BCN/2020/10038
Approved Building Consent Document
28/10/2020 Cate McPherson

LYN BUNN

LOT 460 HOFFMAN ST

CHRISTCHURCH

PRELIMINARY AND GENERAL

BUILDING CONTRACT:

The general conditions governing the contract shall be generally as set out by the Canterbury Masters Association and shall be prepared by the Contractor.

SPECIFICATION:

This specification shall be read in conjunction with the drawings and the contract and shall be taken to be a record of the materials used and the standard of workmanship expected from the Contractor and Sub-contractors.

Anything not specifically mentioned will be carried out to the New Zealand Standard Specification 3604 and New Zealand Building Code and NZS 4229 Concrete Masonry Buildings nor requiring specific design.

FOREMAN:

The Contractor is to have a competent foreman in charge of the contract from start to completion of work.

EXAMINE THE SITE:

The Contractor is advised to familiarise himself/herself with the site, specifications and drawings and to obtain generally their own information on all matters affection the execution of the works before submitting their quote.

The submission of a quote will be taken to mean that this has been done and that any matter that might affect the works has been taken into consideration and that allowance has been made accordingly. Any uncertainties shall be brought to the attention of the client.

BY-LAWS AND REGULATIONS:

All work and materials shall be in accordance with the requirements of the Building Regulations and with the New Zealand Building Code Handbook and approved documents and NZS 3604 Code of Practice for light timber frame buildings not requiring specific design. The contractor and subcontractors undertaking with work shall obtain copies of the relevant sections of the New Zealand Building Code and documents relating to acceptable solutions and verification methods and shall be conversant with their contents as these documents become part of each section of this specification.

Provision shall be made within the quotation of tender to comply with the by-laws and regulations of any authority, which relates to the works and to obtain all necessary permits to complete the work. The acquisition of the building Consent shall be the responsibility of the Client.

INSURANCE:

Before commencement of work the Contractor shall supply the Client with cover notes from the insurance company certifying that all the insurances required are covered by valid policies. The Contractor will be required to effect and maintain over the duration of this contract an insurance against loss or damage by fire to property, loss of life, accident, injury or damage to property arising out of, or caused or contributed to either directly or indirectly by the operation of the Contractor.

WORKMANSHIP:

All workmanship shall be in accordance with good trade practices and such that a good standard of end result will be obtained.

PROTECTION OF EXISTING BUILDINGS, PATHS, ETC:

Protect existing buildings, paths, driveways, services and roadways from damage due to contractual operations. Properly make good or repair any damage that may occur.

VARIATIONS:

No variations to the contract shall be made without the prior written permission of the client.

TEMPORARY POWER SUPPLY:

The Contractor will be responsible for arranging "Contractors Power Supply" connection on site and arranging all necessary fees to be paid.

PROVIDE PLANT:

Provide all plant, scaffolding, hoists, tackle etc and a foreman plus sufficient number of men for the proper expeditions and the complete execution of the works, supply and cartage, workmanship and materials, which although not specifically mentions, may be nevertheless incidentally necessary for the proper completion of the work described herein.

SETTING OUT:

The Contractor is to do the setting out of all work and is to be responsible for its accuracy and must amend any errors. Check all dimensions on the site in particular siting and set out of foundations before pouring any concrete. Any doubt in setting out shall be reported to the Designer.

ATTENDANCE:

Contractor shall ascertain from each sub-contractor all particulars relating to his work with regard to the order of its execution and the position in which chases, holes etc shall be required before the work is started. No claim shall be allowed for extra cost of cutting away work already executed in consequence of any neglect by the Contractor to ascertain these particulars before hand.

CLEANING AND PROTECTION:

The Contractor shall at frequent intervals and in any case whenever so required by the owner and at completion, remove from the building and site all rubbish litter and surplus materials which may accumulate and shall take all reasonable precaution to protect finished surfaces from damage or disfigurement of the finished work of other trades and will be responsible for the cost of restoring any surfaces harmfully affected. Particular care shall be taken by all trades to avoid scratching, denting or bruising finished or exposed joinery timbers. All paint or plaster splashes or other marks shall be removed and cleaned off immediately.

