face sufficiently rigid to prevent flexing or movement. Finish compound off at an angle both sides of the glass.

3.22 INSTALLING INSULATING GLASS UNITS

Refer to the glazing manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to [AS/NZS 4666](#). Fit setting and location blocks and bead glaze units using a compatible sealant to NZS 4666 section 3 Glazing, and to the glazing manufacturer's requirements.

3.23 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

Application miscellaneous**3.24 INSTALL GLASS SHOWER & BATH SCREENS**

Install shower and bath screens and doors to manufacturer's requirements.

Finishing**3.25 SAFETY**

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion**3.26 TRADE CLEAN**

Clean off or remove safety indicators at completion of the building.

3.27 REPLACE

Replace damaged, cracked or marked glass.

3.28 LEAVE

Leave work to the standard required by following procedures.

3.29 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4710P PINK® BATTS® THERMAL & ACOUSTIC INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions™ Pink® Batts® thermal and acoustic insulation materials for walls, floors, ceilings and roofs.

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:

IIC	Impact Insulation Class
STC	Sound Transmission Class

1.2 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting, wall underlays and roofing underlays

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
NZBC G6/AS1	Airborne and impact sound
NZBC G6/VM1	Airborne and impact sound
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/ New Zealand Wiring Rules)
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Comfortech H1. Done - Insulation Guide
 Comfortech Pink® Batts® Insulation - Safety Data Sheet.
 Comfortech Pink® Batts® Thermal Solutions - Product Guide
 Comfortech Pink® Superbatts® Thermal Solutions - Installation Guide
 Comfortech Pink® Batts® - Product Data Sheets
 Comfortech Pink® Batts® - Installation Instructions
[BRANZ Appraisal 238](#) - Pink® Batts® Insulation
[BRANZ Appraisal 632](#) - Pink® Batts® SnugFloor® Insulation
[BRANZ Appraisal 767](#) - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company: Tasman Insulation NZ Ltd
 Trading as: Comfortech Building Performance Solutions™
 Web: www.pinkbatts.co.nz
 Telephone: 0800 746 522

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For Pink® Batts® thermal insulation products
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- Provide this warranty on the manufacturer/ supplier standard form (if not available then use

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Compliance information

1.8 BRANZ APPRAISAL

Pink® Batts® Insulation meets the requirements of the NZBC when used in accordance with the conditions and limitations listed in the following Branz Appraisal:

[BRANZ Appraisal 238](#) - Pink® Batts® Insulation

[BRANZ Appraisal 632](#) - Pink® Batts® SnugFloor® Insulation

[BRANZ Appraisal 767](#) - Pink® Batts® Skillion Roof Insulation

Performance - Fire

1.9 FIRE PROPERTIES - NON COMBUSTIBLE

Pink® Batts® insulation products, with the exception of Pink® Batts® R2.6 Wall Insulation and Pink® Batts® R2.8 Wall Insulation products, are classified as non-combustible when tested to [NZS/AS 1530.1](#) and achieve a Group Number of 1-S.

2 PRODUCTS

2.1 FIRE HAZARD TESTING

Pink® Batts® insulation products withstand the 30s Needle Flame test in accordance with [AS/NZS 60695.11.5](#), that is required for insulation abutting or covering recessed downlights intended to be in contact with IC, CA 80, CA 135 luminaires.

Materials - thermal insulation

2.2 PINK® BATTS® WALL INSULATION

Pink® Batts® Wall Insulation (Pink® Batts® Classic, Pink® Batts® Narrow, Pink® Batts® Ultra®, Pink® Batts® Ultra® 140mm Wall, Pink® Batts® Ultra® 140mm Narrow Wall) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

2.3 PINK® BATTS® CEILING INSULATION

Pink® Batts® Ceiling Insulation (Pink® Batts® Classic, Pink® Batts® Ultra® and Pink® Superbatts®) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

2.4 PINK® BATTS® SKILLION ROOF INSULATION

Pink® Batts® Skillion Roof Insulation (Pink® Batts® Skillion Roof and Pink® Superbatts®) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

Components

2.5 FASTENERS

Insulation anchors complete with retaining washer.

2.6 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.7 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape, stapled over framing to retain insulation in unlined wall and ceiling locations.

2.8 ADHESIVE TAPE

Pressure sensitive adhesive tape.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Check that framing is free from moisture. Check cavities are not interconnected. Check required wire netting, roof/ underlays are in place and are dry, clean and homogeneous before installing insulation. Ensure main power is isolated and tagged prior to installation.

3.4 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Refer to Pink® Batts® Insulation - Safety Data Sheet.

Installation - general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALL THERMAL INSULATION - GENERALLY

Install Pink® Batts® insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to [NZBC H1/AS1-AS2](#) and Pink® Batts® installation requirements. For all housing and buildings up to 300m², install in accordance to [NZS 4246](#) sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. Insulate around vents (not over them) to allow unhindered ventilation. Confirm with fireplace manufacturer for clearances; Pink® Batts® insulation is non-combustible and 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.

3.7 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to [AS/NZS 3000](#), 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F & IC-4

3.8 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/ roof joists (under purlins). Pull tight and fix.

3.9 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips.

3.10 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.11 PREPARATION

Before installation, gently agitate the insulation by gentle shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Ensure the product is installed dry.

Completion

3.12 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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

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
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing 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:

NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	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 which refer to work in this section:

GIB® Site Guide (September 2018)
 GIB® Noise Control Systems (September 2017)
 GIB® Fire Rated Systems (October 2018)
 GIB® Wet Area Systems (April 2021)
 GIB Toughline® Aqua (July 2018)
 GIB Ezybrace® Systems (August 2016)
 GIB Ezybrace® Bracing Design Software
 GIB Ezybrace® Bracing Supplement Document (December 2016)
 GIB Ezybrace® for Light Steel Frame Systems (March 2017)
 GIBFix® Framing System (August 2016)
 GIB Rondo® Metal Batten System (August 2012)
 GIB-Cove®
 GIB RocTape®
 GIB® Goldline™ Platinum Tape-on Trims
 GIB® UltraFlex high impact corner mould
 GIB® Tough Systems (November 2014)
 BRANZ Appraisal 289 GIB® Fire Rated Systems
 BRANZ Appraisal 394 GIB® Noise Control Systems

BRANZ Appraisal 427 GIB® Wet Area Systems
 BRANZ Appraisal 928 GIB EzyBrace® Systems
 BRANZ Appraisal 940 GIB® Intertenancy Barrier Systems for Terrace Homes

GreenTag Certification [WWL:G102:2021:GR](#) - GreenTag™ GreenRate Level A for:
 GIB® Standard (10mm & 13mm)
 GIB Fyreline® (10mm, 13mm, 16mm & 19mm)
 GIB Braceline® (10mm & 13mm)
 GIB Noiseline® (10mm & 13mm)
 GIB Toughline® (13mm)
 GIB Wideline® (10mm & 13mm)

GreenTag Certification [WWL:G103:2021:GR](#) - GreenTag™ GreenRate Level C for:
 GIB Ultraline® (10mm & 13mm)

Manufacturer/supplier contact details
 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 Design Software
- GIB Ezybrace® Bracing Supplement Document (December 2016)
- GIB Ezybrace® for Steel Frame Housing (NASH) Software 2011 (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

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 Wideline® plasterboard

GIB Ultraline® high quality surface plasterboard

GIB Fyreline® fire resistant plasterboard

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

GIB Aqualine® wet area plasterboard

GIB Toughline®

GIB Toughline® Aqua

Components

2.2 CEILING BATTENS

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

2.3 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.

2.4 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould

GIB® Levelline® Tape on Trim

2.5 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims

GIB® plastic W-profile control joints.

Accessories

2.7 ADHESIVE

Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive

GIBFix® All-Bond solvent based wallboard adhesive

2.8 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

2.9 JOINTING TAPE

GIB® jointing tape.

2.10 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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 (September 2018).

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 (Sept 2018).

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 (Sept 2018).

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 (September 2018). 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)

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide (September 2018) requirements.

3.13 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and [AS/NZS 2589](#).

Completion & Commissioning

3.15 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

4.1 GIB® BRACING SYSTEMS

Refer to:

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

For bracing element location refer to drawn documentation.

5230 INTERIOR DOORS

1 GENERAL

This section relates to the supply and installation of interior doors.

1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

1.2 DOCUMENTS

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

[NZS 3602](#) Timber and wood-based products for use in building
[NZS 3610](#) Specification form profiles of mouldings and joinery

2 PRODUCTS

2.1 TIMBER

To [NZS 3602](#).

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to [NZS 3610](#). Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

2.3 DOORS, TIMBER VENEER

Doors as scheduled complete with matching 6mm clashing strip to both sides and to the exposed edge of cavity slider doors.

2.4 DOORS, PAINTED

Doors as scheduled (without clashing strips).

2.5 CAVITY SLIDERS

Doors hung within a proprietary cavity slider frame and complete with brand-matched sliding door gear.

2.6 FRAMED AND GLAZED DOORS

Solid timber framed doors, stop end jointed and bead glazed.

2.7 FRAMED AND PANELLED DOORS

Solid timber framed doors, stop end jointed and beaded as detailed.

2.8 FRAMED AND LOUVRED DOORS

Solid timber framed doors, stop end jointed and beaded as detailed.

2.9 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

2.10 SLIDING DOOR GEAR

To suit door/sash size and glazed weight and as detailed.

2.11 SLIDING-FOLDING DOOR GEAR

Bi-fold pattern to suit size and weight of doors and as detailed.

3 EXECUTION

3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

3.2 EXECUTION GENERALLY

Manufacture to the 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).

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -

- Hinges

3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

Internal doors

3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

3.6 DOOR FRAMES, SOLID REBATED

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.7 DOOR LINERS

Heads and jambs finished minimum 18mm, with 10mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.8 DOOR LINERS, EXTENDED

Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.9 CAVITY SLIDERS

Install in accordance with the door manufacturer's requirements, allowing for removal of top trim for maintenance.

Completion

3.10 CHECK

Check and adjust operation of all sashes, doors, hardware and furniture.

3.11 TEMPORARY PROTECTION

On completion remove any temporary protection and leave ready for following work.

4 SELECTIONS

6411 VINYL SURFACING

1 GENERAL

This section relates to the supply and installation of vinyl surfacing including skirtings, nosings, trims and edges.

It includes:

- PVC sheet
- PVC tiles

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC D1/AS1	Access routes
NZS/AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years: For materials

- 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.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years: For execution

- Provide this warranty on the installer/applicator 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

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

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

Performance

1.6 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

2 PRODUCTS

Materials

2.1 VINYL SHEET

High vinyl content homogeneous monolayer flexible PVC sheet flooring.

2.2 VINYL TILES

High vinyl content monolayer flexible PVC tiles.

2.3 COVINGS

Commercial applications: Pencil cove with butterfly mitres to all external and internal corners. Fillet cove for safety flooring.

Domestic applications: Pencil or fillet cove method.

2.4 VINYL SHEET WALL COVERING

High vinyl content homogenous flexible PVC sheet wall covering.

2.5 WALL AND FLOOR VINYL JOINING STRIP

White PVC floor to wall finishing strip.

2.6 TRIMS AND EDGING

PVC as supplied by the sheet manufacturer to complete the work.

Accessories

2.7 ADHESIVE

Standard acrylic adhesive to suit the material and substrate and to the vinyl manufacturer's requirements.

2.8 PRIMER AND SEALER

To the adhesive manufacturer's requirements for the particular substrate.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Maintain rolls of sheet, packages of tiles and accessories undamaged and dry. Store rolls upright with other material on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.

Avoid distortion, stretching, marking and damage to edges while shifting, unrolling and handling sheet, tiles and accessories.

3.2 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.3 LAYING GENERALLY

Carry out the whole of the work to [NZS/AS 1884](#), and to the flooring manufacturer's requirements.

3.4 LAYOUT

Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

Application - General / substrate preparation

3.5 PREPARATION NEW CONCRETE

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust.

3.6 PREPARATION, NEW PLYWOOD OR PARTICLEBOARD

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind smooth, then vacuum to remove all dust.

3.7 PREPARATION FOR WALL LININGS

Prepare wall linings to requirements of wall lining manufacturer and vinyl manufacturer, for vinyl over.

Application - laying

3.8 PREPARATION

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for conditioning of rolls and the working temperatures and conditions before, during and after laying. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side, of the work period.

3.9 ADHESIVE APPLICATION

Apply approved adhesive as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

3.10 LAYING VINYL SHEET

Roll out, cut, leave to condition and install sheet vinyl to the vinyl manufacturer's requirements. Ensure there are no air bubbles or twisting, that the seams are kept clear of adhesive, and immediately the sheet is adhered roll with a 68 kg roller.

3.11 CROSS JOINS

Plan and allow cuts to avoid cross joins. Obtain written approval of the owner before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.

3.12 COVE VINYL

Pencil cove flooring to the specified height and finish off as detailed.

3.13 MITRES

Perform butterfly method to internal and external mitres. Thermo-weld all mitres.

3.14 LAYING VINYL TILES

Set out from the centre of the area in two preparatory runs and modify to suit before laying tiles from the centre to the vinyl manufacturer's requirements. Ensure air is expelled and, as each section is completed, immediately roll with a 68 kg roller. Complete sections before scribing the perimeter tiles.

3.15 FIT VINYL SKIRTING

Fit skirting in accordance with the skirting manufacturer's requirements.

3.16 FIT VINYL EDGING

Fit tapered vinyl edging to all borders, except where abutting carpet.

3.17 WALL SURFACES

Clean off surface contamination, carry out minor repairs and bring to a smooth, even surface.

3.18 APPLY PRIMER OR SEALER FOR VINYL SHEET

Prime and/or seal porous plaster, concrete and timber substrates to the adhesive manufacturer's requirements.

3.19 FLOOR TO WALL FINISHING STRIP

Adhere to walls in a true, straight line using contact adhesive. Roll immediately using a seam-roller to ensure maximum bond strength is achieved.

3.20 APPLY VINYL WALL SHEET

Apply sheet to walls and heat weld seams under the technical direction of the wall sheet manufacturer's representative for each particular location.

Obtain written approval of the proposed joint layout approach from the owner, then adhesive fix either vertically or the T-method, ensuring all corners are wrapped and joints are no closer than 200mm to internal or external corners.

Cut vinyl neatly to recess on the floor/wall finishing strip and chemically weld this joint using Werner Mueller, type C welding compound.

3.21 THERMO-WELD VINYL WALL SHEET

Hand groove and thermo-weld all seams, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

Cleaning

3.22 CLEAN VINYL

Leave vinyl flooring surfaces free of adhesive, dirt and debris. Clean and finish vinyl to manufacturer's requirements.

Completion

3.23 PROTECTION

Provide the following temporary protection of the finished work:

~

4 SELECTIONS

6511 CARPETING

1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck).

It includes:

- carpet underlay
- woven sheet carpet

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2270	Plywood and blockboard for interior use
AS/NZS 2455.1	Textile floor coverings - Installation practice - General

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

- 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.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

- Provide this warranty on the installer/applicator 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

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.6 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials

2.1 UNDERLAY

To [AS/NZS 2455.1](#) Soft underlay and underlays manufacturer's requirements.
Refer to SELECTIONS for product selection.

2.2 CARPET

To [AS/NZS 2455.1](#) Textile floor coverings.
Refer to SELECTIONS for product selection.

Components

- 2.3 BINDER BARS
Anodised aluminium section with fluted face.
- 2.4 DIVIDER STRIPS
Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.
- 2.5 EDGE GRIPPER
Timber/plywood to [AS/NZS 2270](#) with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.
- 2.6 STAIR NOSING
Refer to SELECTIONS for type.

Accessories

- 2.7 ADHESIVE, UNDERLAY
To [AS/NZS 2455.1](#), clause 1.5.3. and underlay manufacturer's requirements.
- 2.8 ADHESIVE, CARPET
To [AS/NZS 2455.1](#), clause 1.5.3. and carpet manufacturer's requirements.
- 2.9 TAPE
To carpet manufacturer's requirements.

3 EXECUTION

Conditions

- 3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.
- 3.2 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work. Ensure all fittings and fixtures around which the carpet is to be scribed are in place. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with [AS/NZS 2455.1](#). Appendix B Do not commence laying carpet until readings for the whole area are within acceptable levels as follows:

Moisture Content:	Timber substrate
	- 8 -12% for air conditioned buildings
	- 10 -14% for intermittently heated buildings
	- 12 -16% for unheated buildings
	Concrete substrate 75%RH

- 3.3 PROTECTION
Protect adjoining work surfaces and finishes during the carpet installation.
- 3.4 TAPE
Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.
- 3.5 LAYOUT
Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

3.6 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

Application - general / substrate preparation

3.7 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

3.8 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed.

3.9 PREPARING EXISTING CONCRETE FLOOR

Remove existing coverings completely including adhesives, bituminous materials and paints. Patch cracks and depressions with compatible latex patching compound to the carpet manufacturer's requirements. Seal large areas of patching. Leave surface level, smooth and clean with loose material and dust removed. Seal powdery surfaces.

3.10 PREPARING EXISTING TIMBER OR WOOD PRODUCT FLOOR

Remove existing coverings completely including tacks, adhesives, bituminous materials, waxes and paints. Check for soundness, replace any substandard boards or panels and nail down loose boards. Sand smooth and remove loose material and dust.

3.11 SHEET UNDERLAYS FOR EXISTING TIMBER OR WOOD PRODUCT FLOORS

Refer to 6192 FLOORING SUBSTRATE PREPARATION for hard sheet underlays on existing floors.

Application - carpet laying

3.12 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.13 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to [AS/NZS 2455.1](#), section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

3.14 INSTALLATION, DIRECT STICK SYSTEM

Direct stick install to [AS/NZS 2455.1](#), section 3. Apply adhesive evenly over the entire substrate surface to the carpet manufacturer's requirements. Lay carpet with all edges, selvages and joins tightly butted and completely bonded to the floor surface. Roll the carpet with a clean 25 kg roller and ensure complete contact with adhesive.

3.15 INSTALLATION, DOUBLE BOND SYSTEM

Double bond install to [AS/NZS 2455.1](#), section 3. Apply adhesive on the underlay to the carpet manufacturer's requirements. Lay carpet with edges, selvages and joins tightly butted and completely bonded to the underlay surface.

3.16 LAYING TO STAIRS

Install on stairs in accordance with [AS/NZS 2455.1](#).

3.17 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

Completion

3.18 PROTECTION

Provide the following temporary protection of the finished work:

~

- 3.19 SPECIAL PROTECTION
Self Adhesive carpet protective film: ~

4 SELECTIONS

6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 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

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Specification manual
MPNZA	Health and Safety Programme
Health and Safety at Work Act 2015	

Requirements

1.3 NO SUBSTITUTIONS

Substitutions are not permitted to any specified manufacturer's system, or associated components and products.

1.4 QUALIFICATIONS

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

1.5 HEALTH AND SAFETY

Refer to the requirements of the [Health and Safety at Work Act 2015](#) and [WorkSafe: 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 Health and Safety Programme. 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: 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.

1.6 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties

1.7 WARRANTY

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

2 years: Warranty period

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

Performance**1.8 MANUFACTURER'S INSPECTION**

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.9 INSPECTION OF WORK

Inspection of the whole of the work at each of the stages scheduled 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 the Manufacturer's 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 Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

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 coating.

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: Guidelines for the provision of facilities and general safety in the construction industry](#).

3.2 PREPARE

Prepare surfaces to the coating manufacturer'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 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior

For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.

Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior

For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.

Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.9 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.

3.10 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.

3.11 PROTECTION

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

Preparation - unpainted and pre-primed timber and wood based products

3.12 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.13 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.14 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.15 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.16 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.17 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.18 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.19 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping.

Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - gypsum plaster

3.20 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - unpainted linings

3.21 PREPARING FIBROUS PLASTER

Check for and remove release agents and other contaminants by washing with clean water or solvent and allow to dry. Fill cracks and surface imperfections with patching plaster and lightly sand smooth. Remove dust.

3.22 PREPARING PLASTERBOARD

Check that joints are prepared to a smooth level surface finish. Fill cracks and surface imperfections with the sheet manufacturer's required stopping compound and lightly sand smooth. Remove dust.

Preparation - unpainted plastics

3.23 PREPARING POLYESTERS (GRP) AND PHENOL FORMALDEHYDES

Wipe surfaces with methyl ethyl ketone or other suitable solvent. Lightly abrade with sandpaper and dust off. Proceed immediately with priming.

3.24 PREPARING UNPLASTICISED POLYVINYL CHLORIDE (UPVC)

Wipe surfaces with mineral turpentine, methylated spirits or white spirit. Lightly abrade with sandpaper and dust off. Proceed immediately with topcoats applicable for walls or timber finishes.

Preparation - painted surfaces generally

3.25 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.26 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water.

Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.27 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty.

Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Preparation - painted surfaces in good condition**3.28 PREPARING SURFACES**

Wash down surfaces with either:

- a chlorine based solution; or
- 5-10 millilitres of ordinary household detergent to 1 litre of warm water; or
- a solution of 30 grams of trisodium phosphate to 1 litre of water

Replace solutions frequently and finally wipe over a second time with a clean absorbent cloth.

For surfaces containing heavy smoke and grease deposits, wash down with either:

- mineral turpentine; or
- a 5% solution of ammonia; or
- a 1:40 solution of sugar soap and water

as necessary to remove the deposits. Wipe over with a clean absorbent cloth.

Prepare coatings which have chalked by sanding, brushing, waterblasting or other methods as appropriate.

Lightly sand glossy surfaces to ensure good adhesion of the coatings.

Preparation - painted surfaces in poor condition**3.29 PREPARING PAINTED TIMBER**

Completely remove blistered, flaked, excessively chalked and cracked (due to exposed end grain and knots) paint to give a sound base for repainting. Scrape out damaged or decayed timber and where the area is extensive, arrange to cut out and replace with treated timber, primed (including end grain) before fixing.

Scrape clean loose or soft material, holes and depressions in timber due to damage or defects such as resin or gum pockets, knot holes and surface splits. Remove and replace sprung or loose corroded nails.

Where necessary strip paint back to the original timber surface, using the most appropriate of the following methods:

- burning off using a blowtorch to soften paint without charring, before scraping off with a broad knife
- using an electrically heated hot air stream to soften paint, before scraping off with a broad knife
- sanding using orbital and/or belt sanders
- paint removers used to the manufacturer's requirements
- hand scraping.