PURCHASE OF SPECIAL GOODS:

The Owner reserves the right to purchase all fittings etc for which P.C. prices or Lump Sums are specified. The P.C. Sums quoted shall be P.C prices in Christchurch and the Contractor shall be entitled only to the usual trade discount. Where Lump Sums are specified the amounts allowed are net and the Contractor must add his own profit to such sums specified as no discount will be allowed.

SHEDS AND STORAGE:

The Contractor shall supply ass necessary temporary sheds and toilet for the use of his men and for storage of materials on the site.

CARE OF WORKS:

The Contractor is to keep all persons on the works (including those employed by sub-contractors) under his control and within the boundaries of the works generally until their completion including all work executed and materials deposited on the site by himself or sub-contractors and suppliers. The Contractor shall be responsible for all damage arising from weather carelessness of the operatives, damage or loss and shall be held solely responsible for all damage to adjoining buildings or property caused by him or his employees including sub-contractors and shall indemnify the principal against all claims on account thereof.

PROTECTION FROM WEATHER:

The Contractor is to cover up and protect the works from the weather and is to suspend all operations during weather, which would be detrimental to the work.

COMPLETION:

At completion the Contractor shall remove all refuse and debris from and around the building and off the site. Leave the whole site tidy and fit for gardening and leave the entire buildings, including paths, steps, terraces etc ready for use. All floors shall be left broom clean, all glass work left sound and clean inside and out and all painted and stained or polished work left free from spots and dirt. All bench tops and basin, pans, etc shall be left clean and free from paint, varnish or other spots.

MAINTENANCE:

The Contractor shall make good all defects, shrinkage or other faults whatsoever which may arise or appear within a period of ninety (90) days after the certified completion of the works. Maintenance retention shall be 2.5% if the contract price and shall be retained until the completion of the 90 day maintenance period.

CERTIFICATES:

The Contractor shall obtain from the Territorial Authority, Network Utility Authority or Building Certifier all required certificates and approvals.

Where Producer Statements are required by the Territorial Authority prior to the issue of a Code Compliance Certificate, the Contractor shall obtain and deliver such required statements.

The Contractor shall uplift a Code Compliance Certificate (covering the whole of the building work) from the Territorial Authority or the Building Certifier as applicable prior to completion of the contract.

FOUNDATIONS/EXCAVATIONS

SETTING OUT:

The Contractor/Sub-Contractor shall be responsible for the accurate setting out of all construction work and services required to be executed under this contract.

EXCAVATIONS:

The Contractor/Sub-Contractor shall organise the removal of all vegetation etc until firm ground, free from organic matter, is reached. The actual ground level shall be measured and agreed to between the Contractor/Sub-Contractor and the Engineer prior to any work being carried out. Excavate for driveway and retaining walls. All excavations shall be maintained where necessary by planking and strutting to prevent the sides of trenches collapsing. In all excavations the Contractor/Sub-Contractor shall ensure that all trenches are kept free of water. If water intake should occur pumping or other means shall be taken to completely remove the water.

BACKFILLING:

All backfilling shall be placed and compacted in layers of 150mm max thickness and compacted by suitable powered mechanical compaction equipment and the ground excavated beyond the building line shall be backfilled to marry into the existing ground level.

SERVICES:

Allow for the excavation of all required service lines inside or under the building that are required to be buried in or under concrete or timber floors in collaboration with the various trades, before the construction and placing of any concrete, hard fill or timber floors.

FOUNDATIONS:

Foundations to be constructed as detailed on the drawings. Provide openings, chases, pockets etc in foundations for electric cables, telephone cables, water supply, waste pipes and sewer as required.

CONCRETOR

MATERIALS AND WORKMANSHIP

Concrete shall be manufactured and placed in accordance with the requirements of NZS 3604.

CONCRETE

Concrete shall be thoroughly and continuously compacted during placement by internal vibration so as to produce a dense uniform mass with the surface finish specified. Immersion or poker type vibrations shall be of suitable diameters and of sufficient number to ensure that at the required rate of placement of each part of the structure the entire volume of each layer of concrete is thoroughly vibrated and complete compaction is achieved. The minimum strength of concrete is as follows:

1. Foundations 20 Mpa
2. Floor Slabs 20 Mpa
3. Block work Grout 20 Mpa

BUILT-IN ITEMS:

Provide and build in to the concrete work all necessary anchors, holding down bolts, ties plugs etc for securing of other work to the concrete. Provide and build in all sleeves, pipes, wires, conduits and other requirements necessary for the provision of services to the building.

REINFORCING STEEL

MATERIALS AND WORKMANSHIP:

All reinforcing steel shall be Ductility Grade E steel. The bending, cleaning, placing and lapping of reinforcing steel shall be carried out in accordance with the appropriate standards, the best trade practises and as indicated on the drawings.

All Reinforcing steel to NZS 4671

PLACING AND COVER:

All reinforcing steel shall be placed and securely fixed in accordance with the drawings. Reinforcement shall be accurately supported by concrete or other approved chairs, spaces or ties. The use of bricks, stones or timber for the support of reinforcing steel is strictly forbidden.

CARPENTER

GENERAL:

All carpentry work is to be set out to the dimensions given and attend upon all other trades. All work shall comply with the N.Z.B.C and acceptable solutions and N.Z.S 3604

TIMBER:

All timber is to be the best of its respective kind, free from loose knots, shakes and other imperfections and to hold to the sizes specified.

KINDS OF TIMBER:

Timber shall be graded according to the NZS 3631 : "Classification and Grade of Timber." Framing timber shall be dry to 20% moisture content before being enclosed and finishing timber to 12%-18% moisture content. Structural timber shall be standard engineering grade.

FINISH:

Framing timbers shall be gauged. Timber exposed to view or touch, shall be machine dressed. Interior finishing's shall be with sandpaper. Remove all arises, rough or uneven patches, hammer marks and other surface defects before painting or other surface finishing.

WORKMANSHIP AND CONTRUCTION:

Workmanship and construction shall be of the best trade practice, and shall comply with the relevant provisions of N.Z.B.C and NZS 3604. The best trade practice shall be deemed to include those methods, practises and processes contained in the current syllabuses for the New Zealand Trade Certificates in Carpentry, Joinery and Timber machinery.

BUILDING PAPER:

Building paper shall be as noted on drawings. Torn or punctured sheets shall be rejected and must be replaced. Adjacent sheets shall have a minimum lap of 100mm. B2 durability. N.Z.B.C.

DAMPCOURSE:

A damp course of 3 ply bitumen fabric weighing not less than 3.66kg per sq metre shall be laid under all timbers in contact with concrete.

WALL FRAMING:

Framing is generally laserframe.

1. Plates – All plates shall be in long lengths laid flat and shall have dovetail halvings at all connecting points, corners and junctions.

2. Studs - All studs shall be cut to lengths as required, having square ends and shall be spaced to suit wall linings centres as shown on drawings. At all corners and junctions, sufficient studs shall be provided to give a 50mm bearing to a linings.

3. Dwangs - Dwangs shall be 90x45mm timber in rows spaced at a maximum of 800mm apart and securely nailed to studs with two nails at each end. Provide all extra dwangs required to support fittings and at all joints of lining sheets.

ROOF CONSTRUCTION:

a) **Trussed Roofs:** Drawings showing clearly the type, pitch, span, spacing and overhangs of roof trusses and details of roof claddings shall be provided to the truss manufacturer. Thereafter, the Contractor shall match construction with the drawings and details provided by the truss manufacturer throughout all stages of fixing and bracing. The Contractor shall especially accord with the manufacturer's instructions for tying down where over-hangs exceed 750mm. In all cases anchorage of all trusses to plates shall be with not less than 2/100mm skew nails plus 2/4.0mm wire dogs.

EAVES:

Construct boxed eaves (unless otherwise shown on plans) and fit timber fascia or leave ready for fixing of Stratco spouting and fascia or Taylor Fascia. Line underside of soffits (unless otherwise detailed) with 4mm flat hardieflex sheets.

METER RECESS:

Provide recess for Electric meter Board where directed to the satisfaction of the Local Electric Supply Authority.