Follow [WorkSafe](#) guidelines for minimising the hazards of stripping.

3.30 PREPARING PAINTED GYPSUM PLASTER

Remove flaked paint completely from powdery, loose and other unsatisfactory plaster surfaces. Treat powdery surfaces with a solution of 150 millilitres of concentrated phosphoric acid and clean water to make 1 litre. Apply the solution, allow to stand 10 minutes and wash down with clean water. Remove loose, weak and drummy plaster and replaster. Allow to cure before proceeding with coatings as for unpainted work.

Confirm that the cause of any efflorescence has been eliminated before wiping it away with a dry rag and making good the damaged surface.

Fill small cracks and damaged surfaces with gypsum plaster or cellulose gypsum compound to just proud of the surface and lightly sand smooth and flush when dry.

3.31 PREPARING PAINTED PLASTERBOARD AND FIBROUS PLASTER

Fill cracks, pores, irregularities and damaged surfaces with the appropriate filler to the paint manufacturer's requirements, trowelled smooth, allowed to dry and lightly sanded to a smooth flush surface. Treat any staining of paint films on plaster as required by the coating manufacturer.

3.32 PREPARING PAINTED CEMENT PLASTER, CONCRETE AND MASONRY

Remove the fine white powder of efflorescence by brushing and then wiping with a clean cloth. Remove faulty mortar by wire-brushing. Make good with fresh mortar to match.

Confirm that the cause of any dampness has been eliminated and that the substrate is dry before applying any coating.

Wire brush moss or lichen affected areas to remove loose, powdery growth. Treat the affected areas with a solution of 200 millilitres of formalin (40% solution) to 800 millilitres of water. Apply the solution and leave for 3 days, or until the moss and lichen turns brown. Scrub off with a hard bristle brush and hose down liberally with water. Swab the affected area using a solution of 1 volume of household bleach to 2 volumes of water. After 30 minutes wash down with clean water.

Remove grease by continued washing with a 1:40 solution of sugar soap and water until completely removed, wash with clean water and allow to dry.

Where necessary strip paint back to the original surface by water or abrasive blasting. Remove chalk dust and dirt when dry by stiff bristle brushing.

3.33 PREPARING PAINTED METALWORK

Remove corrosion in whatever form. Sand edges to form a smooth surface with surrounding areas unaffected by corrosion. Use a chemical pre-treatment to remove the last traces of and to inhibit future, corrosion. Clean down completely before spot priming to suit the coating system specified.

Application - before applying final coatings

3.34 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.

3.35 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.

3.36 CONCEALED JOINERY SURFACES

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

3.37 CONCEALED METAL SURFACES

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

3.38 DOORS

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

3.39 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.40 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally

3.41 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.42 MIXING

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

3.43 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

3.44 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions 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

3.45 PAINT APPLICATIONS

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

3.46 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.

3.47 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.

3.48 DEFECTIVE WORK

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

3.49 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

3.50 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.

3.51 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash 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.

3.52 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.

3.53 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.

3.54 REPLACE HARDWARE

Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

4 SELECTIONS

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.

1.1 RELATED WORK

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC G4/AS1	Ventilation
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC H1/AS1-AS2	Energy Efficiency
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	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
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity.
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS 3688	Water supply and gas systems - metallic fittings and end connectors
AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings

AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters
Gas (Safety and Measurement) Regulations 2010	
Plumbers, Gasfitters and Drainlayers Act 2006	
NZ Backflow Testing Standard: NZ Backflow Testing Standard 2019 , Field testing of backflow prevention devices and verification of air gaps	

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.

Requirements

1.4 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](#).

1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

~

Provide this information prior to practical completion.

1.6 HOT WATER TEMPERATURES

To [NZBC G12/AS1](#), 6.14

Storage water heaters to store water at not less than 60°C.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45°C - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 50°C - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.7 TESTING - TO NZBC G12/AS1

Test to [NZBC G12/AS1](#), 7.6, Watertightness, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

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.

1.8 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.9 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.10 GAS APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 WATER METER

To the requirements of the network utility operator.

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 TEMPERING VALVE

Tempering valve to [NZS 4617](#) or AS 4032.2 to [NZBC G12/AS1](#).

Materials - Hot water heating appliances

2.4 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To [NZS 4305](#) [NZS 4606.1](#), [NZS 4606.2](#) and [NZS 4606.3](#), electric water storage cylinder, insulated and complete with required fittings.

2.5 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/AS1](#) or [AS/NZS 3500.1](#) and [AS/NZS 3500.4](#) as modified by [NZBC G12/AS3](#).

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 [AS/NZS 3500.1](#) and [AS/NZS 3500.4](#) as modified by [NZBC G12/AS3](#) 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 - Pipework installation

3.10 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to [NZBC G12/AS1](#).

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 [AS/NZS 3500.1](#) and [AS/NZS 3500.4](#) as modified by [NZBC G12/AS3](#) 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 [AS/NZS 3500.4](#) as modified by [NZBC G12/AS3](#) or [NZBC G12/AS1](#), table 9 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 [AS/NZS 3500.4](#) as modified by [NZBC G12/AS3](#) or [G12/AS1](#).

3.13 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) 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 HOT WATER CYLINDER INSTALLATION GENERALLY**

Install hot water cylinders complete to the manufacturer's requirements and to [NZBC G12/AS1](#), 6.11, Water heater installation or [NZS 4607](#) for Valve-vented systems.

3.16 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with [NZBC G12/AS1](#): 6.11 or [NZS 4607](#) for Valve-vented systems.

3.17 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to [NZBC G12/AS1](#).

3.18 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.19 PENETRATIONS

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

3.20 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.21 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**3.22 LABEL**

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.23 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.24 REPLACE

Replace damaged or marked elements.

3.25 LEAVE

Leave work to the standard required by following procedures.

3.26 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS**Hot water systems****4.1 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE**

Brand: ~
Model size: ~

4.2 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Brand: ~
Model size: ~
Remote controller: ~

Gas type: ~

4.3 TEMPERING VALVE

Location: ~

Brand/type: ~

7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Metalcraft Roofing** rainwater disposal systems including gutters fascias and downpipes.

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:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Are available on the website or by contacting Metalcraft Roofing.

For technical assistance contact **Metalcraft Roofing**

Web: www.metalcraftroofing.co.nz

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against:

10 years:	Failure of coating adhesion (manufacturer's standard warranty)
10 years:	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)
3 years:	Weatherproofing failure caused by substandard workmanship

From: Date of completion of installation

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **MetalcraftRoofing** materials and the techniques specified.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Metalcraft Roofing** maintenance information on completion of the roofing work.

Performance

1.8 TEST - NZBC E1/AS1

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with [NZBC E1/AS1](#).

2 PRODUCTS

Materials

2.1 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

2.2 DOWNPIPES

To AS 1273 Unplasticised PVC (uPVC) downpipe and fittings for rainwater. Complete with stand-off brackets, galvanized screw fixed. Refer to SELECTIONS for type.

Components

2.3 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

2.4 DOMES

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

2.5 GUTTER MESH

Flexible plastic mesh fitted into the gutter to the mesh manufacturer's requirements.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store downpipes, spouting 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. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

Check that fascia, barge or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

Separate 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.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL GUTTER AND FASCIA

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 600mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to **Metalcraft Roofing** details and [NZMRM CoP](#) recommendations.

3.6 INSTALL PVC DOWNPIPES

Install downpipes complete with 115 degree angle bends as needed with all joints lapped and glued. Galvanize screw fix with PVC pipe clips to rigidly stand 40mm off the wall plumb and discharging into stormwater gully or inlet pipe. All installation to **Metalcraft Roofing** details and [NZMRM CoP](#) recommendations.

3.7 INSTALL RAINWATER HEADS

Install using rivets where required to detail as shown on drawings. Ensure colour matched blind aluminium rivets are used when joining metal surfaces.

3.8 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

3.9 INSTALL PROTECTION

Fit wire mesh domes to downpipe outlets and plastic mesh to spouting to the spouting manufacturer's requirements.

Completion**3.10 REPLACE**

Replace damaged or marked elements.

3.11 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

7411MA MARLEY RAINWATER DISPOSAL SYSTEMS

1 GENERAL

This section relates to **Marley** rainwater disposal systems.
It includes;

- uPVC spouting and downpipes
- Stratus Design Series® spouting and downpipes
- associated accessories necessary to complete the installation

Documents

1.1 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E2/AS1	External moisture
AS/NZS 3500.3	Plumbing and Drainage - Stormwater drainage
AS/NZS 4020	Testing of products for use in contact with drinking water

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Marley Rainwater Sales Brochures
Marley Product Catalogue
Marley - Spouting and Downpipe DIY Installation Guide
Marley Stratus Design Series® Sales brochure
Marley Stratus Design Series® - Design and installation guide

Manufacturer/supplier contact details

Company: **Marley New Zealand Limited**
Web: www.marley.co.nz
Email: info@marley.co.nz
Telephone: 0800 MARLEY (0800 627 539)

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier Guarantee:

15 years: Against defects in material and manufacture

- Commence the guarantee from the date of purchase
- Refer to Marley NZ Guarantee available at www.marley.co.nz

Refer to the general section 1237 WARRANTIES for additional requirements.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

~ years: For installation

- When installed to Marley's published installation instructions at time of installation.
- Provide this warranty on the installer/applicator standard form.
- Workmanship warranty to be issued separately by the installer
- 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

Installers to be experienced, competent workers familiar with the materials and techniques specified.

1.6 NO SUBSTITUTIONS

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

Performance**1.7 TEST**

Test the completed Marley rainwater disposal system with water to ensure, spouting is laid to correct fall, that both spouting and downpipes are unobstructed and that no ponding occurs in spouting.

1.8 DESIGN - NZBC E1/AS1

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with [NZBC E1/AS1](#).

1.9 DRINKING WATER

All Marley spouting and downpipe systems are tested for the collection of rainwater and drinking purposes to [AS/NZS 4020](#). Care should be taken to ensure water is not contaminated by other sources.

2 PRODUCTS**Materials****2.1 UPVC SPOUTING/DOWNPipes**

Marley uPVC spouting and downpipe systems in white and grey uPVC.

2.2 STRATUS DESIGN SERIES® SPOUTING/DOWNPipes

Marley Stratus Design Series® spouting and downpipe systems in co-extruded colour outer layer with grey uPVC internal layer.

Products**2.3 MARLEY SPOUTING**

Marley spouting system, complete with Marley fittings including jointers, brackets, expansion outlets, end caps and corners supplied by Marley. Refer to SELECTIONS for type.

2.4 MARLEY DOWNPIPES

Marley downpipe system, complete with Marley fittings including bends, clips, joiners and junctions supplied by Marley. Refer to SELECTIONS for type.

Components**2.5 MARLEY MCS SOLVENT WELDING CEMENT**

Only Marley MCS® Solvent Welding Cement to be used in conjunction with the spouting and downpipe systems to manufacturer's instructions. Colour match to spouting or downpipes.

2.6 EXPANSION OUTLET/DROPPERS

Marley expansion outlet/droppers, compatible with spouting and downpipe profile.

2.7 SCREW FIXINGS - TIMBER FASCIA

Stainless steel, grade 304 finish, self tapping screws 6g x 20mm pan head or wafer head.

2.8 NAIL FIXINGS - TIMBER FASCIA

Marley galvanised nails (MCNAILS).

2.9 SCREW FIXINGS - METAL FASCIA

Self drilling tek screws 6g pan head or wafer head.

2.10 FABRICATION

Special items can be fabricated by Marley to specific dimensions on request including but not limited to angle flats, angle rakes, outlets and adaptors.

3 EXECUTION

Conditions

3.1 HANDLING AND STORAGE

Handle and store Marley downpipes, spouting 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 out of direct sunlight. Refer to Marley installation guides for further details.

3.2 SUBSTRATE

Check that fascias, bargeboards or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

3.3 THERMAL MOVEMENT

Make adequate provision in the jointing of the spouting for thermal movement in the length of the spouting by using Marley expansion joiners and/or expansion outlets. Refer to Marley expansion technical information.

3.4 ENVIRONMENTAL

Marley Spouting and Downpipe systems are suitable for most environmental conditions and will never rust, rot or corrode.

3.5 RECYCLING

All Marley manufactured spouting and downpipe systems are 100% recyclable and Marley operates recycling programs with industry suppliers where uPVC pipes can be returned from site for recycling at Marley.

Application

3.6 INSTALL MARLEY SPOUTING

Install to Marley's current published installation instructions available at www.marley.co.nz. Ensure only Marley MCS® Solvent Welding Cement to be used in conjunction with the spouting systems to manufacturer's instructions. From high points fix brackets true-to-line to give a fall of 5mm every 10 metres to outlets. Set spouting brackets at 500mm centres; reduce to 300mm spacing for high wind zones or areas subject to occasional snowfalls. Make adequate provision for thermal movement.

3.7 INSTALL MARLEY DOWNPIPES

Install to Marley's current published installation instructions available at www.marley.co.nz. Ensure that all joints are sealed properly using Marley MCS® Solvent Welding Cement. Assemble downpipes, solvent cement jointed complete, fit to outlets, fix with pipe clips every 1.2 metres, fix pipe clips with 304 stainless steel screws, plumb and discharging into the stormwater gully or pipe inlet to the Marley required practice.

Painting Marley uPVC spouting/downpipes

3.8 PAINTING

After installation use a mineral based undercoat and two coats of 100% weatherable acrylic paint. Do not paint the inside of spouting or internal brackets.

Completion

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

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

NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to [AS/NZS 1260](#) complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

Stainless steel pipe and associated fittings

PVC, PE polyethylene or polypropylene pipe including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to [NZBC G13/AS1](#) and [NZBC G1/AS1](#) and complete all tests to G13/AS1, 7.1 Test Methods.

3.2 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to [AS/NZS 3500.2](#), as modified by [NZBC G13/AS3](#), and complete all tests to [AS/NZS 3500.2](#), section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.3 ELECTROLYTIC ACTION

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

3.4 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to [AS/NZS 3500.2](#), as modified by [NZBC G13/AS3](#), and jointing to PVC-U pipes to [AS/NZS 2032](#).

Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.5 INSTALL ELECTRIC PAN VENTS

Install electric pan vents to manufacturers' requirements. Leave ready for electrical connection by electrician.

3.6 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.7 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS1](#), 7.1 Test Methods or [AS/NZS 3500.2](#), section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.8 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

7430 DRAINAGE

1 GENERAL

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

1.1 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction
Plumbers, Gasfitters and Drainlayers Act 2006	

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 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to [AS/NZS 1254](#) and [AS/NZS 1260](#).

Underground PVC-U pipe to be classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 POLYETHYLENE PIPES

Polyethylene pipes and fittings to [AS/NZS 5065](#).

2.5 PERFORATED PIPE - SUBSOIL DRAINAGE

Perforated corrugated coil high density polyethylene subsoil drainage pipe to AS 2439.1 with polypropylene filter sock over, for groundwater drainage.

2.6 GULLY TRAPS - NZBC G13/AS2

To [NZBC G13/AS2](#): 3.3 Gully traps, complete with grating.

2.7 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to [AS/NZS 3500.2](#), 4.6 Gullies, as modified by [NZBC G13/AS3](#).

2.8 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.9 STRIP DRAIN CHANNEL

Proprietary, modular, variable invert, plastic, steel (various types), or polymer concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

2.10 INSPECTION COVERS

Cast iron frame with screw-down cover.

2.11 TRENCH BACKFILLING MATERIAL, FOUL WATER - NZBC G13/AS2

Bedding and backfilling material to [NZBC G13/AS2](#), 2.0 Materials, for methods shown in [NZBC G13/AS2](#), figure 7, Bedding and backfilling.

2.12 TRENCH BACKFILLING MATERIAL, FOUL WATER - AS/NZS 3500.2

Bedding and backfilling material to [AS/NZS 3500.2](#), 5.4, Bedding of drains, and for concrete, if required, [AS/NZS 3500.2](#), 5.3 Concrete Support.

2.13 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Free draining crushed stone, 7 mm to 20 mm in size.

2.14 FILTER FABRIC

Polymeric fabric formed from a plastic yarn or a long chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, amide, ester or vinylidene chloride. Fibres to be rot proof, chemically stable and have low water absorbency. The filter network, (woven or non-woven) must be dimensionally stable and resistant to delamination.

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.
- [AS/NZS 3500.3](#), 6.2.8, Installation near and under buildings, as modified by [NZBC E1/AS2](#).
- [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 FOUL WATER DRAINAGE GENERALLY - NZBC G13/AS2

Carry out foul water drainage work to [NZBC G13/AS2](#) and [NZBC G1/AS1](#) and complete all tests to [NZBC G13/AS1](#), 7.1 Test Methods.

Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#). Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#).

3.4 FOUL WATER DRAINAGE GENERALLY - AS/NZS 3500.2

Carry out this work to [AS/NZS 3500.2](#) and complete all tests to [AS/NZS 3500.2](#), section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#). Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#).

3.5 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.

3.6 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to [NZBC G13/AS2](#), 3.3 Gully traps.

3.7 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to [AS/NZS 3500.2](#), section 4.6, Gullies.

3.8 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.

3.9 FILTER FABRIC TO DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Where details require drainage material to be encapsulated in filter fabric to prevent fines from blocking the aggregate. Place fabric and carefully hold in place by pinning and/or by controlled use of aggregate as ballast. After drain installation and required backfilling, complete encapsulation with fabric. Ensure filter fabric is correctly placed, sufficiently overlapped and pinned and/or secured.

3.10 LAY PERFORATED PIPING - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. Lay in straight runs to discharge into surface water drainage system. The pipe must not excessively elongate during installation. Carry drainage material up and over the pipes without disturbing them. Extend the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.11 LAY PERFORATED PIPING TO BASEMENT WALLS - SUBSOIL DRAINAGE

Ensure any required waterproofing and protection sheets are in place before starting work. Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. The pipe must not excessively elongate during installation. Lay in straight runs to 1:150 gradients with invert of the highest horizontal point 50 mm minimum below floor slab level, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Fill with drainage material to full height of wall. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.12 LAY PERFORATED PIPING TO RETAINING WALLS - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage metal comprising of filter material to the [NZTA F2](#) specification. Pipe bedding not less than 75mm deep. Backfill not less than 300mm deep. The pipe must not excessively elongate during installation. Lay in straight runs to correct gradients, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Place granular fill in layers not exceeding 150 mm thick loose depth, to full height of wall, with an allowance for the thickness of the surface finish. Compact to provide support of not less than that of the adjacent material. Where geocomposite drain is used, the backfill shall follow the manufacturer's recommendations. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.13 INSTALL STRIP DRAIN CHANNEL

Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.

3.14 INSTALL SURFACE WATER SUMP

To [NZBC E1/AS1](#) or to [AS/NZS 3500.3](#) section 7 as modified by [NZBC E1/AS2](#), complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.15 INSTALL STORMWATER INSPECTION CHAMBERS

Construct as detailed on a poured concrete footing to [NZBC E1/AS1](#), 3.7, Access for maintenance, or to [AS/NZS 3500.3](#), section 7 as modified by [NZBC E1/AS2](#). Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.16 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.

3.17 INSTALL FOUL WATER INSPECTION CHAMBERS - AS/NZS 3500.2

Construct as detailed on a poured concrete footing to [AS/NZS 3500.2](#), 4.7 Inspection openings and 4.8 Inspection chambers, as modified by [NZBC G13/AS3](#). Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.18 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.

3.19 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.

3.20 TESTING - FOUL WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS1](#), 7.1 Test Methods or [AS/NZS 3500.2](#), section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.21 TRENCH BACKFILLING GENERALLY - FOUL WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.22 CLEAN OUT SUBSOIL DRAIN INSTALLATION

Clean and flush out the whole subsoil drain installation and remove silt and debris before handing over.

4 SELECTIONS

7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

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:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	general lighting service
IP	international (ingress) protection classification
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
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:

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3439.3	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
NZS 4514	Interconnected smoke alarms for houses

NZS 4246	Energy Efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Components for low voltage surge protection devices
Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).	
TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services	

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

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 Cable Installers Guidelines for Telecommunication Services](#) 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 WORKERS – LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 QUALIFICATIONS - SECURITY SYSTEM

Installation by an installer licensed under the Private Investigators and Security Guards Act. Installation of all security equipment to comply with [AS/NZS 2201.1](#) Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance.

1.7 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 Electricity (Safety) Regulations (2010), regulation 58.

1.8 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

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

1.9 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 high risk electrical work as required by regulation 70.

1.10 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, 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

Tough plastic sheathed neutral screened cable to [AS/NZS 5000.2](#) 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: 1.5mm ² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm ² on 16 amp MCBs
Power circuits:	2.5mm ² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm ² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm ² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm ² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm ² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm ² high temperature cable 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 (roof spaces above insulation etc).

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](#), or AS/NZS 61439.3, 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. Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units. Refer to SELECTIONS.

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 FIRE & SMOKE ALARM SYSEM

Refer to SELECTIONS.

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 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to [AS/NZS 3113](#). Terminal type. Suspended fittings to have sheathed round flexible cord to [AS/NZS 3008.1.2](#). Refer to SELECTIONS.

2.13 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.14 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board.

2.15 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.

2.16 EMERGENCY LIGHT FITTINGS

Emergency escape lighting and exit signs for buildings to AS 2293.3. Exit, recessed, ceiling or wall mounted. Refer to SELECTIONS.

2.17 SPACE HEATERS

Fixed wired room heaters radiant or convector, and compliant with [AS/NZS 60335.1](#). Flush or surface mount, fitted with safety cut-outs.

2.18 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to [NZBC G4/AS1](#), and compliant with [AS/NZS 60335.1](#).

2.19 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 60335.1](#), scratch resistant powdercoated or chrome finish.

2.20 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.

Electrical automation system

2.21 ELECTRICAL AUTOMATION SYSTEM

Electrical automation system designed to enable if required:

- Lighting - automated control and dimming timer control.
- Heating including heated towel rails and ventilation systems.
- Security - programmable to simulate lights and other devices to give appearance home is occupied - ability to interface with security system and smoke detectors to activate lights.
- Energy efficiency - automatically switch circuits off when not required or on during low tariff times.
- Appliances.
- Spa pools.
- Irrigation systems.