MAN HOLE:

Provide manhole in ceiling 800 x 800mm where directed.

WARDROBES:

To be lined full height. Provide inside each with 300 x 25mm full width shelf at 1.7m from floor and 20mm galvanised pipe coat rail at 75mm below shelf. Provide cupboards over wardrobe where required.

LINEN:

Lined full height inside and to have 25mm helving. Full depth for linen at approximately 400mm c.c.

ARCHITRAVES, SKIRTINGS ETC:

Finish all windows internally, door openings and wherever required with 50 x 12mm rounded or splayed architraves. Finish at junction of floor and well with 75 x 12mm Rimu or Custom wood skirting neatly mitred at angels and scribed to floor. Supply and fix beads, half rounds where required.

INSTALLATION:

Install bath tub, shower cabinet/s, w.c., hand basin, vanity units and all other joinery as supplied by joiner.

SHOWERS:

Construct shower cabinet as shown on Plan, if not a one-piece unit. Fit shower floor (floors) and line walls with an approved wet area wall lining. Owner to choose colour.

SHOWER DOORS:

Supply and install sliding shower doors and screens where required, with clear safety glass.

GARAGE DOORS:

Supply and install Tilta or Roller door as shown on plan.

PRIMING TIMBERS:

Allow to Prime or Stain any exterior timbers where necessary before erection.

INSULATION:

Refer to NZBC Clause H.1 Install insulation as required in NZBC acceptable solution H1/ASI. All insulation materials are to be installed in accordance with manufacturers recommendations and the NZBC.

R3.6 – fibreglass batts to ceilings
R2.6 – fibreglass batts to exterior walls

BRICKLAYER

GENERAL:

All work is to be carried out by specialist tradesmen and in accordance with the requirements laid down in NZSS 3604 and NZS 4229 as appropriate and NZS 4210.

WORKMANSHIP:

Walls shall be erected true to line and plumb and be properly bonded and bedded in mortar.

Blocks and bricks shall be free from cracks and chips. Any concrete or mortar slit on walls shall be washed off before it can set. Any mortar slit on Aluminium doors or window frames is to be washed off immediately before it dries.

BOND:

Blocks shall be laid in stretcher or stack bond as shown. All joints shall be full and struck to provide a fair faced finish to both surfaces complete bond shall be secured between the blocks and mortar. Ensure that bond is not broken by making adjustments to blocks after mortar has taken a set.

MORTAR:

The mortar for all block work shall be composed and mixed according to the relevant NZS clauses; water shall be potable; sand shall comply to NZS 3109 for grout filing of masonry cavities and NZS 3103 “Sands for Mortar”, Plaster and External Renderings” for mortars. All mortar mixes shall have a minimum compressive strength of 12 Mpa at 28 days.

All cement shall comply with NZSS 3122 and shall be properly stored at the site and adequately protected from dampness.

JOINTS TO BLOCKWORK:

All block work joints shall be neatly tooled with a 10mm jointer to form a neat concave recess to a good line, level and of consistent depth of approximately 6mm.

WATERPROOFING:

The Contractor shall ensure all block work above and below ground prevents the entry of water into the inside of the building. The Contractor shall provide warranties and prices for waterproofing from a number of manufacturers of their approved applicators and the type and price for the work shall be agreed. Internal strapping and lining as necessary to comply with insulation stands shall not proceed until evidence that the block work is free from leakage is demonstrated.

WEEP HOLES:

Provide weep holes in concrete block work at least 50mm below all bottom plates and below finished ground level and above intermediate floor level, at approximately 800mm intervals. Dill or rake out weep holes to base of mortar bedding so as not to entrap any rain that might enter the walls.

MATERIALS:

Type of Brick:

a) Bricks for external veneers and foundation walls shall be of the colour and type selected and shall comply with Midland Brick specification. All fair face brickwork shall be laid with their best face outwards.

b) Cement shall be ordinary Portland cement and at the time of use shall comply with NZSS 3122 Portland Cement.

c) Plasticizers shall be used in accordance with the manufacturers instructions and no other additives are to be used in conjunction with these materials. On no account will further addition be made at the time of retempering mortars.

d) Water – water shall be portable.

e) Sand for Mortars – Sand used shall be Mercer No 1 sand and/or shall comply with the relevant clauses of NZSS 3103, Sand or Mortar, Plasters and External Renderings.