Security system

2.22 CONTROL PANEL

Control panel system with a minimum of one installer code, one master code, 6 zones minimum and 6 user codes. The installer to select codes to suit installation.

2.23 DETECTORS

There are two main types of detectors:

- Standard passive infrared sensors: Install in stable environments with no wind flow and no direct bright sunlight.
- Passive infrared/ microwave sensors: Install in area where environmental stability is an issue.

2.24 AUDIBLE DEVICES

Internal sirens can be either a 12V Piezo Siren or a Horn speaker with a sound pressure level of no less than 95dB.

External siren can be either a stainless steel design or have hardened plastic casing. Both designs to be fully weatherproof but not limited to IP66 Rating. The siren box to contain a strobe diffuser in either blue or red. The siren shall contain a horn speaker, 12v speaker or an electronic siren. The external siren box to have both a cover and rear wall tamper mechanism.

2.25 CABLING

Security alarm wiring to NZS/AS 1125 for cables.

Security alarm wiring to be multi stranded and not single stranded, minimum 0.5mm².

2.26 PERIPHERALS

Fit anti-tamper devices to detectors, control panels and equipment housings, programmed to give a tamper indication when the system is unset and a tamper alarm when the system is set.

Standard keypad manufactured of moulded hardened plastic with either a LED or LCD screen, to match the style of the wiring accessories in diameter, colour and aesthetics.

2.27 COMMUNICATIONS

Digital dialler to be built into the PCB of all control panels, with the options for both monitoring and remote dial in windows based software. Digital dialler to comply with all the industry standard communication formats including contact I.D and SIA, and NZ Telepermit certification.

Remote software able to upload / download programming changes and or history events and change status of the security alarm with the ability to be turned off if required.

3 EXECUTION

Fire rated sealers and liners

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 and Electricity Retailer 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 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/NZS 3000](#) to protect each final sub circuit.

3.5 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.

3.6 EARTH LEAKAGE PROTECTION

Install RCD protection to [AS/NZS 3000](#).

3.7 RCD - RESIDENTIAL 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](#).

3.8 RCD - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk 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.

3.9 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.

3.10 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.

3.11 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.

3.12 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 noggs. Fix switch panel wall boxes to solid blocking.

3.13 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.14 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements.

3.15 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer 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](#).

3.16 EMERGENCY LIGHTING

Emergency escape lighting and exit signs for buildings to AS 2293.1 and [NZBC F6/AS1](#). Fit emergency light fittings to manufacturer specifications. Refer to plans for position of fittings.

3.17 ELECTRIC HOT WATER SYSTEM

For storage heaters, 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.

3.18 SPACE HEATERS

Install to the heater manufacturer requirements, and to [AS/NZS 3000](#). Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance, or otherwise connect to a control switch located adjacent to the heater and a remote thermostat.

3.19 SURGE PROTECTION

Install surge protection devices to manufacturer 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.

3.20 ELECTRIC POWERED FITTINGS AND EQUIPMENT

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

3.21 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](#)
- 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](#).

3.22 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with [AS/NZS 3000](#) and in accordance with the manufacturer 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 and sockets to IP56. Install to manufacturer 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.

3.23 ELECTRICAL AUTOMATION SYSTEM

Fit distribution cabinet in wall, cut-out to finish flush with the wall surface, or surface mounted.

Configure installation to manufacturer instructions. Provide adequate user training and operating manual to the owner.

3.24 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.

Security system

3.25 SECURITY SYSTEM

Install to the system manufacturer requirements, control panel, detectors and associated equipment fitted neatly and without damage to surrounding finishes. Installation of security equipment to [AS/NZS 2201.1](#) Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance. All 230v mains power connections to the security panel are to be in accordance with [AS/NZS 3000](#). The 230V power is to be switched using a dedicated single gang Isolator switch or similar.

Fire rated sealers and liners

3.26 SEAL ALL PENETRATIONS

Seal all penetrations, including in and around conduits and sleeves, in accordance with manufacturer instructions. For fire and/or acoustic rated elements, maintain the rating with the seal systems.

3.27 PROVIDE CABLE SLEEVES

Provide PVC sleeves formed from pipe sections, unless fire and/or acoustic systems require sleeves for other building elements and/or different material for the sleeve.

Fire rated accessories

3.28 INSTALL WALL BOXES AND SWITCH UNITS - FIRE RATED

Install proprietary fire rated wall boxes and switch units in accordance with manufacturer instructions.

Completion & Commissioning**3.29 COMPLETION MATTERS**

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

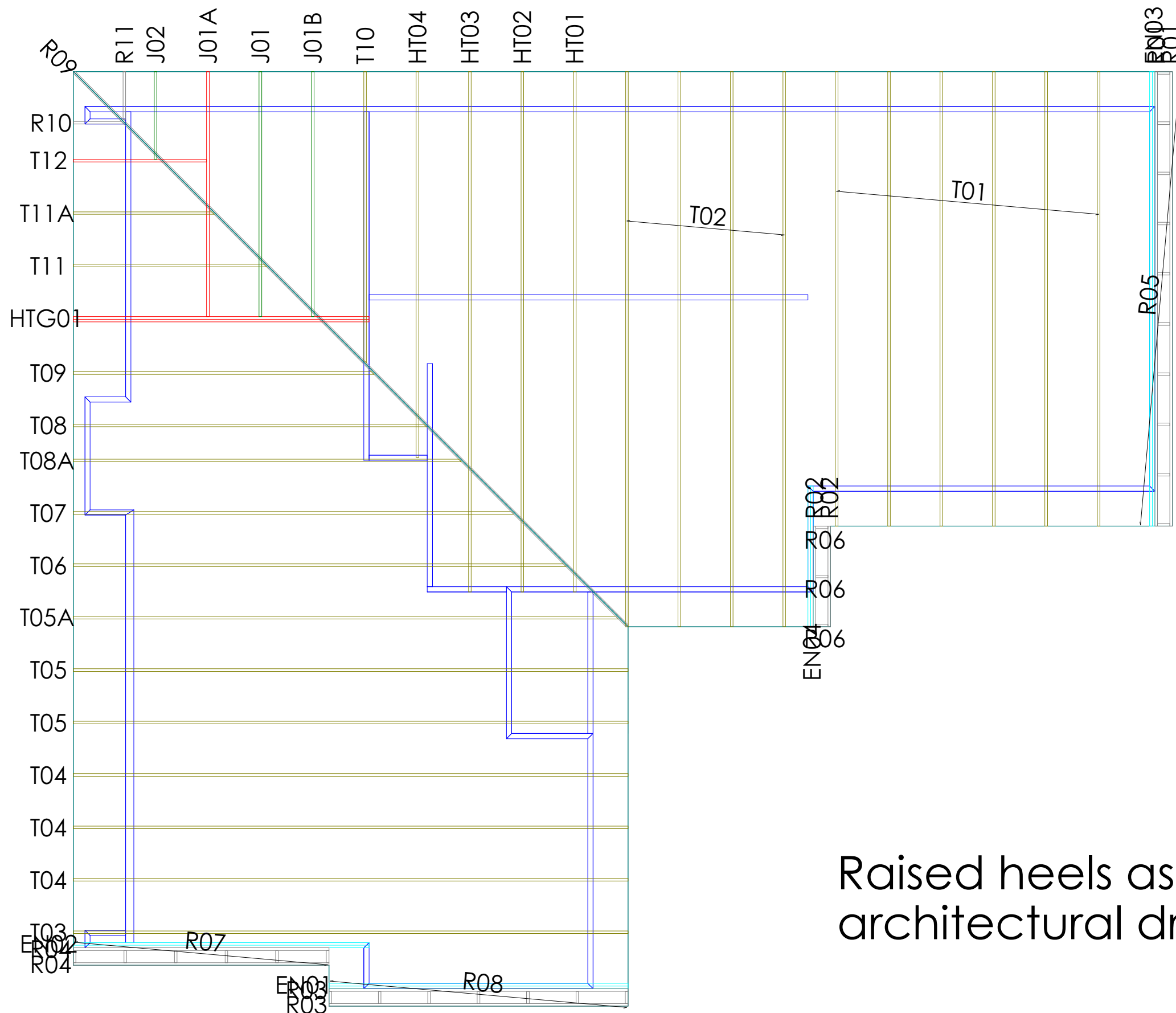
3.30 FIRE RATED SEALERS AND LINERS

Sealants, collars, wraps, expanding foam, mortars and liners, used to seal around pipe, conduit and sleeve penetrations through fire and acoustic walls and floors. Refer to SELECTIONS for type.

Fire rated accessories**3.31 WALL BOXES AND SWITCH UNITS - FIRE RATED**

Proprietary intumescent pad for plastic electrical sockets installed in plasterboard lined fire rated partitions providing an acoustic barrier and fire protection. Refer to SELECTIONS for type.

4 SELECTIONS**Materials**



Raised heels as per
architectural drawings

PrimeCad v4.7.346



34 Carncross Street
Mosgiel
Ph 03 484 7280

Site Address :
A1 Homes
Burgess & Allen
7 Whitehaven St
Oamaru

Sheet Title :
**For Building Consent
Buildable Truss Layout**

Date : 7 Jun,2024
Scale : 1: 100
Drawn : Craig Murphy
System : MiTek 20/20

Job Details:
Roof Pitch : 5.00deg
Roof Material : Longrun Iron .55mm
Ceiling Material : Rondo on clips
Wind Zone : High
Roof Snow Load : 0.630kPa

Truss Centres : 900mm
Roof Live Load : 0.250kPa
Floor Live Load :
Wind Speed : 44m/s
Overhang : 600mm

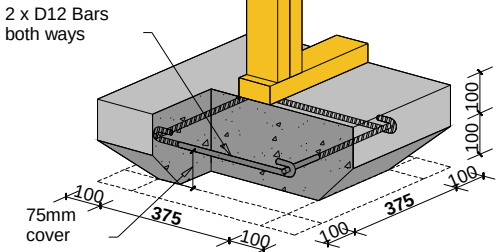


Job Title :
252947P
Sheet :
1
Revision Number :

SLAB THICKENING & STUD REQUIREMENTS

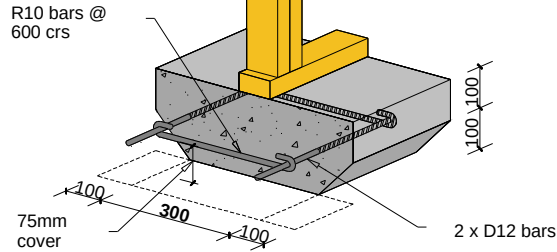
TYPE FP1 375mm² Pad

2 3



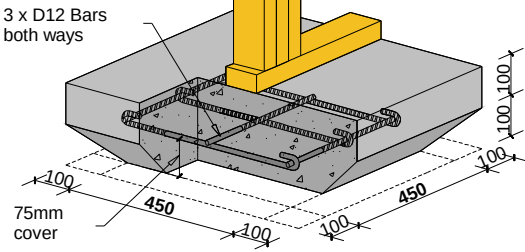
TYPE FS1 300mm Strip

2 3



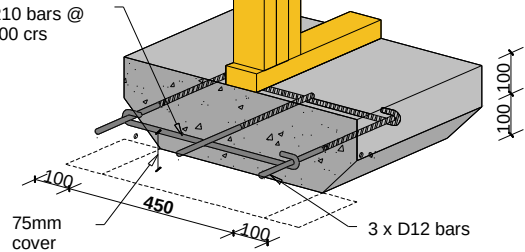
TYPE FP2 450mm² Pad

3 4



TYPE FS2 450mm Strip

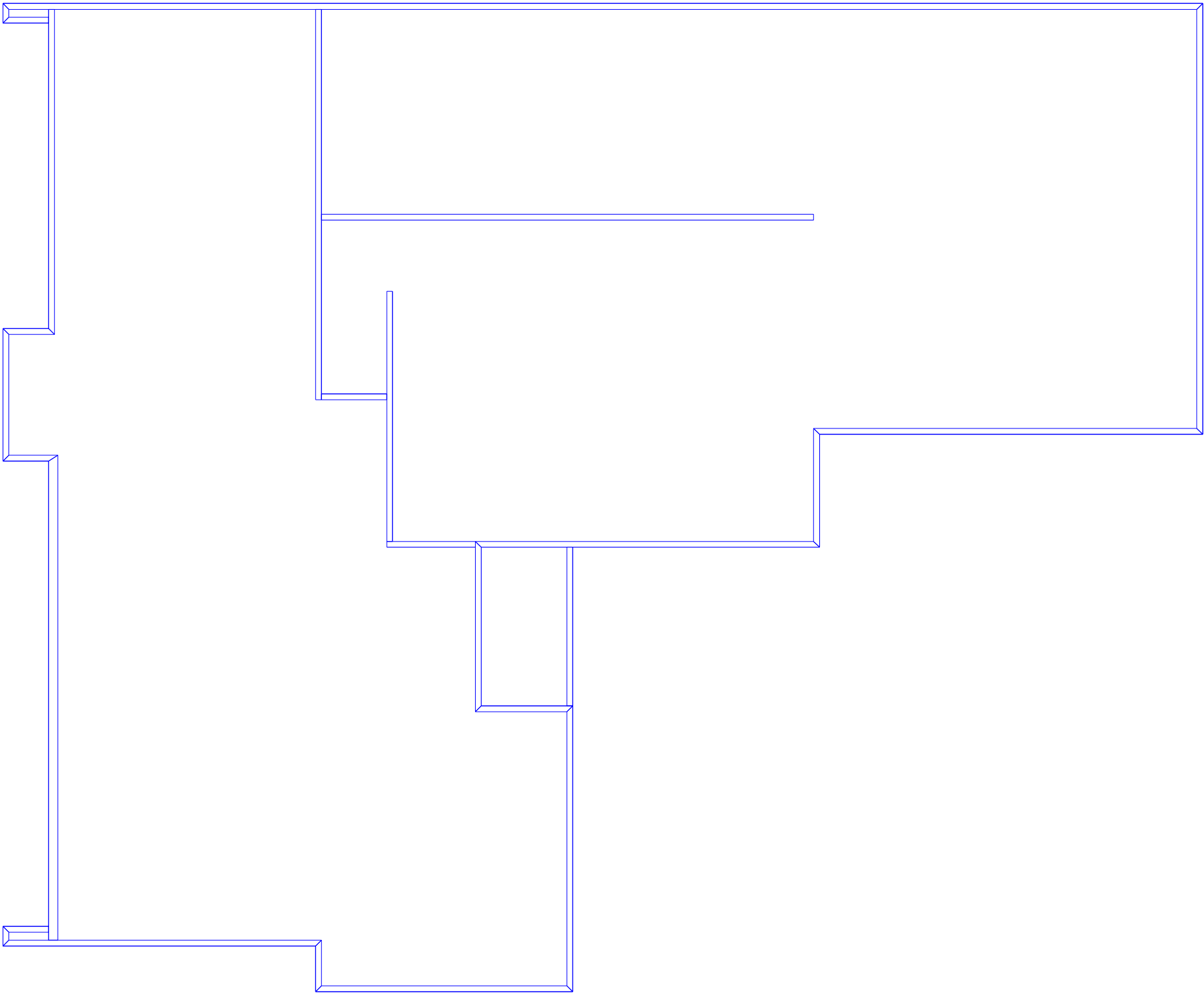
3 4



Notes:
- The numbers found in the hatched areas are the numbers of studs required below each truss
- Standard 100mm reinforcing concrete slab, as per NZS3604:2011

Refer to:
MiTek Internal Load Bearing on Concrete Floor Slabs 10/2011
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance

Concrete Slab Thickening Guide



NO SLAB THICKENING REQUIRED



34 Carncross Street
Mosgiel
Ph 03 484 7280

Site Address :
A1 Homes
Burgess & Allen
7 Whitehaven St
Oamaru

Sheet Title :
For Building Consent
Slab Thickening

Date : 7 Jun,2024
Scale : 1: 100
Drawn : Craig Murphy
System : MiTek 20/20

Job Details:
Roof Pitch : 5.00deg
Roof Material : Longrun Iron .55mm
Ceiling Material : Rondo on clips
Wind Zone : High
Roof Snow Load : 0.630kPa

Truss Centres : 900mm
Roof Live Load : 0.250kPa
Floor Live Load :
Wind Speed : 44m/s
Overhang : 600mm



Job Title :
252947P
Sheet :
2
Revision Number :

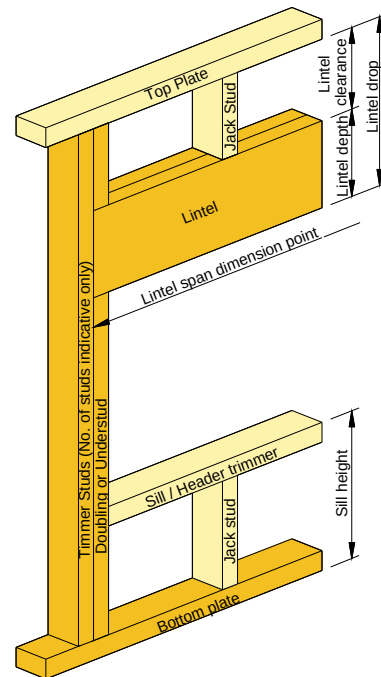
PrimeCad v4.7.346

TYPE E
1.4 kN

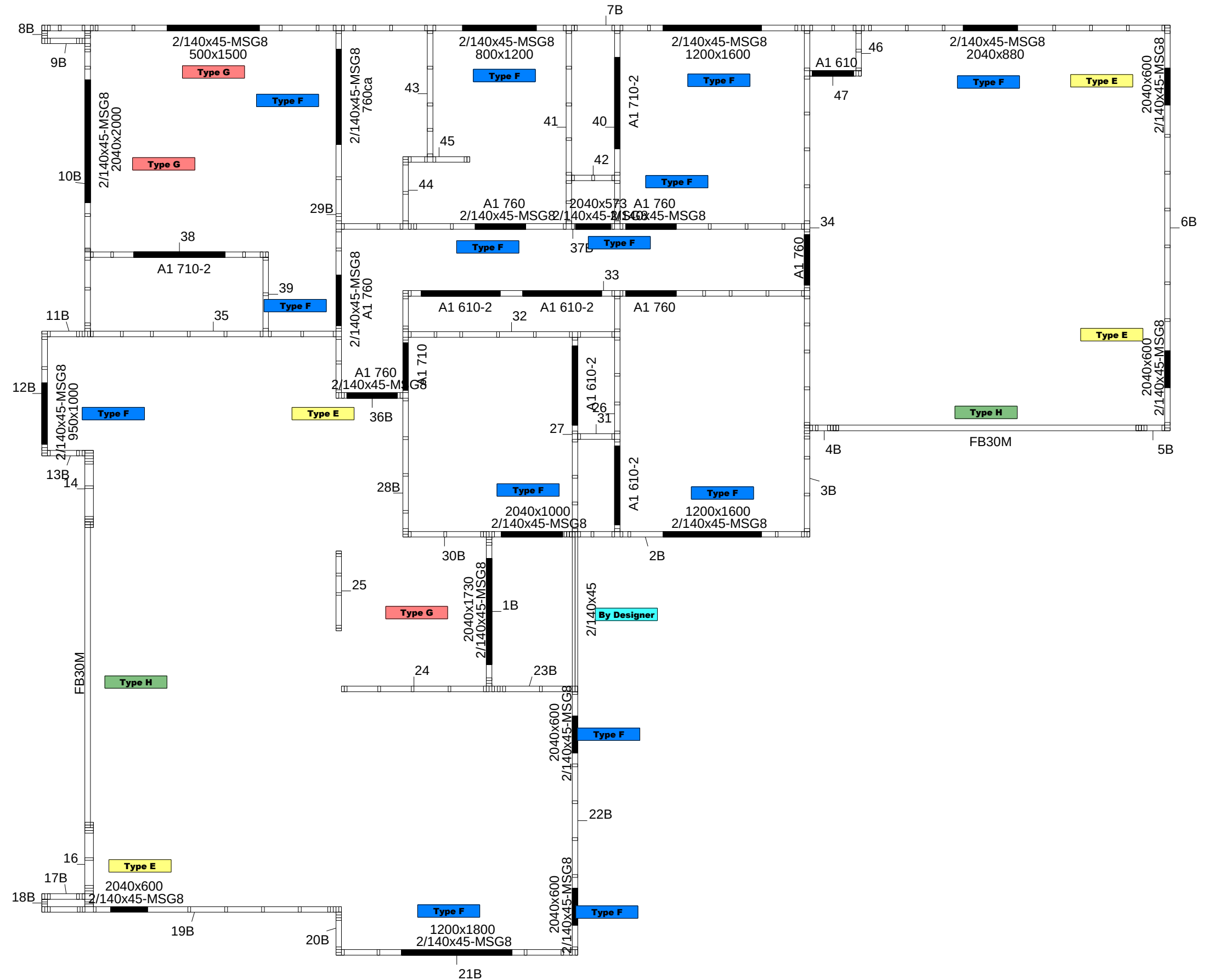
TYPE F
4.0 kN

TYPE G
7.5 kN

TYPE H
13.5 kN



Refer to:
LUMBERLOK Intel Fixing Schedule 10/2011
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance
(Alternative to Table 8.14 & Figure 8.12 NZS 3604:2011)



PrimeCad v4.7.346



34 Carncross Street
Mosgiel
Ph 03 484 7280

Site Address :
A1 Homes
Burgess & Allen
7 Whitehaven St
Oamaru

Sheet Title :
**For Building Consent
Lintel Fixing**

Date : 7 Jun,2024	Drawn : Craig Murphy
Scale : 1: 100	System : MiTek 20/20

Job Details:	
Roof Pitch	: 5.00deg
Roof Material	: Longrun Iron .55mm
Ceiling Material	: Rondo on clips
Wind Zone	: High
Roof Snow Load	: 0.630kPa

Truss Centres : 900mm
Roof Live Load : 0.250kPa
Floor Live Load :
Wind Speed : 44m/s
Overhang : 600mm

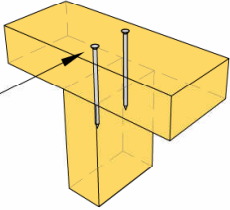


Job Title :	252947P
Sheet :	3
Revision Number :	

TYPE A - 0.7 kN

Non-Load Bearing Walls

2 x 90mm x 3.15 Ø plain
steel wire nails driven
vertically through single Top
Plate into stud



*Images are indicative only.
Timber sizes may vary.

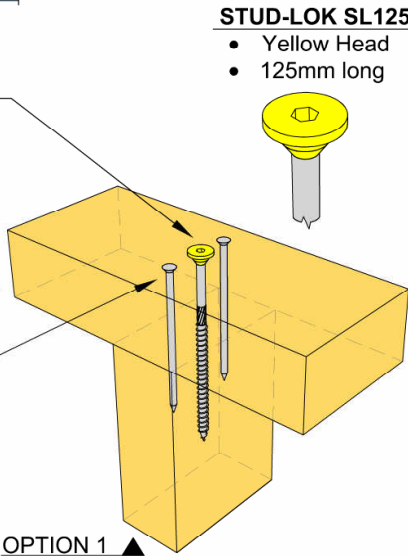
TYPE B - 4.7 kN

Load Bearing Walls

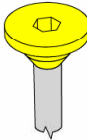
1 x STUD-LOK **SL125**
screwed vertically through
single Top Plate into stud.

Max.Top Plate
Depth = 45mm

2 x 90mm x 3.15 Ø plain
steel wire nails driven
vertically into stud.



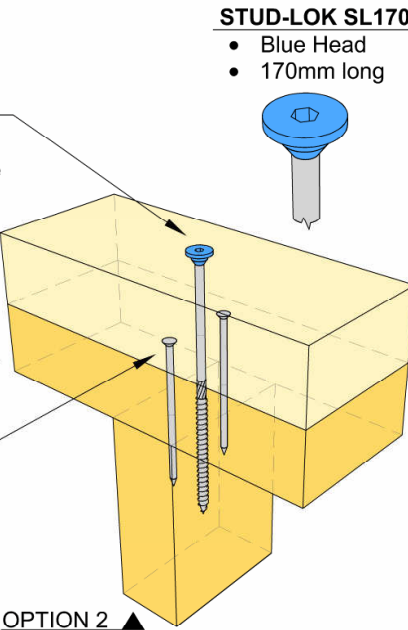
STUD-LOK SL125
• Yellow Head
• 125mm long



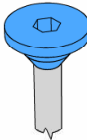
1 x STUD-LOK **SL170**
screwed vertically through
single or double Top Plate
into stud.

Max.Top Plate
Depth = 90mm

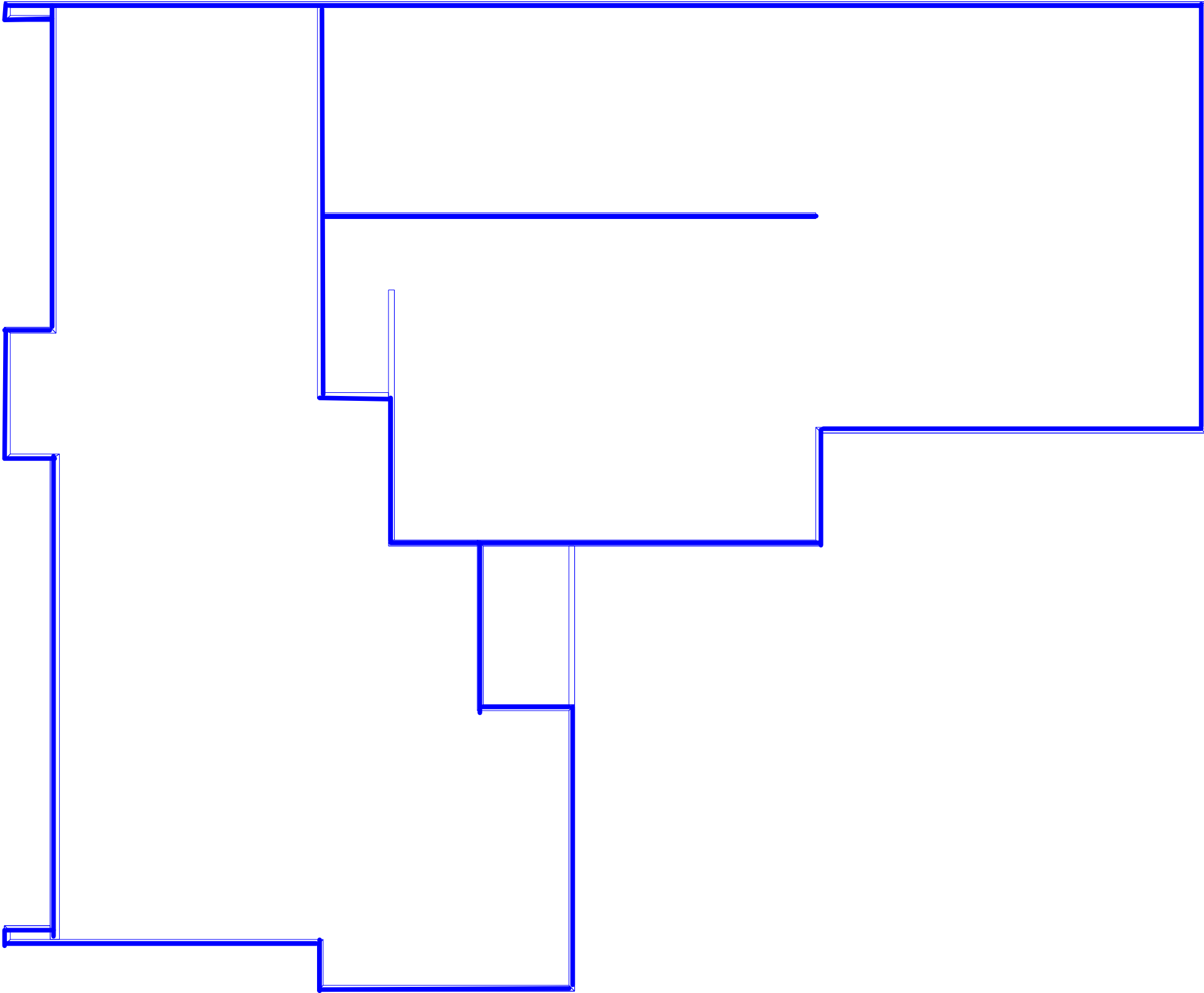
2 x 90mm x 3.15 Ø plain
steel wire nails driven
vertically into stud.

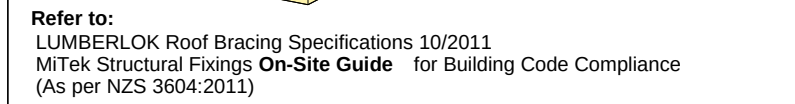


STUD-LOK SL170
• Blue Head
• 170mm long

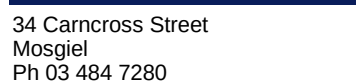
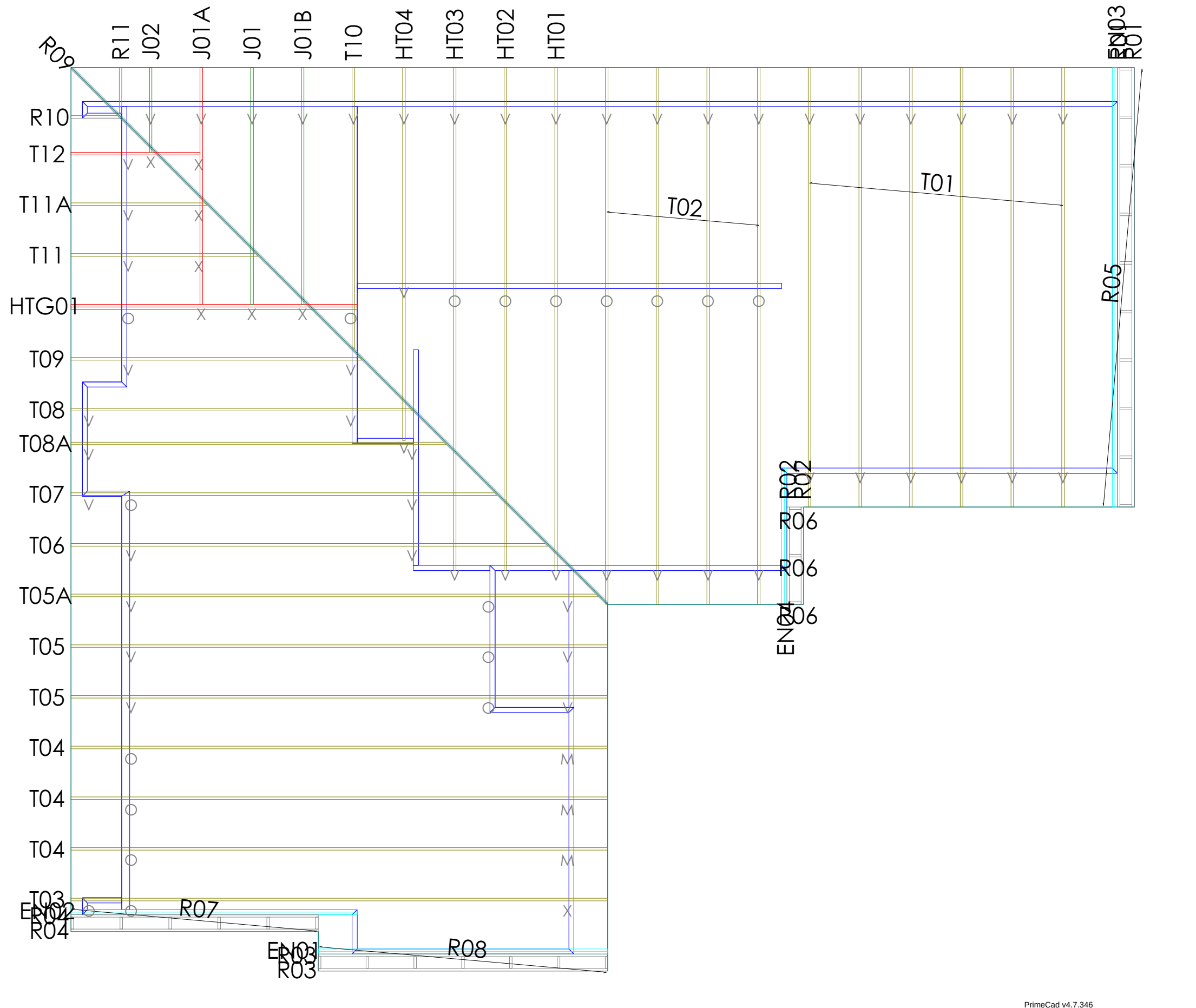
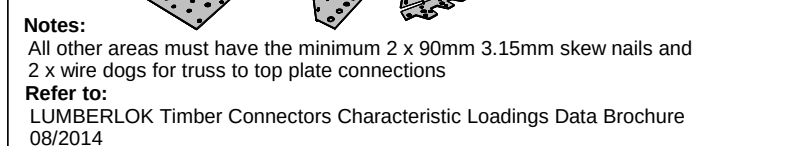


(Alternative to NZS 3604:2011 Section 8)





X - LUMBERLOK JH47x90 Joist Hanger	Joist Hanger Installation 
Z - LUMBERLOK JH47x120 Joist Hanger	
P - LUMBERLOK JH47x190 Joist Hanger	
E - LUMBERLOK JH95x165 Joist Hanger	
T - LUMBERLOK CT200 Ceiling Tie	CT200 Truss to Top Plate Fixing Installation 
O - Pair of LUMBERLOK CT200 Ceiling Ties	
H - LUMBERLOK CT400 Cyclone Tie	
B - LUMBERLOK CT600 Cyclone Tie	
4 - LUMBERLOK Multi Grip	
M - Pair of LUMBERLOK Multi Grips	
NP - LUMBERLOK Nailon Plate	
N - LUMBERLOK N21 Diagonal Cleat	
V - LUMBERLOK CPC40 Cleat	
W - Pair of LUMBERLOK CPC40 Cleats	
K - LUMBERLOK TTP 16kN Truss to Top Plate set	
G - LUMBERLOK TTP 9kN Truss to Top Plate set	

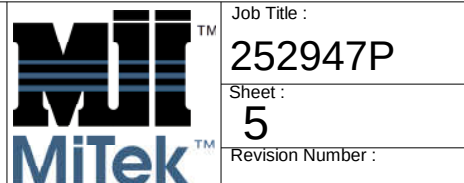


Site Address : A1 Homes Burgess & Allen 7 Whitehaven St Oamaru	Sheet Title : For Building Consent Truss Fixings & Roof Bracing	
	Date : 7 Jun,2024	Drawn : Craig Murphy
	Scale : 1: 100	System : MiTek 20/20

Sheet Title : For Building Consent Truss Fixings & Roof Bracing		Job Details: Roof Pitch : 5.00deg Roof Material : Longrun Iron .55mm Ceiling Material : Rondo on clips Wind Zone : High Roof Snow Load : 0.630kPa		Truss Centres : 900mm Roof Live Load : 0.250kPa Floor Live Load : Wind Speed : 44m/s Overhang : 600mm	
Date : 7 Jun,2024	Drawn : Craig Murphy				
Scale : 1: 100	Svsstem : MiTek 20/20				

Job Details:	
Roof Pitch	: 5.00deg
Roof Material	: Longrun Iron .55mm
Ceiling Material	: Rondo on clips
Wind Zone	: High
Roof Snow Load	: 0.630kPa
Truss Centres	: 900mm
Roof Live Load	: 0.250kPa
Floor Live Load	:
Wind Speed	: 44m/s
Overhang	: 600mm

Truss Centres : 900mm
Roof Live Load : 0.250kPa
Floor Live Load :
Wind Speed : 44m/s
Overhang : 600mm

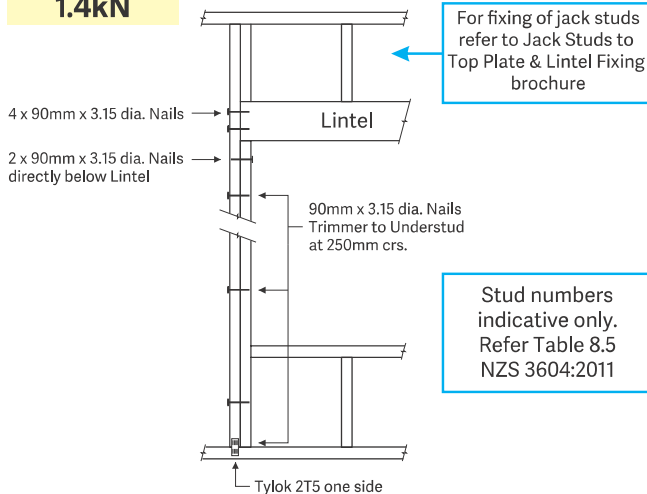


Job Title :	252947P
Sheet :	5
Revision Number :	

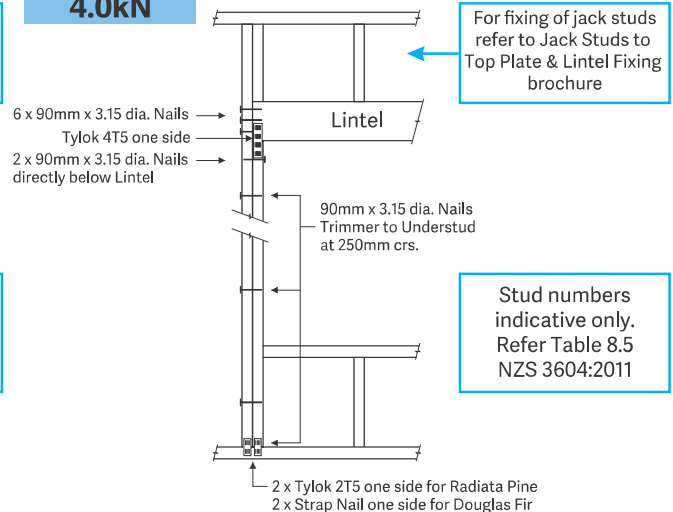
LINTEL FIXING OPTIONS

(Characteristic Uplift)

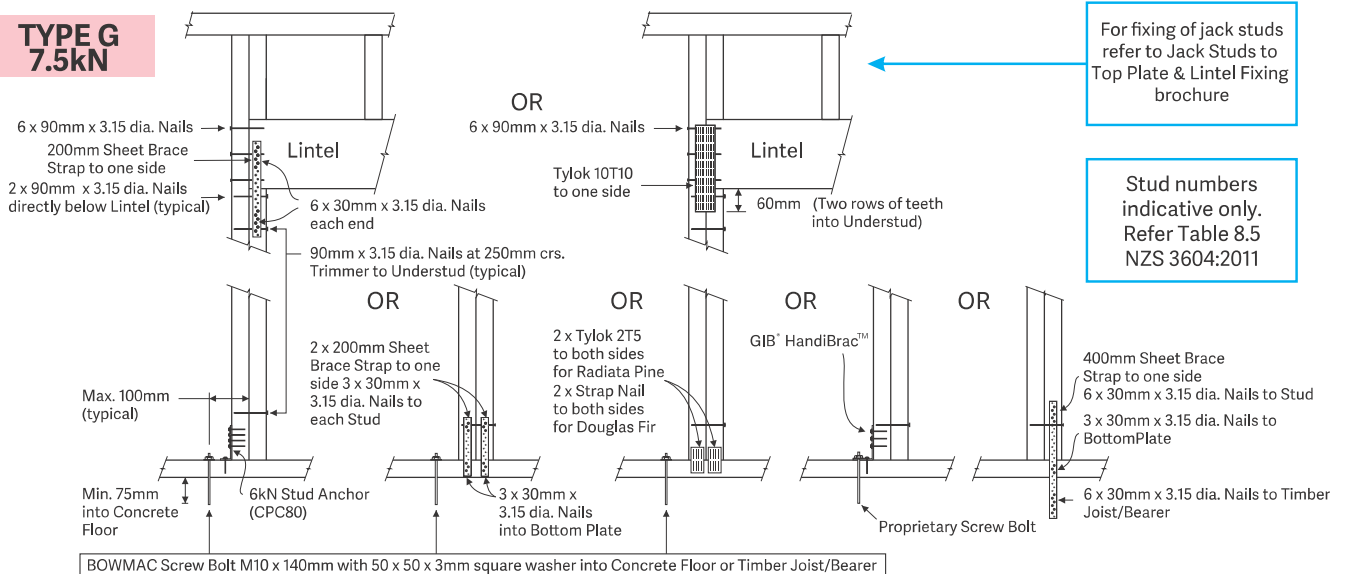
TYPE E 1.4kN



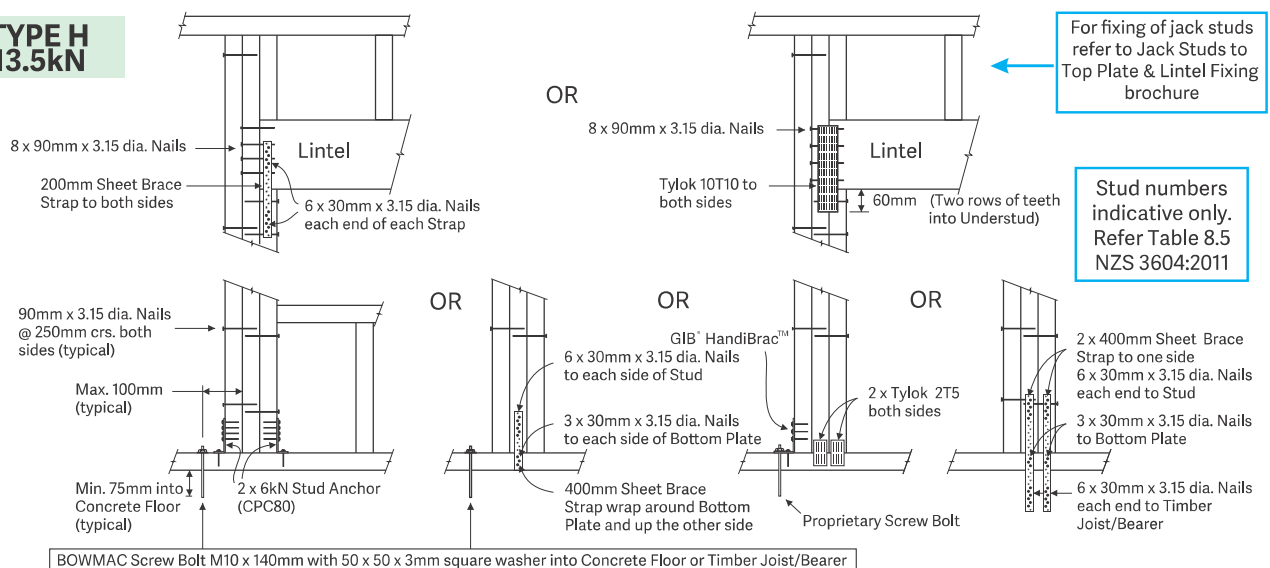
TYPE F 4.0kN



TYPE G 7.5kN



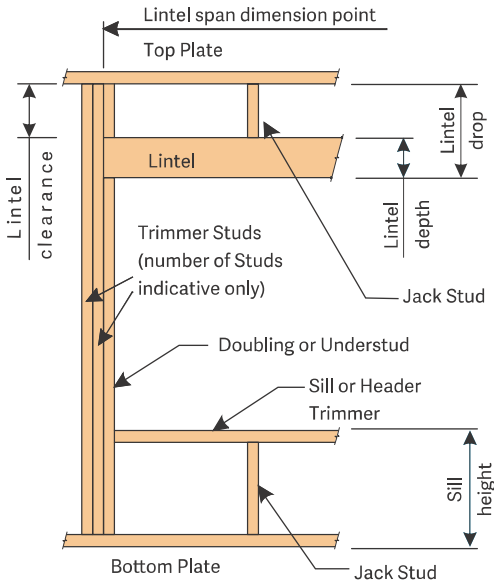
TYPE H 13.5kN



STUD-LOK LINTEL FIXING OPTIONS
FOR ON-SITE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12
NZS 3604:2011

- All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20kPa.
- 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
- Wall framing arrangements under girder trusses are not covered in this schedule
- All timber selections are as per NZS 3604:2011.