PREPARATION OF MORTAR:

Mortar shall be prepared by mixing in an approved mixer. Measurement of materials shall be by volume using suitable containers. Mortar shall be mixed until a homogenous mass is obtained but for not less than 5 minutes. All mortar whether on the boards or left in the mixer shall be used within 90 minutes. Mortar not used in this time shall be discarded.

BRICKLAYING:

Bricks shall be laid in stretcher bond true to line and level and plumb and in accordance with the best trade practice. All work shall be laid from the lowest corner and no corner shall be raised more than 900mm above wall line. Corners shall be racked back. On no account shall toothing be permitted. All joints will be completely filled with mortar and the bricks shall be disturbed as little as possible after initial positioning. Joints shall, unless otherwise specified, be not more than 9.5mm thick and shall be tooled as directed as work proceeds. Where tapestry bricks are used care shall be taken to use a tool slightly smaller than joint width to prevent pushing mortar into the brick striations.

MASONRY VENEER:

a) Building Paper:

Run Buiding Wrap horizontally and well secure to outside face of framing from bearer to top plate. Repair tears and holes before constructing Veneer.

b) Clay Brick Veneer:

I. Construct brick veneer with approved face fixed ties at correct spacings in accordance with E2/AS1 and with materials and workmanship to NZS 4210

II. A cavity of not less than 40mm and not more than 75mm shall be maintained between building paper and veneer. Where necessary weep holes shall be left every third joint for the discharge of water, as under Concrete Block layer. Keep the cavity and up stand clean, free from mortar protrusions and droppings. Keep pipes or electrical wire, junction boxes etc, out of the cavity. Thoroughly clean down the face of work on completion leave free of mortar stains and efflorescence.

c) Sills:

Sills to be brick on edge brought to underside of wooden sills or aluminium joinery. Junction between to be filled with a suitable sealant as recommended by the Joinery Manufacturer and over pointed with cement mortar.

ALUMINIUM JOINERY

GENERAL:

All window and door frames shall be built from selected powder coated aluminium sections/profiles. All aluminium to comply with NZS 4211 "Specification for Performance of Window" and NZS 3504 "Specifications for Aluminium Windows" and NZS4223 Parts 3: 2016 and to be to sizes shown on plans.

Windows to be fitted with H3.1 25mm Pine Reveals grooved to take Gibraltor Board and lockable double tongued latches to sashes. The colour of the aluminium frames shall be selected by Owner.

All glass shall comply with N.Z.S.4667 & 4223 Parts 3: 2016

Double glaze units as shown.

All windows & doors to be fitted with WANZ bars as per drawings & manufactures specifications

TIMBER JOINERY

GENERAL:

Refer to General Conditions of Contract, which shall apply to this section of work.

Supply all joinery as required and shown on the plans, including trim, pelmets, stairs etc.

All materials and fittings must be top quality and shall be supplied to the site pre-finished or ready for finishing as indicated.

The Joiner must discuss the joinery details with the main Contractor/Owner at the time of pricing to clarify any queries he may have and prior to manufacture if necessary.

The Joiner must site measure and verify all opening heights, for fitted joinery and confirm final appliances sizes and models, and tolerances required for all built-in fittings. Joiner shall liaise with the Main Contractor and Carpenter to allow all necessary tolerances, shadow margins etc to allow building in.

KITCHEN JOINERY:

Kitchen joinery to be built up as shown, for the supply of kitchen joinery including all bench tops, etc.

Joiner to liaise with Main Contractor/Owner to discuss final details before manufacture.

INTERIOR DOORS:

All interior doors to be 810mm paint grade/Rimu in ex 150 x 35mm Rimu DA back grooved for Gibraltor Board.

All other cupboard doors and front to be as shown on plan.

Aluminium wardrobe panels fitted into 150 x 35mm Rimu DA Reveals grooved for Gibraltor Board.

EXTERIOR DOOR:

Supply of main entry door to be hung in aluminium frame with sidelights or heart rimu timber frame with sidelights as shown on plan.

INTERIOR LININGS

WALLS:

Line all walls with 10.0 mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

OTHER LININGS:

CEILINGS:

Line ceilings with 13.0mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

GIB COVE:

PLASTER CORNICES:

ROOFER

TYPE OF ROOF:

Corrugated roofing at 25”

GENERAL:

The roofer shall co-operate with and co-ordinate their work with that of the Plumber in the provision of gutters brackets, flashing, downpipes, etc. All roofing and flashing shall be laid by tradesmen wearing soft footwear and experienced in this type of work. On completion of this part of the contract, all surplus materials, debris and rubbish shall be removed from the site and the roof shall be left in a thoroughly watertight and weatherproof condition.

Workmanship: All roofing materials shall be laid in strict accordance with the manufacture instructions and to NZS3604 & NZ Metal Roofing Manufactures Inc: NZ metal roofing & cladding code of practice

Guarantees: The Roofer is to provide all standard guarantees for the materials and workmanship as offered by the manufactures/suppliers of the roofing.

PLUMBER

ACCORDANCE WITH BY-LAWS:

All plumbing work to be in accordance with the Building Act, the Building Act and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the H.Z.B.C. Chapters B2, G10, G12, G13 and E1. All pipe materials are to be to AS/NZS 1260

CONSENTS AND FEES:

Arranged for and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials.

MATERIALS:

All materials to be of the best of their respective kinds and to approval before being used.

DOWNPIPES:

Where shown supply and fix DP as per plans. Downpipes secured with standoff brackets – 2 per downpipe. All downpipes shall be plumb and straight without offsets into spigots/sumps.

SPOUTING AND FASCIA:

Provide and fix type of spouting and metal fascia as shown on plans. All materials shall be laid in strict accordance with the manufacturers instructions. Colour to be selected.

FLASHINGS:

Liaise with the Carpenter to supply all flashings as required for the complete weatherproofing of the building and appurtenances. All flashings shall be shop formed and to approval.

ROOF FLASHINGS:

Flash all roof penetrations as necessary. Liaise with roofing contractors.

COLD WATER SUPPLY:

Bring in 20mm diameter cold water supply from lateral to house, provide meter and stopcock control/toby box as required by local Authorities. Provide taps at a suitable position to allow the complete system to be drained and shut down due to frost if not being used.

Pipe work shall be Polybutylene or similar to the approval of the Owners and shall be smooth full bore, seamless free from defects and suitable for the plumbing system. All pipe work shall be lagged to suit conditions.

HOT WATER SUPPLY:

Install Hot Water as shown on plans

All hot water piping shall be copper, generally 15mm diam. (20mm to bath_ shall be carefully formed with a smooth internal bore and shall be lagged and strapped tightly to the framing.

The hot and cold water supply lines to all fittings shall be taken off to give the best uninterrupted flows and pressures to fittings, e.g. showers first, then bath, basins, sinks, etc.

TRAPS AND WASTES:

Provide pvc wastes, pipes and raps to all fittings as required by regulation. Conceal all vents within wall space. Refer also to drawings. Wastes cast under slab shall be wrapped in "Denso" tape and plumbers felt.

All first floor back vents from fittings are to combine in ceiling space and connect in to soil stack vent before passing through roof.

TAPS, ETC:

Taps, mixers, shower rose, etc shall be covered by a P.C sum of $……..

SANITARY FITTINGS:

1. W.C Pans – Caroma Concorde Sovereign 2000 pans and cisterns. Colours to be selected.
2. Shower Trays – supply shower trays to sizes shown on plan. Colour to be selected.
3. Bath – supply bath/spa bath as shown on plan. Colours to be selected.
4. W.C. Hand basin – Caroma Valet Hand Rinse Basin. Colour to be selected.
5. Vanities: Allow for the supplying of vanity units.
6. Tub – Rotec Super Tub, complete with taps.

HOSE TAPS:

Supply and install two hose taps.