8. WALLS

LINTEL SUPPORTING GIRDER TRUSSES

Roof Tributary Area	Light Roof			Heavy Roof		
	Wind Zone			Wind Zone		
	Low, Medium, High	Very High	Extra High	Low, Medium, High	Very High	Extra High
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	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

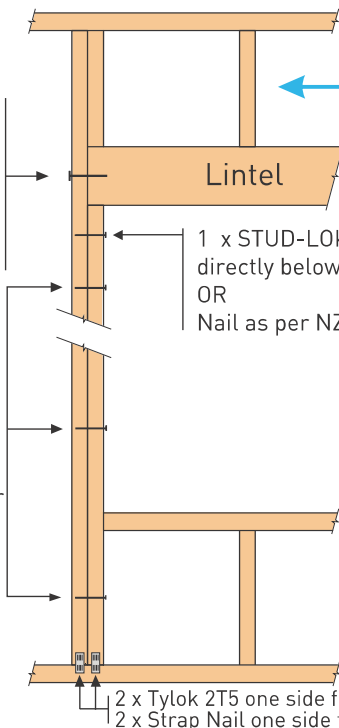
Lintel Span (m)	Loaded Dimension (m)	Light Roof					Heavy Roof				
		Wind Zone					Wind Zone				
		Low	Medium	High	Very High	Extra High	Low	Medium	High	Very High	Extra High
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	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	F	F	G	G	H	E	E	F	G	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	G	G
	6.0	F	F	G	H	H	E	E	F	G	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	G	G
	5.0	F	F	G	H	H	E	E	F	G	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	G	G
	4.0	F	F	G	H	H	E	E	F	G	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	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	H
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	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	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	H
	3.4	F	G	H	H	-	E	F	G	H	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	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	H	H	E	E	F	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	H	H	E	E	F	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-

STUD-LOK LINTEL FIXING OPTIONS FOR ON-SITE

TYPE F 4.0kN

For Lintel 140mm min.
2 x STUD-LOK SL125
(green)
Refer Detail 1 for
90mm Stud
Refer Detail 2 for
140mm Stud

STUD-LOK SL80
(white)
Trimmer to
Understud at
400mm crs.
OR
Nail as per
NZS 3604:2011



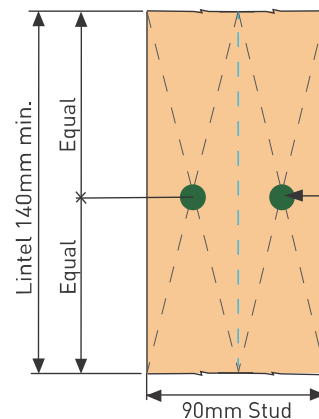
For fixing of Jack Studs
refer to Jack Stud to
Top Plate & Lintel
Fixing brochure

1 x STUD-LOK SL80 (white)
directly below Lintel
OR
Nail as per NZS 3604:2011

Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

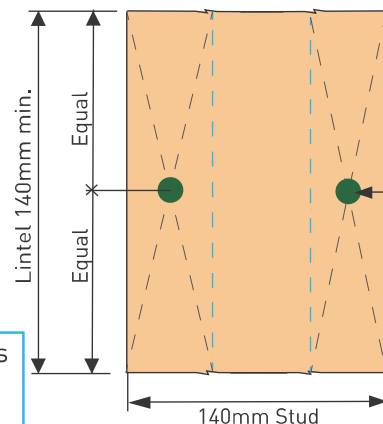
2 x Tylok 2T5 one side for Radiata Pine OR
2 x Strap Nail one side for Douglas Fir

Detail 1



STUD-LOK
SL125 (green)

Detail 2

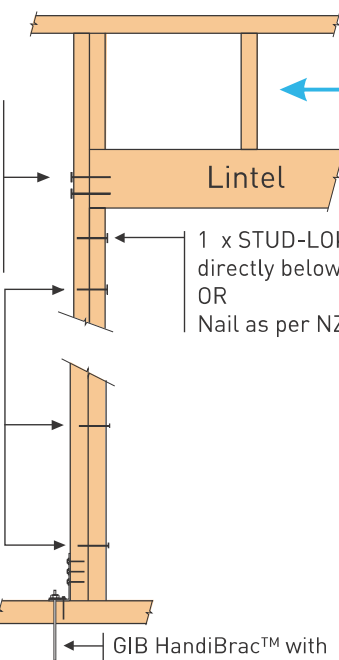


STUD-LOK
SL125 (green)

TYPE G 7.5kN

For Lintel 140mm min.
4 x STUD-LOK SL125
(green)
Refer Detail 3 for
90mm Stud
Refer Detail 4 for
140mm Stud

STUD-LOK SL80
(white)
Trimmer to
Understud at
400mm crs.
OR
Nail as per
NZS 3604:2011



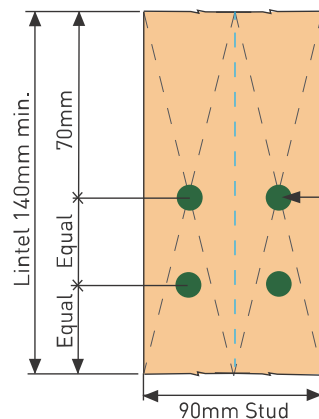
For fixing of Jack Studs
refer to Jack Stud to
Top Plate & Lintel
Fixing brochure

1 x STUD-LOK SL80 (white)
directly below Lintel
OR
Nail as per NZS 3604:2011

Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

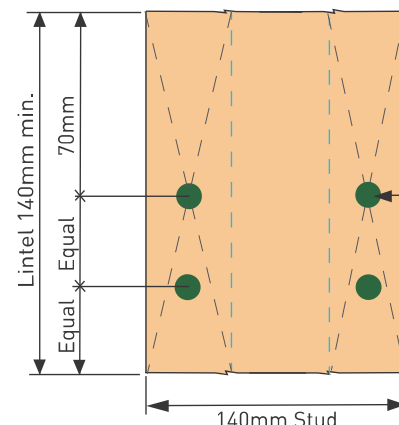
GIB HandiBrac™ with
BOWMAC Screw Bolt M10 x 140mm

Detail 3



STUD-LOK
SL125 (green)

Detail 4



STUD-LOK
SL125 (green)

OR

STUD-LOK SL80
(white)
Trimmer to
Understud at
400mm crs.
OR
Nail as per
NZS 3604:2011

400mm Sheet Brace Strap to one side
6 x 30mm x 3.15 dia. Nails to Stud

3 x 30mm x 3.15 dia. Nails to
Bottom Plate

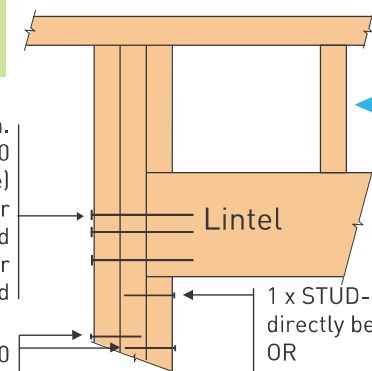
6 x 30mm x 3.15 dia. Nails
to Timber Joist/Bearer

STUD-LOK LINTEL FIXING OPTIONS FOR ON-SITE

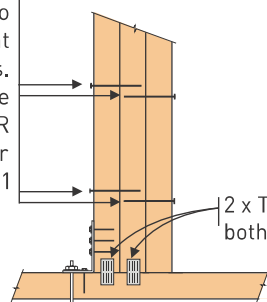
TYPE H 13.5kN

For Lintel 190mm min.
6 x STUD-LOK SL170
(blue)
Refer Detail 5 for
90mm Stud
Refer Detail 6 for
140mm Stud

STUD-LOK SL80
(white)
Trimmer to
Understud at
400mm crs.
both side
OR
Nail as per
NZS 3604:2011

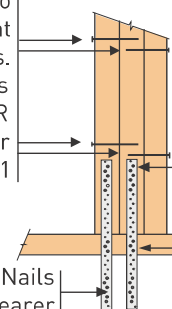


1 x STUD-LOK SL80 (white)
directly below Lintel
OR
Nail as per NZS 3604:2011



OR

STUD-LOK SL80
(white)
Trimmer to
Understud at
400mm crs.
both sides
OR
Nail as per
NZS 3604:2011



6 x 30mm x 3.15 dia. Nails
Timber Joist/Bearer

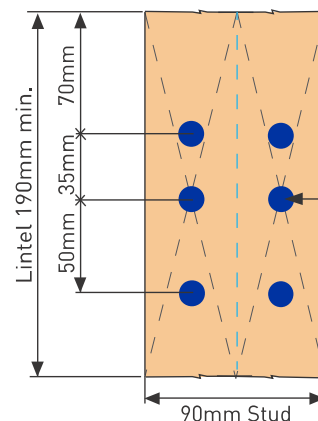
2 x 400mm Sheet Brace Straps to one side
6 x 30mm x 3.15 dia. Nails to Stud

3 x 30mm x 3.15 dia. Nails to
Bottom Plate

For fixing of Jack Studs
refer to Jack Stud to
Top Plate & Lintel
Fixing brochure

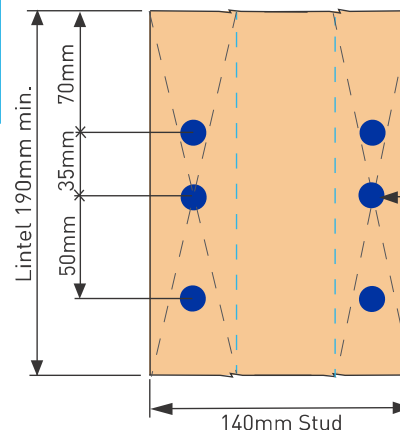
Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

Detail 5



STUD-LOK
SL170
(blue)

Detail 6



STUD-LOK
SL170
(blue)

NOTE: STUD-LOK TYPE F 4.0kN fixing can be used for TYPE E 1.4kN fixing



Correspondence from : **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Botany 2163
Phone: 09 274 7109
Fax: 09 274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03 348 8691
Fax: 03 348 0314

www.mitek.nz.co.nz

MiTek 20/20 Engineering 4.7.346.0

Printed: 07:06:52 07 Jun 2024

PRODUCER STATEMENT for MiTek 20/20[®] TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **PlaceMakers - Frame & Trusses**

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 **252947P** 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 Clause B1 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: Friday, 7 June 2024

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

Job: 252947P

Client: A1 Homes Otago Southland
Phone:Site: A1 Homes
Burgess & Allen
7 Whitehaven St
OamaruDescription:
Building Consent No.:
MiTek 20/20 Engineering 4.7.346.0

Phone:

Printed: 07:06:52 07 Jun 2024

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **PlaceMakers - Frame & Trusses**, 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: DFTNZOH1.2

Roof

Material: Longrun Iron .55mm
Dead Load: 0.210 kPa
Restraints: 900 mm centres
Live Load: Qur = 0.250 kPa
Qc = 1.100 kN

Importance Level : 2

Pitch: 5.000 deg

Ceiling

Material: Rondo on clips
Dead Load: 0.200 kPa
Restraints: 1800 mm centres
Live Load: Qc = 1.400 kN

Design Working Life : 50 years

Nominal Overhang: 600 mm

Wind

Area: High (44.0 m/s)
Pressure Coeff: Cpe = varies; Cpi = -0.30, 0.20

Snow

Location: Oamaru (N4) at 100 m
Open Ground Load: 0.900 kPa
Basic Roof Load: 0.630 kPa

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, ✕ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace required, CF = Chemical Free Treatment

Roof Truss

Treatment: Top Chords - H1.2					Bottom Chords - H1.2					Webs - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
EN01	1D	3850	5.000	900	*R01	2	7800	5.000	255	T03	1	8640	5.000	900
EN02	1D	4880	5.000	900	*R02	2	1730	5.000	255	T04	3	7940	5.000	900
EN03	1D	6600	5.000	900	*R03	2	5140	5.000	255	T05	2	6630	5.000	900
EN04	1D	1820	5.000	900	*R04	2	4390	5.000	255	T05A	1	6630	5.000	900
HT01	1	8330	5.000	900	*R05	10	210	0.000	862	T06	1	5270	5.000	900
HT02	1	8330	5.000	900	*R06	3	210	0.000	843	T07	1	5970	5.000	900
HT03	1	8330	5.000	900	*R07	6	210	0.000	869	T08	1	4880	5.000	900
HT04	1	6025	5.000	900	*R08	7	210	0.000	849	T08A	1	5970	5.000	900
HTG01	1D	4180	5.000	900	*R09	1	13433	3.540	900	T09	1	4180	5.000	900
J01	1	3605	5.000	900	*R10	1	871	5.000	900	T10	1	3605	5.000	900
J01A	1	3605	5.000	900	*R11	1	820	5.000	900	T11	1	1390	5.000	900
J01B	1	3605	5.000	900	T01	6	6600	5.000	900	T11A	1	1390	5.000	900
J02	1	905	5.000	900	T02	4	8330	5.000	900	T12	1	1390	5.000	900

Roof Truss quantity : 76

Total quantity : 76

The computer design input has been carried out by:

Signed: ... 

Name of Detailer: Craig Murphy

On behalf of: PlaceMakers - Frame & Trusses

Date: ...Friday, 7 June 2024....

Qualifications and Title:



Phone:

Printed: 07:13:06 07 Jun 2024

Loads

MiTek® Truss List

Legend: * = detail only. ? = input only. Txx = failed design. Ø = non certified. Unmarked trusses = designed successfully

[illegible]

PlaceMakers - Frame & Trusses

Fixing Report : Page 2

Job: 252947P

Client: A1 Homes Otago Southland

Site:

A1 Homes
Burgess & Allen
7 Whitehaven St
OamaruDescription:
Building Consent No.:
MITek 20/20 Engineering 4.7.346.0

Phone:

Phone:

MITek New Zealand Limited

Printed: 07:13:06 07 Jun 2024

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing -----	
							Qty	Selected
*R11	1	820						
T01	6	6600	J	6.162	3.376	Cross	6	Single CPC40
			P	6.253	3.259	Cross	6	Single CPC40
T02	4	8330	J	2.894	1.219	Cross	4	Single CPC40
			P	4.673	2.140	Cross	4	Single CPC40
			M	7.633	5.011	Cross	4	CT200 pair
T03	1	8640	K	3.014	4.134	Cross	1	CT200 pair
			R	6.992	3.585	Butt	1	JH 47x90
			L	12.431	8.089	Cross	1	CT200 pair
T04	3	7940	K	7.630	4.091	Cross	3	CT200 pair
			R	7.445	3.921	Butt	3	Pair of MultiGrips
T05	2	6630	K	6.603	3.368	Cross	2	Single CPC40
			Q	6.424	4.088	Cross	2	CT200 pair
			I	2.184	1.642	Cross	2	Single CPC40
T05A	1	6630	K	6.599	3.368	Cross	1	Single CPC40
			Q	6.523	4.097	Cross	1	CT200 pair
			I	1.903	1.234	Cross	1	Single CPC40
T06	1	5270	K	5.544	2.668	Cross	1	Single CPC40
			O	5.222	3.187	Cross	1	Single CPC40
			H	0.772	0.777	None		No fixing selected. Specific engineering design required for down and uplift loads.
			I	2.042	1.256	None		No fixing selected. Specific engineering design required for down and uplift loads.
T07	1	5970	J	0.831	1.484	Cross	1	Single CPC40
			N	4.827	3.062	Cross	1	Single CPC40
			K	6.717	4.337	Cross	1	CT200 pair
			H	2.209	1.433	None		No fixing selected. Specific engineering design required for down and uplift loads.
T08	1	4880	I	4.243	2.411	Cross	1	Single CPC40
			M	5.004	3.060	Cross	1	Single CPC40
			H	0.362	0.296	None		No fixing selected. Specific engineering design required for down and uplift loads.
T08A	1	5970	J	5.128	3.015	Cross	1	Single CPC40
			O	5.621	2.946	Cross	1	Single CPC40
T09	1	4180	G	4.765	2.178	Cross	1	Single CPC40
			J	3.399	2.086	Cross	1	Single CPC40
T10	1	3605	G	2.505	1.393	Cross	1	Single CPC40
			F	0.300	0.230	None		No fixing selected. Specific engineering design required for down and uplift loads.
			J	2.116	1.112	Wide		No fixing selected
			I	2.363	1.454	Wide		No fixing selected
			H	2.446	1.194	Wide		No fixing selected
T11	1	1390	F	2.751	1.940	Cross	1	Single CPC40
			H	1.748	1.279	Butt	1	JH 47x90
			E	0.489	0.392	None		No fixing selected. Specific engineering design required for down and uplift loads.
T11A	1	1390	F	2.790	2.023	Cross	1	Single CPC40
			H	0.997	0.567	Butt	1	JH 47x90
T12	1	1390	E	2.716	1.901	Cross	1	Single CPC40
			G	0.749	0.488	Butt	1	JH 47x90
J01A	1	3605	F	3.949	2.075	Cross	1	Single CPC40
			I	2.631	1.817	Butt	1	JH 47x90
HTG01	1D	4180	G	7.681	4.335	Cross	1	CT200 pair
			K	6.956	4.567	Cross	1	CT200 pair

Fixing List

Qty	Selected Fixing
53	Single CPC40
18	CT200 pair
8	JH 47x90
3	Pair of MultiGrips
57	No fixing selected

Note:

- 1) Fixings have been selected based on loading only. Please check that selected fixings are practical for each situation and that appropriate nailing can be applied on site.
- 2) Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data) with down and uplift characteristic loads of at least the values shown for each joint.

Job: 252947P

Client: A1 Homes Otago Southland
Phone:

Site: A1 Homes
Burgess & Allen
7 Whitehaven St
Oamaru

Description:
Building Consent No.:
MiTek 20/20 Engineering 4.7.346.0

Phone:
Printed: 07:13:46 07 Jun 2024

TRUSS BEARINGS EXCEEDING 10KN REPORT -
Ultimate Limit State Loads

MiTek® Truss List

Legend: ? = input only, ✕ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN)	
				Down	Uplift

Note:
1) Select appropriate Slab Thickening Detail from the MiTek 'Internal Load Bearing On Concrete Floor Slabs' brochure.

Placemakers

Job No: 252947P
Job Name: Burgess & Allen

Client: A1 Homes Otago & Southland
Building Consent No:

Site: 7 Whitehaven St Oamaru

PRODUCER STATEMENT
MiTek Beam Program v1.07 April 2012

Certification of MiTek Beam Program v1.07 April 2012

The MiTek Beam Program v1.07 April 2012 has been developed by MiTek New Zealand Ltd for the design of these beams: Timber, Glulam, GANGLAM and GANG-NAIL FLITCH BEAMS. The beam designs calculated by this program 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 to satisfy the requirements of Clause B1 of the Building Code. We believe on reasonable grounds that these beams for the proposed building, if constructed in accordance with the drawings, specifications and other documents provided will comply with the relevant provisions of the NZ Building Code. This is subject to all proprietary products meeting their performance specification requirements; the provision of adequate bracing and fixings; and the correct input of design data carried out by suitably trained personnel.

Summary of MiTek Beam Program v1.07 February 2009 Data and Output

Roof		Wind		Wall	
Weight:	light + ceiling	Area/Speed:	high (44.0 m/s)	Type:	Low weight - 0.57kPa
Dead Load:	0.45 kPa				
Live Load:	0.25 kPa	Snow		Floor	
		Area:	0.63 kPa	Live Load:	NA

Beam List									
Opening Label	Beam Material	Beam Size	Beam Length	Design Status	Opening Label	Beam Material	Beam Size	Beam Length	Design Status
entry Beam	MSG8/MSG8	2/140x45	2430	OKAY					
D01	MSG8/MSG8	2/140x45	1730	OKAY					
w01,w02	MSG8/MSG8	2/140x45	600	OKAY					
w03	MSG8/MSG8	2/140x45	1800	OKAY					
w04	MSG8/MSG8	2/140x45	600	OKAY					
d02	GN Flitch Beam	FB30M	4800	OKAY					
w05	MSG8/MSG8	2/140x45	1000	OKAY					
d03	MSG8/MSG8	2/140x45	2000	OKAY					
w06	MSG8/MSG8	2/140x45	1500	OKAY					
w07	MSG8/MSG8	2/140x45	1200	OKAY					
w08	MSG8/MSG8	2/140x45	1600	OKAY					
d04	MSG8/MSG8	2/140x45	880	OKAY					
w09,w10	MSG8/MSG8	2/140x45	600	OKAY					
d05	GN Flitch Beam	FB30M	4840	OKAY					
w11	MSG8/MSG8	2/140x45	1600	OKAY					
w12	MSG8/MSG8	2/140x45	1000	OKAY					
hall 760	MSG8/MSG8	2/140x45	840	OKAY					
master 760	MSG8/MSG8	2/140x45	840	OKAY					
ensui	MSG8/MSG8	2/140x45	1500	OKAY					
bath 760	MSG8/MSG8	2/140x45	840	OKAY					
store 510	MSG8/MSG8	2/140x45	590	OKAY					
bed 2 760	MSG8/MSG8	2/140x45	840	OKAY					

GANGLAM plating details indicated with RD (regular duty plating), HD (heavy duty plating) and SHD (super heavy duty plating)

The design input has been carried out by:

Signed:.....

Date: 7/06/2024

Name of Computer Operator: Craig Murphy

Qualifications and Title: Detailer

Company: Placemakers

MiTek Beam v1.07 February 2009

Date: Friday, 7 June 2024
Job Number 252947P
Job Name Burgess & Allen
Client A1 Homes Otago & Southland
Calculated By Craig Murphy

Roof Weight light + ceiling
Wind Zone high (44.0 m/s)
Snow Load 0.63 kPa

Beam Details

Beam Label	entry Beam	D01	w01,w02	w03	w04	d02	w05	d03	w06	w07
Beam Span (mm)	2430	1730	600	1800	600	4800	1000	2000	1500	1200
Roof Span "S" (mm)	1400	7940	7940	900	900	7940	5970	1390	3605	3230
Overhang (mm)	600		600	300	300	900	200	900	600	600
Wall Type	NA	NA	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa
Wall Height (mm)			1095	1095	400	300	300	400	400	400
Floor Live load	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Floor Span "F" (mm)										

MiTek Bearing Reactions

Not in use in this version	;									
	r									
	;									
	)									
	)									
	)									
	;									

Point Load 1										
Girder Span (mm)								1390	3605	
Setback (mm)								905	1390	
Location (mm)								45	1405	

Point Load 2										
Girder Span (mm)										
Setback (mm)										
Location (mm)										

Point Load 3										
Girder Span (mm)										
Setback (mm)										
Location (mm)										

Beam Status	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
Beam Material	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	GN Flitch Beam	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8
Beam Size	2/140x45	2/140x45	2/140x45	2/140x45	2/140x45	FB30M	2/140x45	2/140x45	2/140x45	2/140x45
Beam Deflection	3.85mm	3.02mm	0.08mm	2.95mm	0.02mm	5.54mm	0.33mm	3.46mm	1.54mm	0.55mm
Beam Length	2430	1730	600	1800	600	4800	1000	2000	1500	1200

MiTek Beam v1.07 February 2009

Date: Friday, 7 June 2024
Job Number 252947P
Job Name Burgess & Allen
Client A1 Homes Otago & Southland
Calculated By Craig Murphy

Roof Weight light + ceiling
Wind Zone high (44.0 m/s)
Snow Load 0.63 kPa

Beam Details

Beam Label	w08	d04	w09,w10	d05	w11	w12	hall 760	master 760	ensuite 760 cs	bath 760
Beam Span (mm)	1600	880	600	4840	1600	1000	840	840	1500	840
Roof Span "S" (mm)	3230	6600	900	6600	5010	5010	2840	4180	900	8330
Overhang (mm)	600	600	300	600	600					
Wall Type	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	Medium weight - 1.05kPa	NA	NA	NA	NA	NA	NA
Wall Height (mm)	400	400	900	900						
Floor Live load	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Floor Span "F" (mm)										

MiTek Bearing Reactions

Not in use in this version	;									
	r									
	;									
	)									
	)									
	)									
	;									

Point Load 1										
Girder Span (mm)										
Setback (mm)										
Location (mm)										

Point Load 2										
Girder Span (mm)										
Setback (mm)										
Location (mm)										

Point Load 3										
Girder Span (mm)										
Setback (mm)										
Location (mm)										

Beam Status	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
Beam Material	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	GN Flitch Beam	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8
Beam Size	2/140x45	2/140x45	2/140x45	FB30M	2/140x45	2/140x45	2/140x45	2/140x45	2/140x45	2/140x45
Beam Deflection	1.75mm	0.25mm	0.03mm	6.17mm	1.73mm	0.21mm	0.06mm	0.09mm	0.19mm	0.18mm
Beam Length	1600	880	600	4840	1600	1000	840	840	1500	840

MiTek Beam v1.07 February 2009

Date: Friday, 7 June 2024
Job Number 252947P
Job Name Burgess & Allen
Client A1 Homes Otago & Southland
Calculated By Craig Murphy

Roof Weight light + ceiling
Wind Zone high (44.0 m/s)
Snow Load 0.63 kPa

Beam Details

[illegible]

MiTek Bearing Reactions

Not in use in this version

Point Load 1

Girder Span (mm)
Setback (mm)
Location (mm)

Point Load 2

Girder Span (mm)
Setback (mm)
Location (mm)

Point Load 3

Girder Span (mm)
Setback (mm)
Location (mm)

[illegible]



BY ALIDE ELKINK,
FREELANCE TECHNICAL
WRITER, WELLINGTON

Bracing for monopitch roofs

JUDGING BY THE NUMBER OF CALLS TO THE BRANZ HELPLINE, THERE'S SOME CONFUSION AROUND BRACING REQUIREMENTS FOR MONOPITCH ROOFS. HERE, WE SORT OUT THE ISSUE.

THE BRACING REQUIREMENT for monopitch roofs is addressed in NZS 3604:2011 *Timber-framed buildings* paragraph 10.3.4.

Simply stated, it requires that bracing for monopitch roofs must comply with paragraphs 10.3.2 (for light roofs) or 10.3.3 (for heavy roofs), but it also includes an exemption.

Raked wall frames

Paragraph 10.3.4 does *not* require roof plane diagonal bracing if:

- the wall frames extend and are braced up to the underside of the rafters, and
- the ceiling lining is attached directly to the underside of the rafters.

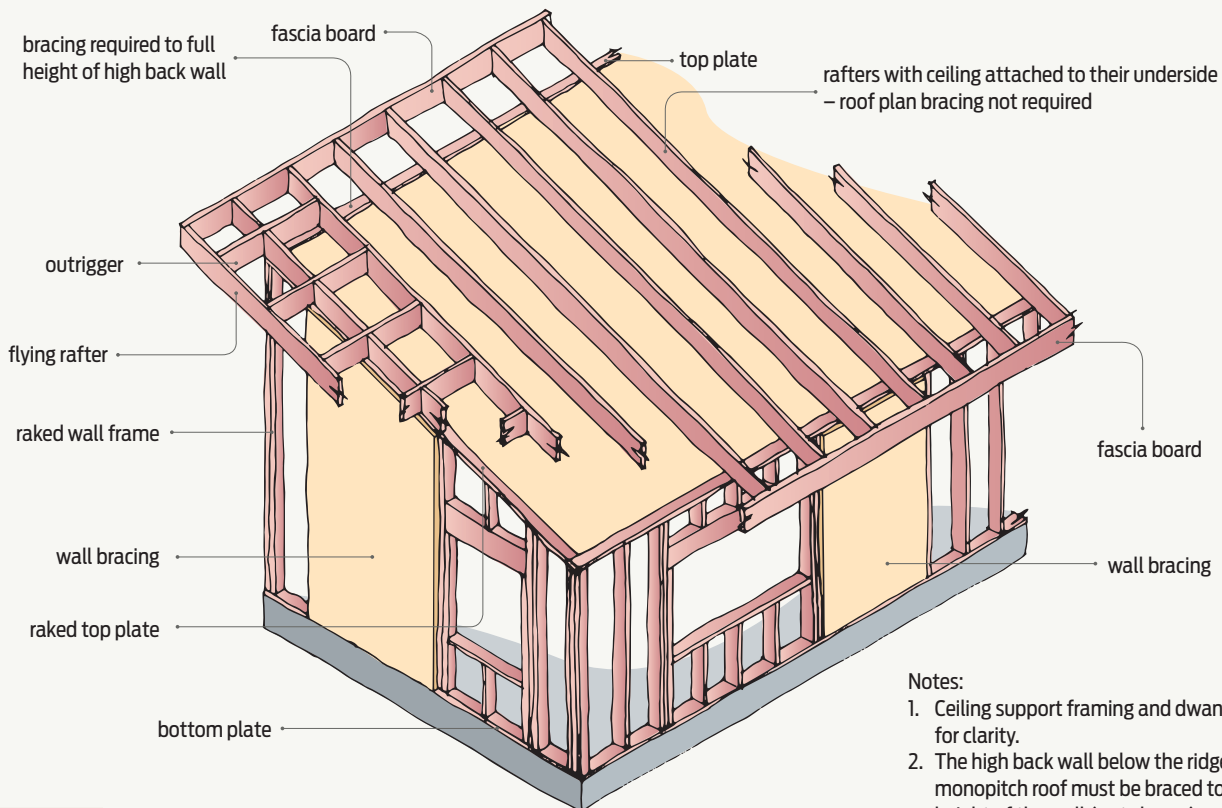
This will only apply where the wall frames are raked (see Figure 1).

Level top plates and trusses

Where the wall frames have level top plates and the roof framing consists of trusses or a strutted roof, either roof plane or roof space

bracing is required in accordance with paragraphs 10.3.2 and 10.3.3 for light and heavy roofs (see Figure 2).

In this case, the highest end of the trusses is considered the ridge line and requires at least two braces over its length. Figure 2 shows both roof plane bracing and roof space bracing as alternatives. ◀



Notes:

1. Ceiling support framing and dwangs omitted for clarity.
2. The high back wall below the ridge of the monopitch roof must be braced to the full height of the wall (not shown).

Figure 1 Monopitch roof with full-height braced walls.

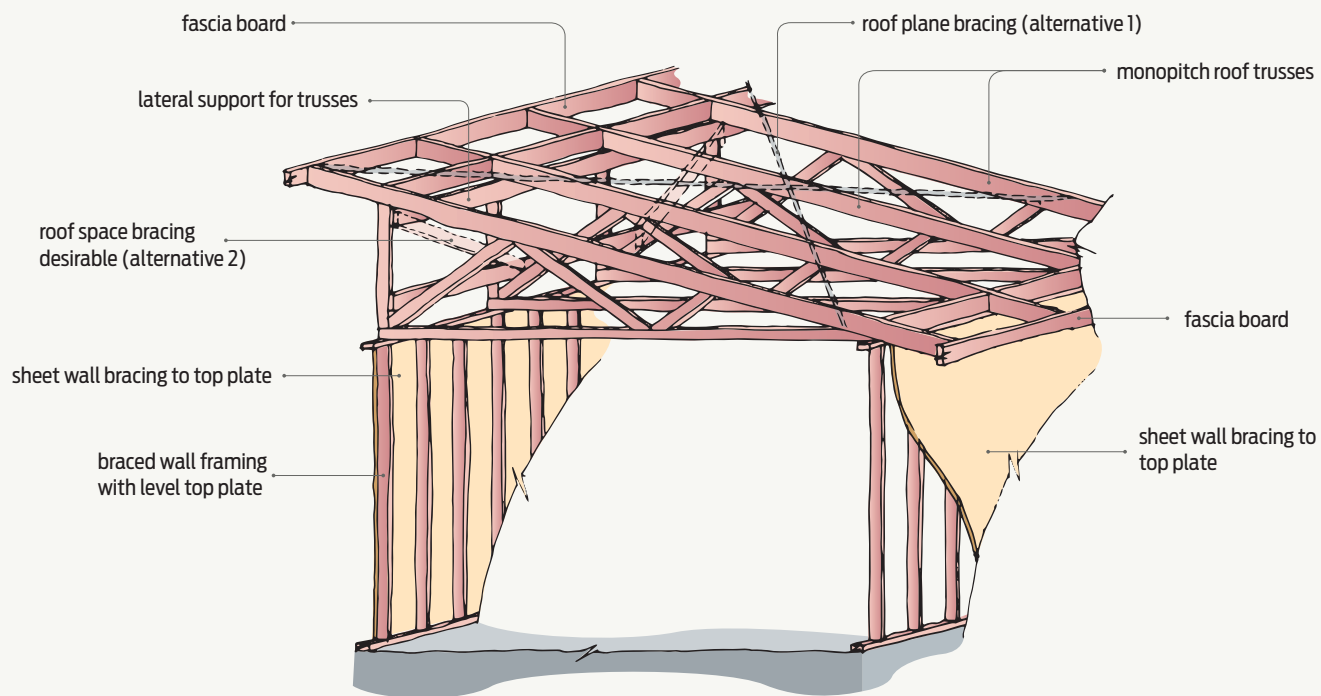


Figure 2 Monopitch truss roof with level top plate.

GABLE END RAKING VERGE OVERHANG OPTIONS



- ★ Covers raking verge using standard purlin overhang options.
- ★ Covers up to 750mm overhang using standard verge outriggers.
- ★ Covers up to 1200mm overhang using verge outrigger/purlin combination.

OVERHANG OPTIONS

- All gable end loading parameters are based on the design considerations used in NZS 3604:2011 and cover heavy roof weight, extra high wind load and snow load S_g of up to 1.0kPa.
- All live load considerations as per AS/NZS 1170.
- All timber to be minimum grade SG8 as defined in NZS 3604:2011.

CANTILEVER PURLIN OPTION

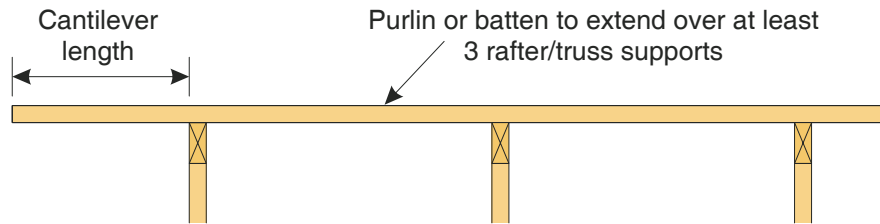


TABLE 1

PURLIN SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	PURLIN CENTRES (mm)
45x45 	200	400
70x45 	300	900
90x45 	450	900

CANTILEVER OUTRIGGER OPTION

(Note: Maximum sidewall overhang of 750mm)
(See details on next pages)

TABLE 2

MAX. CANTILEVER LENGTH 750mm	OUTRIGGER SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	OUTRIGGER CENTRES (mm)
	70x45 	750	600
		600	900
	90x45 	750	900
		600	1200
	90x45 	750	400
		600	600

CANTILEVER OUTRIGGER/PURLIN COMBINATION OPTION

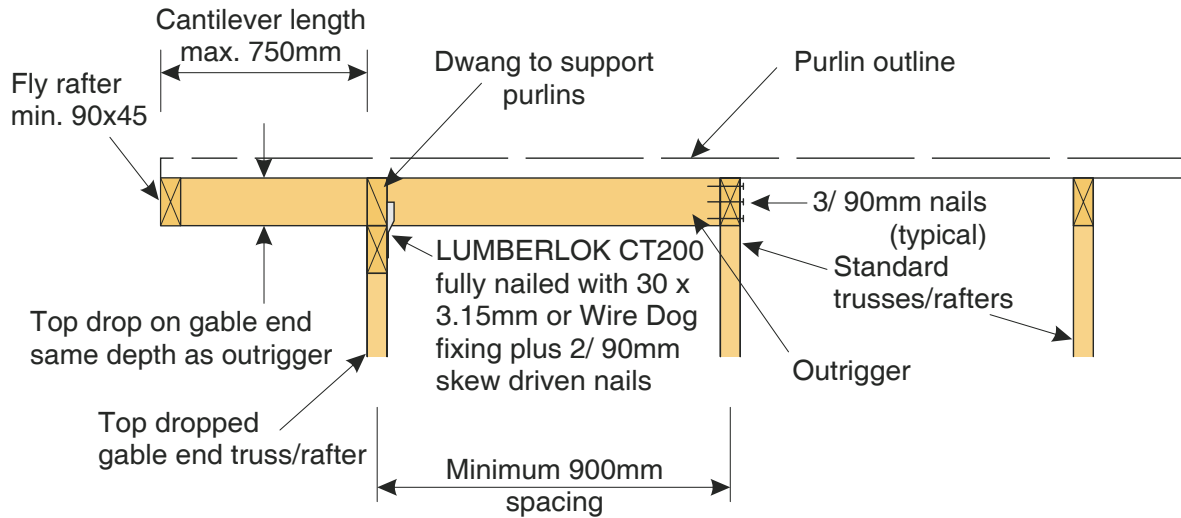
(Note: Maximum sidewall overhang of 1200mm)
(See details on next pages)

TABLE 3

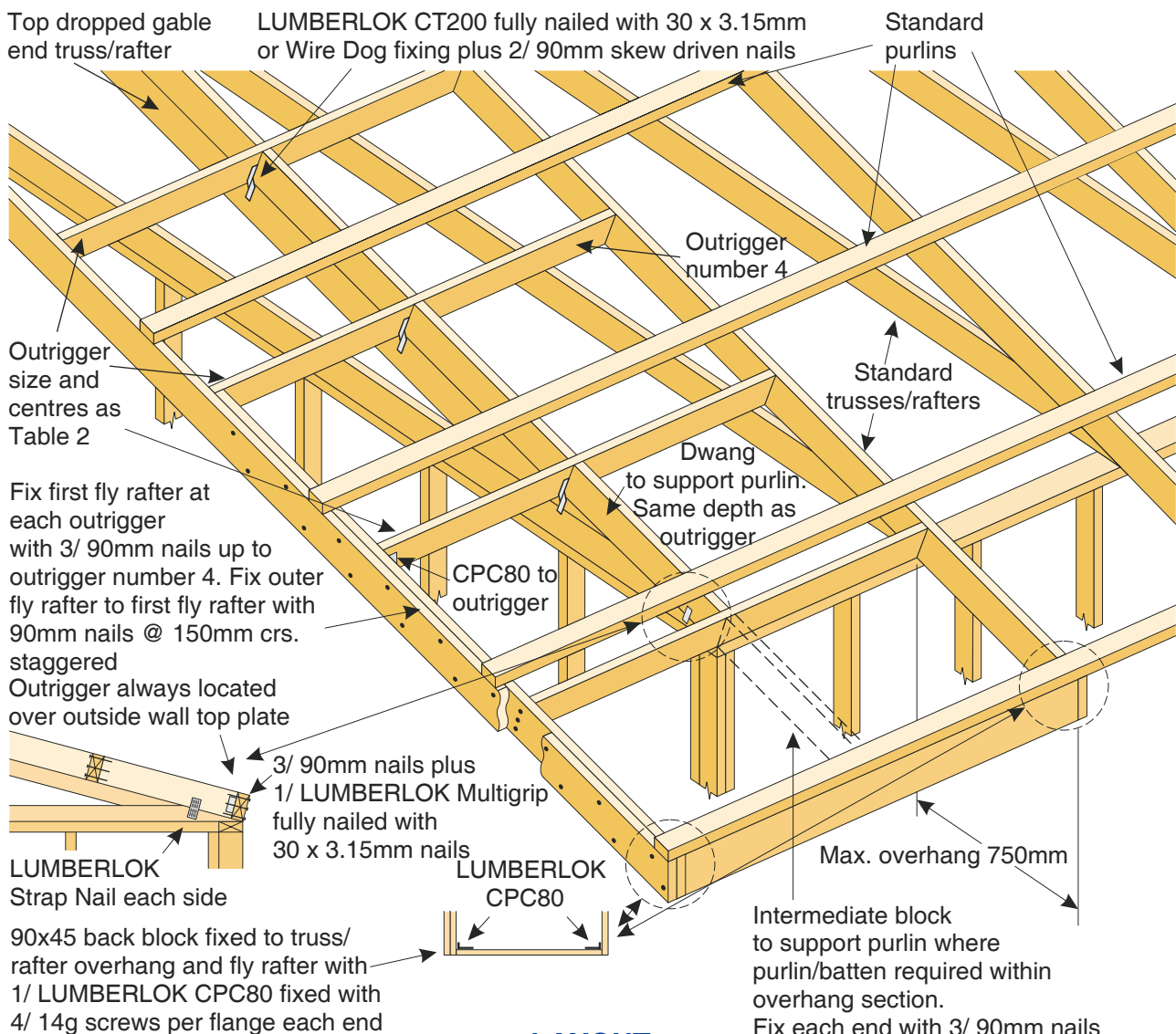
MAX. CANTILEVER LENGTH 1200mm	OUTRIGGER SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	OUTRIGGER CENTRES (mm)
	45x45 Purlin 90x45 Outrigger 	1200	450
	70x45 Purlin 90x45 Outrigger 	1200	700
	90x45 Purlin 90x45 Outrigger 	1200	900

CONSTRUCTION DETAILS FOR CANTILEVER OUTRIGGER OPTION

(SPANS & CENTRES AS PER TABLE 2)



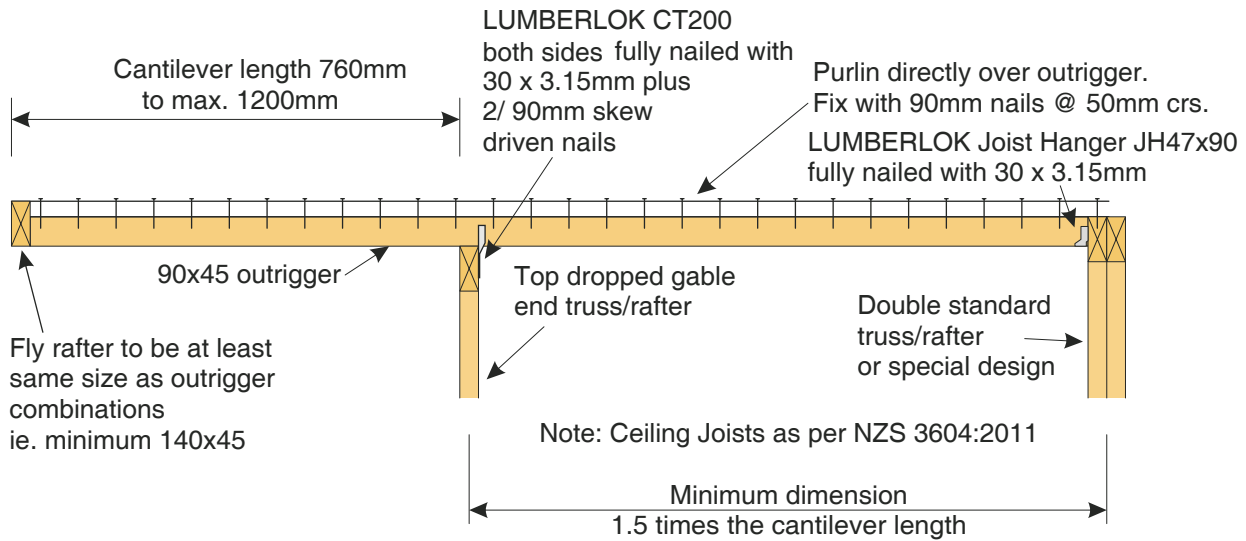
CROSS SECTION



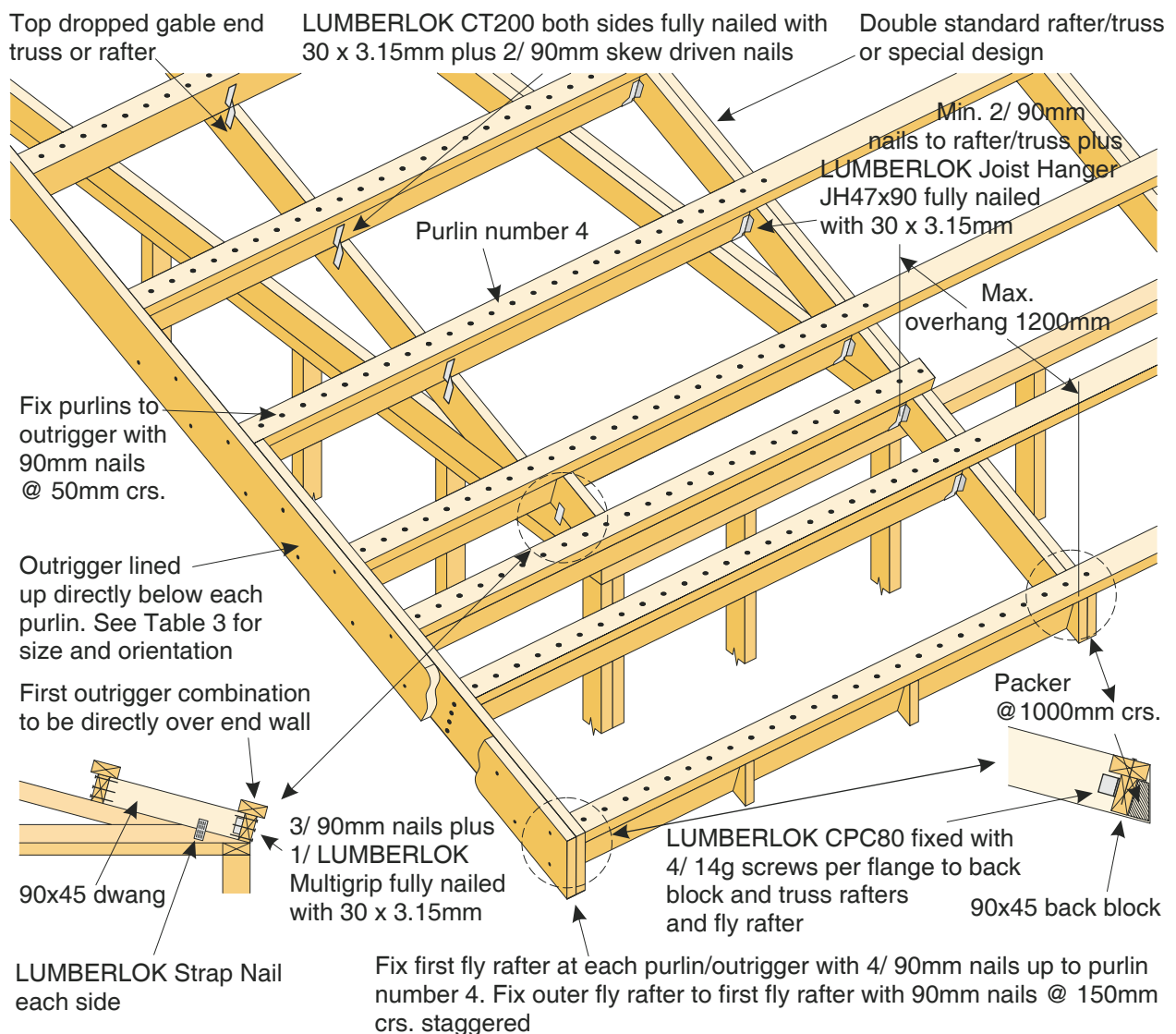
LAYOUT

CONSTRUCTION DETAILS FOR OUTRIGGER/PURLIN COMBINATION

(SPANS & CENTRES AS PER TABLE 3)



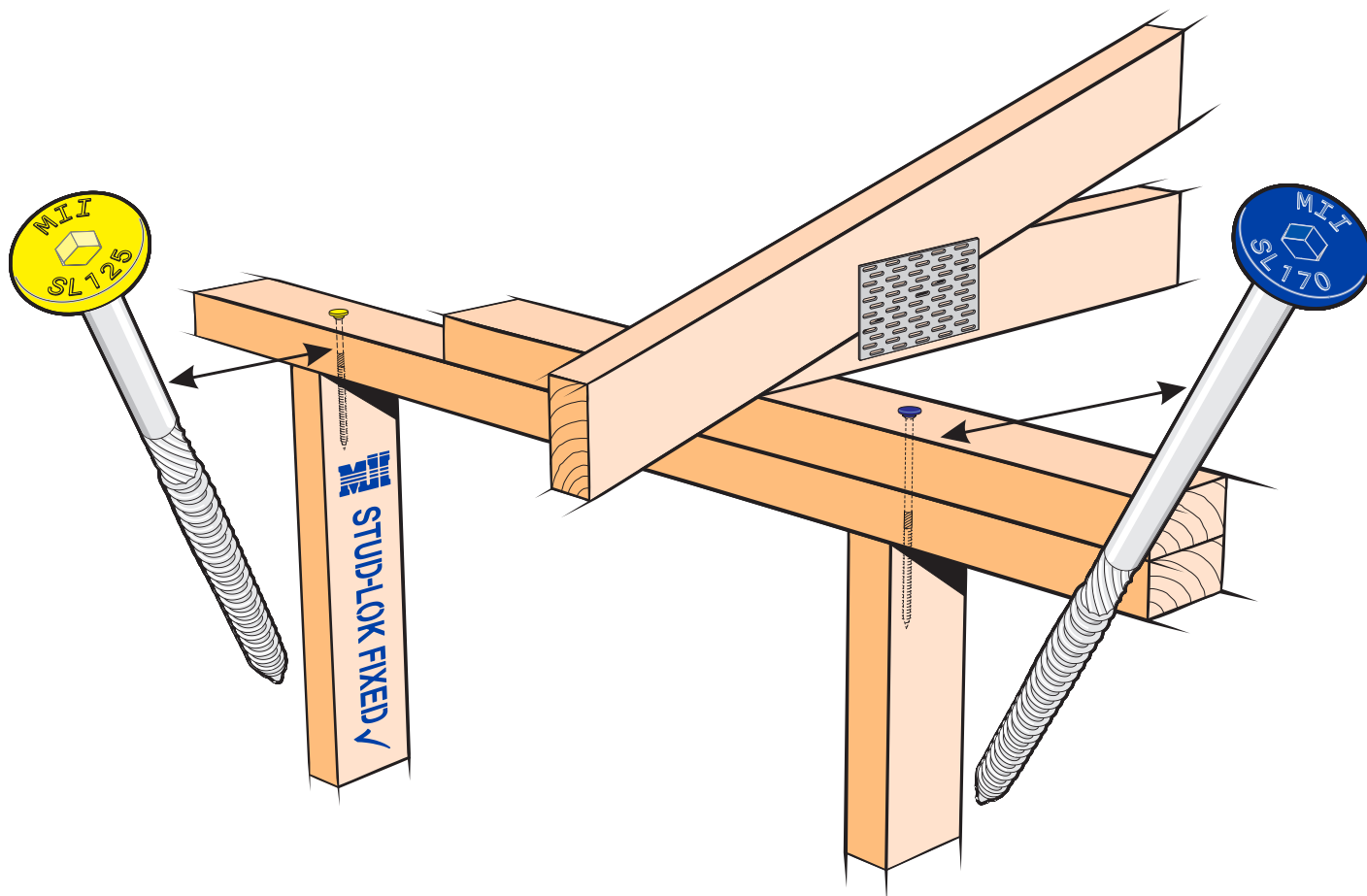
CROSS SECTION



LAYOUT

STUD-LOK

Provides a solution for top plate to stud fixings for residential timber frame buildings



- ★ Complies with fixing requirements in Section 8 NZS 3604:2011
- ★ The BOWMAC® STUD-LOK forms an integral part of the MiTek Truss & Frame design and layout
- ★ Available in 2 lengths allowing for connections from stud to single top plate (SL125) and stud to double top plates (SL170)
- ★ Can be applied in the factory or on-site
- ★ Is a completely internal connection avoiding any clashes with wall linings

Code: SL125-500
Packed: 500 per Carton

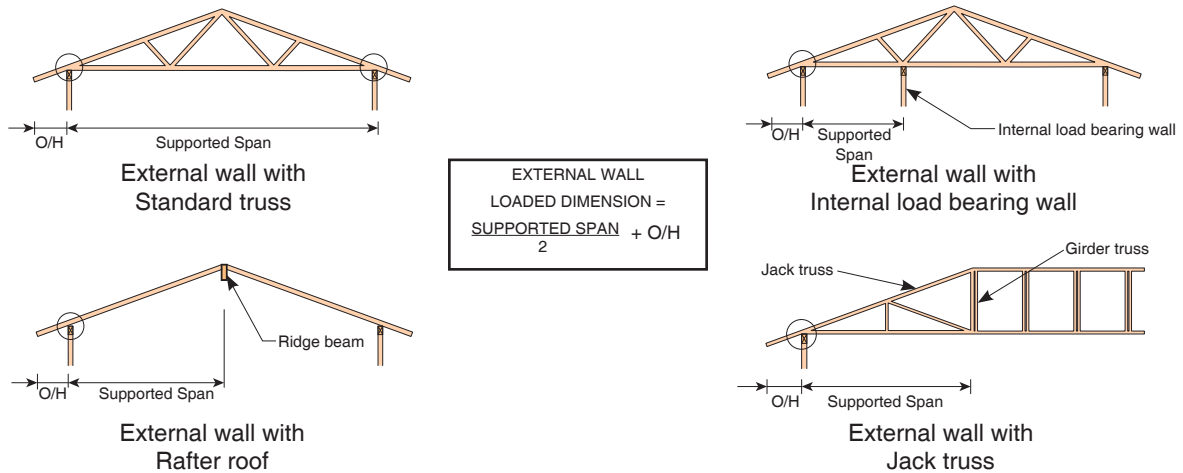
Code: SL170-200
Packed: 200 per Carton

- NOTE:** ★ The STUD-LOK fixing is designed to resist vertical loads only.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ The STUD-LOK connections assume that the correct choice of rafter/truss fixings have been made.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011 and include LVL8 timber grades.

DOUBLE TOP PLATES DEFINITION



LOAD 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	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
4.0	3.0	2.0	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
5.0	3.8	2.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
6.0	4.5	3.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
7.0	5.3	3.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
8.0	6.0	4.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
9.0	6.8	4.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
10.0	7.5	5.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
11.0	8.3	5.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
12.0	9.0	6.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL

2N = 2/ 90mm x 3.15 dia. nails

SL = Single STUD-LOK
plus 2/ 90mm x 3.15 dia. nails

NOTE:

To calculate the number of STUD-LOK 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.

TOP PLATE TO STUD FIXING OPTIONS

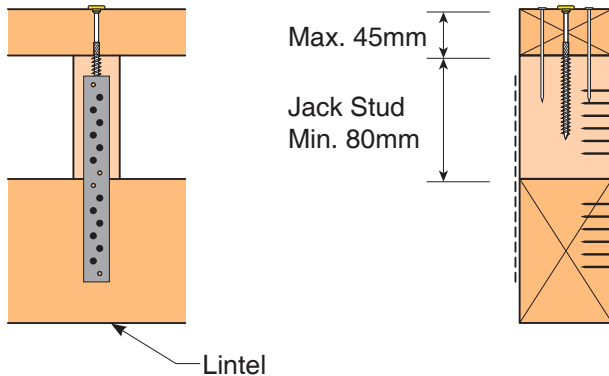
STUD-LOK SL125 - Yellow Head

Fix through single top plate

1. Full length stud option



2. Jack stud option



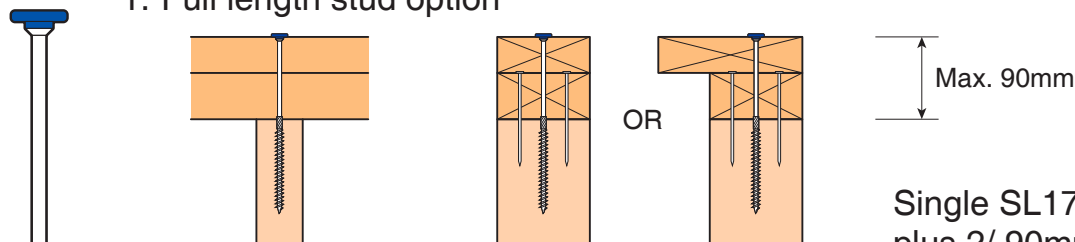
Single SL125
plus 2/ 90mm x 3.15 dia. nails

Note: Connect jack stud to lintel with LUMBERLOK® Sheet Brace Strap 200mm on one side with 6 x LUMBERLOK® Product Nails 30mm x 3.15 dia. each end, **OR** a pair of Tylok 6T5 (one each side)

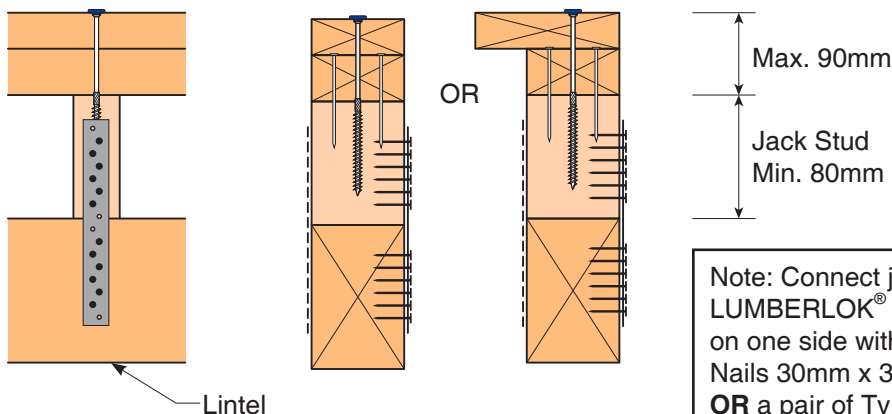
STUD-LOK SL170 - Blue Head

Fix through very top plate or capping plate

1. Full length stud option



2. Jack stud option

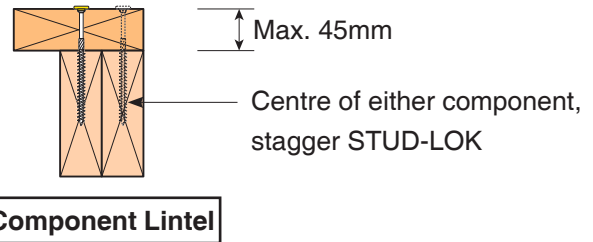
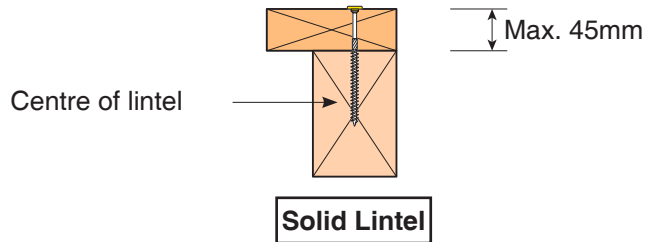
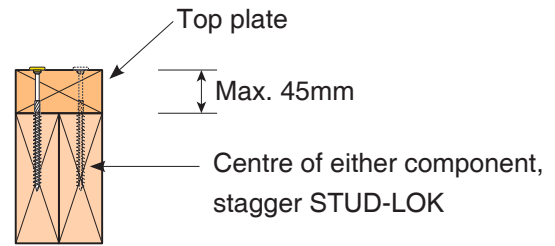
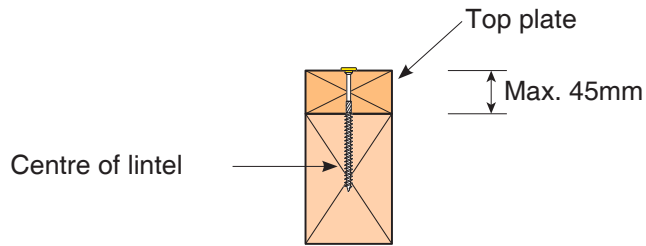


Single SL170
plus 2/ 90mm x 3.15 dia. nails

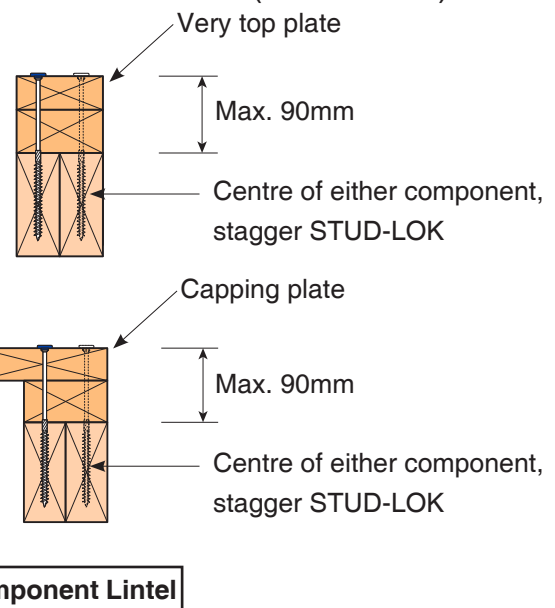
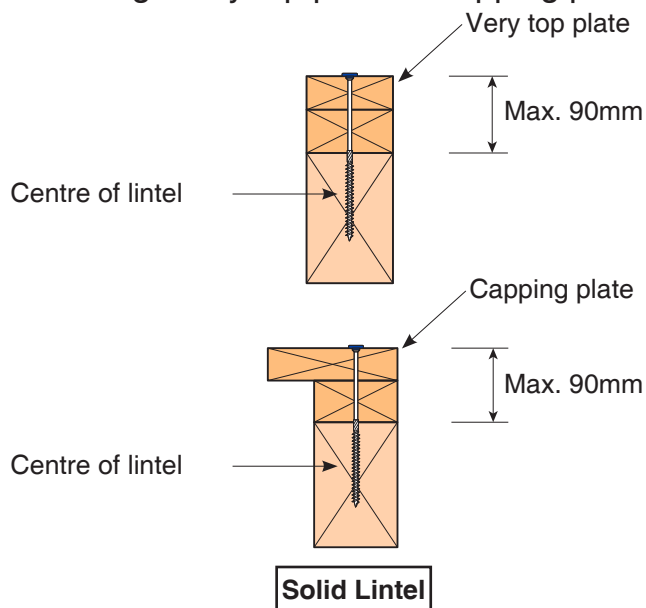
Note: Connect jack stud to lintel with LUMBERLOK® Sheet Brace Strap 200mm on one side with 6 x LUMBERLOK® Product Nails 30mm x 3.15 dia. each end, **OR** a pair of Tylok 6T5 (one each side)

TOP PLATE DIRECT TO LINTEL FIXING OPTIONS

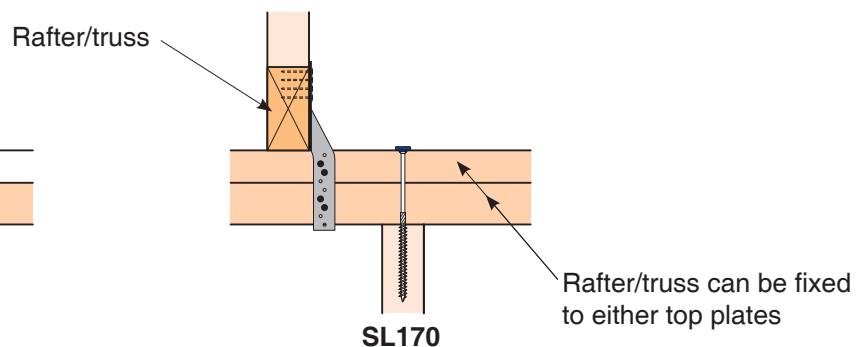
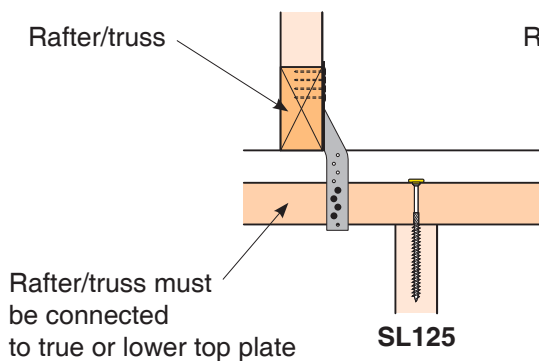
Fix through single top plate using STUD-LOK SL125 (@ stud crs.)



Fix through very top plate or capping plate using STUD-LOK SL170 (@ stud crs.)



RAFTER/TRUSS TO TOP PLATE CONNECTIONS





Demand Calculation Sheet

Job Details

Name: OS1150
Street and Number: 7 Whitehaven Street, Oamaru
Lot and DP Number: Lot 4 DP 585523
City/Town/District: Waitaki District Council
Designer: AK
Company: Idesign Architecture Ltd.
Date: Wednesday, 5 June 2024

Building Specification

Number of Storeys 1
Floor Loading 2 kPa
Foundation Type Slab

Single

Cladding Weight Light
Roof Weight Light
Room in Roof Space No
Roof Pitch (degrees) 5
Roof Height above Eaves (m) 1.075
Building Height to Apex (m) 3.95
Ground to Lower Floor (m) 0.25

Average Stud Height (m) 2.42
Building Length (m) 18.38
Building Width (m) 15.14
Building Plan Area (m²) 187.38

Building Location

Wind Zone = High
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	625	633

Bracing Units required for Earthquake

	Along & Across
Single Level	474

Single Level Along Resistance Sheet

Job Name: OS1150

									Wind	EQ
									Demand	
									625	474
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1684 269%	1507 318%
A	1	1.25		2.42	GS1-N	GIB®	86	74		
	2	1.25		2.42	GS1-N	GIB®	86	74		
	3	0.70		2.42	GS1-N	GIB®	41	41		
	4	0.70		2.42	GS1-N	GIB®	41	41		
	5	1.20		2.42	GS1-N	GIB®	82	71		
External Length = 18.38									335 OK	302 OK
B	1	4.70		2.42	GS1-N	GIB®	322	280		
	2	2.10		2.42	GS1-N	GIB®	144	125		
									465 OK	405 OK
C	1	0.75		2.42	GS1-N	GIB®	45	44		
	2	1.52		2.42	GS1-N	GIB®	104	90		
	3	0.70		2.42	GS1-N	GIB®	41	41		
	4	0.70		2.42	GS1-N	GIB®	41	41		
	5	0.52		2.42	GS1-N	GIB®	29	30		
	6	0.47		2.42	GS1-N	GIB®	25	27		
External Length = 11.05									284 OK	273 OK
D	1	3.76		2.42	GS1-N	GIB®	257	224		
	External Length = 1.4								257 OK	224 OK
E	1	3.16		2.42	GS1-N	GIB®	216	188		
	2	0.98		2.42	GS1-N	GIB®	63	58		
	3	0.98		2.42	GS1-N	GIB®	63	58		
External Length = 8.73									342 OK	304 OK

Single Level Across Resistance Sheet

Job Name: OS1150

									Wind	EQ
									Demand	
									633	474
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1582 250%	1420 299%
M	1	0.80		2.42	GS1-N	GIB®	48	47		
	2	1.20		2.42	GS1-N	GIB®	82	71		
	3	0.75		2.42	GS1-N	GIB®	45	44		
	4	1.16		2.42	GS1-N	GIB®	78	69		
	5	1.38		2.42	GS1-N	GIB®	94	82		
External Length = 14.44									348 OK	313 OK
N	1	2.02		2.42	GS1-N	GIB®	138	120		
	2	1.00		2.42	GS1-N	GIB®	64	59		
	3	0.70		2.42	GS1-N	GIB®	41	41		
External Length = 0.7									244 OK	220 OK
O	1	2.35		2.42	GS1-N	GIB®	161	140		
	2	1.57		2.42	GS1-N	GIB®	107	93		
	3	0.40		2.42	GS1-N	GIB®	21	23		
	4	2.20		2.42	GS1-N	GIB®	151	131		
	5	0.40		2.42	GS1-N	GIB®	21	23		
External Length = 6.81									461 OK	410 OK
P	1	1.20		2.42	GS1-N	GIB®	82	71		
	2	3.83		2.42	GS1-N	GIB®	262	228		
External Length = 1.73									344 OK	299 OK
Q	1	0.61		2.42	GS1-N	GIB®	35	35		
	2	0.60		2.42	GS1-N	GIB®	34	35		
	3	1.20		2.42	GS1-N	GIB®	82	71		
	4	0.61		2.42	GS1-N	GIB®	35	35		
External Length = 6.6									185 OK	177 OK



Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
CHH	EP1_0.4	0.4	80	95
CHH	EP1_0.6	0.6	95	105
CHH	EP1_1.2	1.2	120	135
CHH	EPG_0.4	0.4	100	115
CHH	EPG_1.2	1.2	150	150
Engineer designed	Portal	4.84	150	150

DESIGN CERTIFICATE

Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey LVL Limited (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code (NZBC), provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

Futurebuild LVL and SG8 components, when used and treated to the required treatment levels prescribed in NZS 3602 and NZS 3604, as modified by Acceptable Solution B2/AS1, will comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

References:

1. NZS 3603:1993 Timber Structures Standard.
2. NZS 3604:2011 Timber-framed buildings.
3. AS/NZS 1170.0 - 2002 Structural design actions, Part 0: General principles.
4. AS/NZS 1170.1 - 2002 Structural design actions, Part 1: Permanent, imposed and other actions.
5. AS/NZS 1170.2 - 2021 Structural design actions, Part 2: Wind actions.
6. AS/NZS 1170.3 - 2003 Structural design actions, Part 3: Snow and ice actions.
7. AS 1720.1 - 2010 Timber structures. Part 1: Design methods.
8. AS 1720.3:2016 Timber structures. Part 3: Design criteria for timber-framed residential buildings.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 13 May, 2024

For further information or advice contact:

Carter Holt Harvey LVL Limited,
173 Captain Springs Road, Onehunga. Auckland
Telephone: 0800 808 131
Email: designit@futurebuild.co.nz
Web: <https://futurebuild.co.nz/>

Specifier details:

Specifier:	Candice
Business name:	IDesign Architecture
Email:	candice@idesignarchitecture.co.nz

Project and site details:

Project:	OS1150
Site address:	
Design wind zone	High
Snow loading	Design snow zone: N5, Altitude: 80 m (sub-alpine), Ground snow load, $S_g^{1,2} = 0.9$ kPa

1. designIT does not include any allowance for the effects of drifting and sliding of snow.
2. Snow loads are applied to roofed over structures only, the design of exposed floors/decks are not covered by designIT.

MEMBER DESIGN DETAILS

Member 1

- 1) **Member code and description** JS1 - Jamb studs - In single or upper storey load bearing walls
- 2) **Date prepared** 19 June 2024

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

4) Design inputs

Opening width	4840 mm
Stud height	2420 mm
Roof type and mass	Light roof and ceiling - 40 kg/m ²
Roof load width 'RLW'	3.9 m
Roof snow load	0.6 kPa ($\mu_i=0.7$, $C_e=1.0$)

5) Member specification

Size, stress grade/product	Use 2/90 x 45 hyCHORD
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Wind load - W_s^*	16.1 mm	10.7 mm	1.5

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1^1	Limit States Design Reaction ^{2,3}	
		End kN ⁴	Horizontal kN
1.35G	0.60	-5.7	
1.2G + 1.5Q	0.80	-9.1	
1.2G + S_u + $\Psi_c Q$	0.80	-12.0	
1.2G + W_u + $\Psi_c Q$	1.00	-14.9	2.4
0.9G + W_u	1.00	2.4	1.9

8) Installation requirements

- Jamb studs to be nogged at maximum 1350 mm
- Notching of the jamb studs not permitted
- Nail Laminate studs in accordance with NZS 3604 Clause 2.4.4.7
- Provide 1 full length stud plus 1 secondary Jamb Stud to Detail H19

Member 2

1) Member code and description JS2 - Jamb studs - In single or upper storey load bearing walls

2) Date prepared 19 June 2024

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

4) Design inputs

Opening width	4840 mm
Stud height	2420 mm
Roof type and mass	Light roof and ceiling - 40 kg/m ²
Roof load width 'RLW'	5.0 m
Roof snow load	0.6 kPa ($\mu_i=0.7$, $C_e=1.0$)

5) Member specification

Size, stress grade/product	Use 2/140 x 45 hyCHORD
----------------------------	------------------------

Material type

Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Wind load - W_s *	16.1 mm	2.8 mm	5.7

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1 ¹	Limit States Design Reaction ^{2,3}	
		End kN ⁴	Horizontal kN
1.35G	0.60	-7.3	
1.2G + 1.5Q	0.80	-11.6	
1.2G + S_u + $\Psi_c Q$	0.80	-15.3	
1.2G + W_u + $\Psi_c Q$	1.00	-19.0	2.4
0.9G + W_u	1.00	3.1	1.9

8) Installation requirements

- Jamb studs to be nogged at maximum 1350 mm
- Notching of the jamb studs not permitted
- Nail Laminate studs in accordance with NZS 3604 Clause 2.4.4.7
- Provide 1 full length stud plus 1 secondary Jamb Stud to Detail H19

Member 3

1) Member code and description

VB1 - Verandah beams

2) Date prepared

19 June 2024

3) Serviceability criteria

AS 1720.1: 2010 and AS 1720.3: 2016

4) Design inputs

Span	2.4 m - single span
Roof mass	30 kg/m ²
Roof load width 'RLW'	1.4 m
Roof snow load	0.6 kPa, snow overhang 0.1 kN/m ($\mu_i=0.7$, $C_e=1.0$, $k=0.5$)

5) Member specification

Size, stress grade/product	Use 2/190 x 45 SG8
Material type	Dry softwood, machine stress graded and verified (NZS 3622)
Assumed design density	< 480 kg/m ³

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Long term load - $G + \Psi_{LQ}$ *	6.0 mm	1.4 mm (long term)	4.3
Live load - $\Psi_s Q$	9.6 mm	0.4 mm	22.0
Wind load - W_s	12.0 mm	1.9 mm	6.3
Snow load - S_s	6.0 mm	0.9 mm	6.4

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1^1	Limit States Design Reaction ^{2,3}
		End kN ⁴
1.35G	0.60	-1.1
1.2G + 1.5Q	0.80	-1.7
1.2G + S_u + $\Psi_c Q$	0.80	-2.4
1.2G + W_u + $\Psi_c Q$	1.00	-3.3
0.9G + W_u	1.00	2.8

8) Installation requirements

- Provide at least 30 mm bearing at end supports
- Vertical lamination required - refer AS 1684

Notes for interpretation of serviceability data

1. 'average deflection' is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720.
2. Deflection is the flexural response to load 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

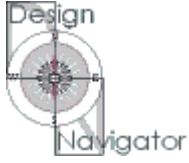
No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!

3. The limits referred are those specified in AS 1720.3 for the stated load case.
4. 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements detailed.

Notes for interpretation of reaction data

1. Duration of load factor ' k_1 ' for strength as per NZS 3603:1993
2. Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
4. End reaction includes allowance for overhang/cantilever where one has been designed



Design Navigator H1 Compliance Report

Project Summary

H1 Report created by:	i design architecture
Project Name:	OS1150
Client:	Burgess & Allen
Lot No:	Lot 4
Comment:	
Project Id:	184444
Report Date:	05/06/2024

Compliance Result

This report shows compliance of the design with Clause H1 AS1 Fifth Edition from 4 August 2022 and the R-value targets of Clause E3 Second edition Amendment 7 from 5 November 2020.

This building **complies with Clause H1 AS1 Edition 5 Amendment 1 for all housing, and buildings up to 300m².**

In order to comply with Clause H1 the building needs to comply with at least one of the three compliance paths (Schedule, Calculation or Modelling Method). This design complies with the Calculation Method.

The building **complies** with Clause E3 Second Edition Amendment 7 from 5 November 2020.

* Note that all floor, wall and roof R-values are rounded to 1 decimal point, window and skylight R-values are rounded to 2 decimal points.

H1 Compliance Details

H1 AS1 Edition 5 - Calculation Method Compliance

The use of the Calculation Method is **permitted** because the vertical glazing area is **smaller** than 40% of the gross wall area.

In order to comply the heat loss of the proposed building must not be larger than the reference building heat loss AND all component R-values must be at least 50% of the R-values shown in the '50% Rule' table below. This design **complies** with the H1 Calculation Method.

HeatLoss:

Maximum permitted Heat Loss	Proposed Building Heat Loss	
250 W/°C	249 W/°C	✓

The reference building element areas and R-values are shown below. The last column shows the element areas of the proposed building.

Element	Reference Building Area	Reference Building R-value	Proposed Building Area
Roof	148.6 m ²	6.6	148.6 m ²
Wall	103.1 m ²	2.0	114.5 m ²
Slab Floor	148.6 m ²	1.7	148.6 m ²
Other Floor	0.0 m ²	3.0	0.0 m ²
Window and Door	44.2 m ²	0.50	32.8 m ²
Skylight	0.0 m ²	-	0.0 m ²

Minimum R-values ("50% rule"):

Element Type	Minimum permitted R-value	Minimum proposed R-value	
Roof	3.3	4.2	✓
Wall	1.0	2.3	✓
Slab Floor	0.9	1.5	✓
other Floor	1.5		✓

Lighting Power Density Compliance

Residential buildings are not required to comply with the lighting power density targets.

Compliance with Clause E3

This building **complies** with Clause E3 Second Edition Amendment 7 from November 2020.

Building Element	Minimum permitted R-value	Minimum project R-value	
Light timber frame wall or other framed wall constructions with cavities	1.5	2.3	✓
Single skin normal weight masonry based wall construction without a cavity	0.6		
Solid timber wall systems no less than 60 mm thick	0.6		
Roof or ceilings of any construction	1.5	4.2	✓

Design Details

Climate	
Location	Waitaki District (true left of the Otekaieke river)
Climate Zone	6
Building Dimensions	
Total Floor Area	148.6 m ²
Slab Floor Area	148.6 m ²
Other Floor Area	0.0 m ²
Gross Wall Area	147.3 m ²
Net Wall Area	114.5 m ²
North Wall Area	33.4 m ²
East, South and West Wall Area	81.1 m ²
Window Area	32.8 m ²
North Window Area	3.6 m ²
East, South and West Window Area	29.2 m ²
Opaque Door Area	0.0 m ²
Gross Roof Area	148.6 m ²
Net Roof Area	148.6 m ²
Skylight Area	0.0 m ²
Glazing Areas	
Total Window Percentage	22.3 %
Total Windows over 30%	no
Total Windows over 40%	no
East, South and West Window Percentage	26.5 %
East, South and West Windows over 30%	no
Skylight Area over 1.5m ²	no
Skylight Percentage	0.0 %
Skylight Area over 1.5%	no
Opaque Door Area over 6m ²	no
Opaque Door Percentage	0.0 %
Opaque Door Area over 6%	no

Heat Loss Details

ID	Name	Orient.	Width	Height	Gross Area	Net Area	R	Heat Loss	Type	Heated	Construction
<u>Floors</u>											
F1					148.6	148.6	1.52	97.8	slab		Floortype 1
<u>Walls</u>											
W1		N	13.91	2.42	33.7	30.0	2.32	12.9			Linea Weatherboard (90mm wall)
Wi1-1			1.50	0.50		0.8	0.50	1.5			Windows
Wi1-2			1.20	0.80		1.0	0.50	1.9			Windows
Wi1-3			1.60	1.20		1.9	0.50	3.8			Windows
W2		N	1.40	2.42	3.4	3.4	2.33	1.5			Vertical Oblique (90mm wall)
W3		E	6.60	2.42	16.0	14.5	2.27	6.4			Garage wall
Wi3-1			0.76	2.00		1.5	0.34	4.5			Garage door
W4		E	8.54	2.42	20.7	14.8	2.33	6.4			Vertical Oblique (90mm wall)
Wi4-1			1.73	2.00		3.5	0.50	6.9			Windows
Wi4-2			0.60	2.00		1.2	0.50	2.4			Windows
Wi4-3			0.60	2.00		1.2	0.50	2.4			Windows
W5		S	10.13	2.42	24.5	21.2	2.32	9.1			Linea Weatherboard (90mm wall)
Wi5-1			0.60	2.00		1.2	0.50	2.4			Windows
Wi5-2			1.80	1.20		2.2	0.50	4.3			Windows
W6		S	5.18	2.42	12.5	8.6	2.33	3.7			Vertical Oblique (90mm wall)
Wi6-1			1.00	2.00		2.0	0.50	4.0			Windows
Wi6-2			1.60	1.20		1.9	0.50	3.8			Windows
W7		W	8.01	2.42	19.4	14.4	2.32	6.2			Linea Weatherboard (90mm wall)
Wi7-1			2.00	2.00		4.0	0.50	8.0			Windows
Wi7-2			1.00	0.95		0.9	0.50	1.9			Windows
W8		W	7.13	2.42	17.3	7.7	2.85	2.7			Linea Weatherboard (140mm wall)
Wi8-1			4.80	2.00		9.6	0.50	19.2			Windows
<u>Roofs</u>											
R1					148.6	148.6	4.23	35.1	perimeter		Rooftype 1
<u>Total Heat Loss</u>								248.9			

* The floor and roof heatlosses are not included in the heatloss equation for commercial buildings (H1/AS2).

Floor Construction Details

Name: Floortype 1 Slab Floor ☒ heated ☐ 1.52 m²°C/W

Type: Floor: Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Table F Slab Insulation (H1 Edition 5)
- [H1 Acceptable Solutions and Verification Methods](#)

Slab floor area [m²]: 148.64

Area Perimeter Ratio: 2.44

Underslab insulation: Full ▾ Insulation : 1.32

Perimeter:

	<i>Length*</i>	<i>Masonry Veneer Wall</i>	<i>External Wall Thickness*</i>	<i>Edge Insulation</i>
-	60.90 m	☐	90 mm	☐
+				

* required data. If empty the perimeter type will be ignored.

Wall Construction Details

Name: Linea Weatherboard (90mm wall) heated ☐ 2.32 m²°C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : James Hardie Linea weatherboard ▾	R-value: 0.08
Air Barrier : generic - Building paper ▾	
R-value: 0.01	
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm ▾	
Wall Frame Area: 14.4%	Cavity Area: 85.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : R-value: 0.75	Pink(c)Batts(c) Ultra R2.8 90mm Wall 2.8
still Airgap: none ▾ R-value: 0.00	
Wall Lining : generic - gypsum Plasterboard 10mm ▾	
R-value: 0.04	
internal surface 0.09	

Name:

Linea Weatherboard (140mm wall)

heated ☐2.85
m²°C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : James Hardie Linea weatherboard ▼ R-value: 0.08	
Air Barrier : generic - Building paper ▼ R-value: 0.01	
Timber Frame & Cavity : 140mm, studs @ 600mm, dwangs @ 800mm ▼	
Wall Frame Area: 14.4%	Cavity Area: 85.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : R-value: 1.17	Pink(c)Batts(c) Ultra R3.2 140mm Wall 3.2
	still Airgap: none ▼ R-value: 0.00
Wall Lining : generic - gypsum Plasterboard 10mm ▼ R-value: 0.04	
internal surface 0.09	

Name:

Vertical Oblique (90mm wall)

heated ☐2.33
m²°C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : James Hardie Oblique weatherboard ▼ R-value: 0.11	
Air Barrier : generic - Building paper ▼ R-value: 0.01	
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm ▼	
Wall Frame Area: 14.4%	Cavity Area: 85.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : R-value: 0.75	Pink(c)Batts(c) Ultra R2.8 90mm Wall 2.8
	still Airgap: none ▼ R-value: 0.00
Wall Lining : generic - gypsum Plasterboard 10mm ▼ R-value: 0.04	
internal surface 0.09	

Name:

Garage wall

heated ☐2.27
m²°C/W

Type: Wall: Timber Frame (direct fixed Cladding)

external surface 0.03	
Cladding : generic - Gypsum plasterboard 10mm into still air (garage, etc.) ▼	
R-value: 0.10	
Air Barrier : generic - none ▼	
R-value: 0.00	
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm ▼	
Wall Frame Area: 14.4% Framing : R-value: 0.75	Cavity Area: 85.6% Insulation : 2.8 still Airgap: none ▼ R-value: 0.00
Wall Lining : generic - gypsum Plasterboard 10mm ▼	
R-value: 0.04	
internal surface 0.09	

Roof Construction Details

Name:

Rooftype 1

Ceiling Perimeter ☒heated ☐4.23
m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

external surface 0.03	
Roofing : generic - Metal corrugate Iron with building paper ▼	
R-value: 0.01	
Insulation : ▼	
Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation ▼	
Roof Frame Area: 5.0% Roof space (still air) 0.11 Framing : R-value: 0.75	Cavity Area: 95.0% Roof space (still air) 0.11 Pink(c)Batts(c) Ultra R4.0 Ceiling 4 notched to cover bottom chord ☒
Roof Lining : generic - gypsum Plasterboard 13mm ▼	
R-value: 0.06	
internal surface 0.09	
Non-IC-rated recessed downlights	
Ceiling Area [m ²]: 148.64 Number of downlights: Clearance from lamp holder side [m]:	

Glazing Details

Name:

Windows

Opaque Door ☐0.50 m²°C/W

Type: Thermally Broken Aluminium Frame

Glass Type : Double Pane: Low E4/Clear - Argon - Thermally improved Spacer (Ug 1.10) ▼
R-value: 0.50
Solar Heat Gain Coefficient (SHGC): 0.84

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: 7 Whitenhaven Street

Suburb:

Town/City: Oamaru

Postcode:

THE OWNER

Name(s): Burgess & Allen

Mailing address: 3 Whiterocks Road, Weston

Suburb:

PO Box/Private Bag:

Town/City:

Postcode:

Phone number: 027 6933483

Email address: shannonmburgess@outlook.com

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (✓)

()	sole designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design myself – no other person will be providing any additional memoranda for the project
(✓)	lead designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
()	lead designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memoranda relating to their specific RBW design
()	specialist designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I Uros Plajh ~~carried out~~ / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
<i>Tick (✓) if included Cross (X) if excluded</i>	<i>[If appropriate, provide details of the restricted building work]</i>	<i>[Specify whether you carried out this design work or supervised someone else carrying out this design work]</i>	<i>[If appropriate, specify references]</i>

Primary structure

All RBW Design work relating to B1	(✓)	-	() Carried out (✓) Supervised	-
Foundations and subfloor framing	(✓)	Concrete Foundation to NZS3604:2011,	() Carried out (✓) Supervised	Sht 7, 13 & 14 (foundation + Cross Sections)
Walls	(✓)	Timber Frame to NZS3604:2011	() Carried out (✓) Supervised	Sht 13 & 14 (Cross Sections)
Roof	(✓)	Timber Trusses by Placemakers	() Carried out (✓) Supervised	Sht 13 -15 (Cross Sections + Roof Plan) + Prenail Truss Design
Columns and beams	(✓)	Timber Lintels by Placemakers, Timber Lintels to NZS3604:2011	() Carried out (✓) Supervised	Sht 15 (Roof Plan)
Bracing	(✓)	Bracing to NZS3604:2011, GIB Ezybrace system, CHH ECOPLY bracing	() Carried out (✓) Supervised	Sht 17 (Bracing Plan) + Bracing calculations
Other	(X)		() Carried out () Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(√)	-	() Carried out (√) Supervised	-
Damp proofing	(√)	<i>0.25 polythene on sand blinding</i>	() Carried out (√) Supervised	Sht 7, 13 & 14 (foundation + Cross Sections)
Roof cladding or roof cladding system	(√)	<i>Profiled Longrun metal roofing, trapezoidal,</i>	() Carried out (√) Supervised	Sht 10-14 (elevations + Cross Sections)
Ventilation system (for example, subfloor or cavity)	(√)	<i>Drained & Vented cavity to NZBC E2/AS1</i>	() Carried out (√) Supervised	Sht 13 & 14 (Cross Sections)
Wall cladding or wall cladding system	(√)	<i>JH Linea w/board, JH Vertical Oblique</i>	() Carried out (√) Supervised	Sht 10-14 (elevations + Cross Sections)
Waterproofing	(√)	<i>Vinyl to wet areas,</i>	() Carried out (√) Supervised	
Other	(X)		() Carried out () Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other	(X)	<i>Residential Smoke alarms to NZBC C/AS1 (not RBW)</i>	() Carried out () Supervised	
--	-----	---	-----------------------------------	--

Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required () Yes (√) No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
<i>[List relevant clause numbers of building code]</i>	<i>[Specify nature of waiver or modification of building code]</i>

Note: continue on another page if necessary.

ISSUED BY

Name: Uros Plajh		LBP or Registration number: BP132726	
The practitioner is a: (√) Design LBP () Registered architect () Chartered professional engineer			
Design Entity or Company (optional):			
Mailing address (if different from below): PO BOX 4516, MOUNT MAUNGANUI SOUTH 3149			
Street address / Registered office:			
Suburb:		Town/City:	
PO Box/Private Bag:		Postcode:	
Phone number: 07 578 7345		Mobile:	
After Hours:		Fax:	
Email address: uros@spacelab.nz		Website:	

DECLARATION

I **Uros Plajh** , LBP,

state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code

Signature:	
Date: 20 June 2024	