ADDITIONAL PLUMBING FOR FOLLOWING APPLIANCES AND INSTALLATION AS SUPPLIED BY OWNERS:

1. Dishwasher

ELECTRICIAN

GENERAL:

The electrical work shall be carried out in accordance with the NZECP 51, the Building Act, The New Zealand Building Code and Approved Documents, and to the complete satisfaction of their Inspector. All wiring shall be concealed.

CONNECTION TO MAINS:

Make all necessary connections to the Local Authority main, all wiring shall be underground within the site boundary.

Allow to provide temporary power to site for construction.

CONSENTS:

The Electrician shall obtain all Consents and pay all fees for the above work before commencing any work.

MATERIALS AND ARTICLES:

Except where specified otherwise, all materials and articles shall be of New Zealand Manufacture. All articles and materials not specified by makers catalogue number, shall be of the best quality.

WORKMANSHIP:

The whole of the work shall be carried out by skilled Tradesmen using adequate equipment and methods in accordance with best Trade practice.

FINISH:

Particular care shall be taken with this section of the work, as none but a high class finish shall be accepted.

SETTING OUT:

Where not specifically shown on the drawings or noted in the specification, the exact position of points and lights shall be determined on the job by the owner.

POINTS:

Allow for double outlets and single outlets as shown on plan

LIGHTS:

Allow for light points as shown on drawings. If light fittings are to be supplied allow a P.C. sum of $ ……. For the supply of fittings. If fittings supplied by owners, owners shall liaise with Main Contractor/Electrician for installation of fittings.

SHAVING POINTS:

Allow for shaving points to all vanities.

TELECOM, TELEVISION AND SECURITY WIRING:

Refer to Electrical plan.

BATHROOM HEATERS AND TOWEL RAILS:

Allow for and install heated towel rail to Bathroom and ensuite.

ADDITIONAL WIRING AND INSTALLATION OF FOLLOWING APPLIANCES AS SUPPLIED BY OWNERS:

1. Range hood as shown on plan
2. Dishwasher as shown on plan
3. Front Door Bell
4. Garage Door Opener (supplied with garage door)

DRAINLAYER

GENERAL:

All work shall comply with the Building Code, the Building Act, and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the N.Z.B.C. Chapters B2, G10, G12, G13 and E1.

The general Contractor is to collaborate with the Drainage Contractor and arrange with him for carrying out his work at such times and in such a manner as will cause the minimum amount of inconvenience and delay.

All stormwater and sewer pipes where possible are to be run in the same trench.

CONSENTS AND FEES:

The drain layer shall apply and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials. On completion, the whole of the drainage is to be tested and handed over to thorough working order, according to the requirements of the Local By-Laws and to the satisfaction of their Inspector. The Drain layer shall supply any necessary records of works carried out as required by the New Zealand Building Code.

CO-OPERATE WITH CONCRETOR/CARPENTER:

Co-operate with the Concretor for the forming of opening of foundations, pads, etc. Co-operate with Concretor in placing all necessary pipe work before concrete is placed.

PIPES:

All sewer and stormwater pipes shall be uPVC complying with NZS 7643

GULLY TRAPS:

All gully traps shall be uPVC with cast aluminium grates. Set gully trap in concrete haunched around pipe.

Surround gully dish with concrete 100mm above finished ground level properly boxed with a plaster finish.

LAYING OF DRAINS:

All drains shall be commenced at the point of outfall and worked back to the highest part with at least 500mm earth cover.

All branches and other connections, cleaning eyes etc to be connected in as work proceeds. All joints shall be made as per Manufactures instructions.

If cover is less than 500mm pipes shall be covered with concrete to the requirements of the Local Authority. Soil and stormwater pipes under slab shall be run in ABS pvx.

SEWER MAIN:

Excavate and lay drain to connect into existing sewer Lateral as indicated on drawings to the approval of the Local Authorities.

STORMWATER MAIN:

Excavate and lay stormwater disposal system to discharge into side channel as indicated on drawings to the approval of the Local Authorities.

DOWNPIPE SUMPS:

Form downpipe sumps using 100mm dia. uPvc riser set into concrete surround haunched around pipe.

Surround riser with concrete properly boxed 100mm above finished ground level with a plaster finish and cast aluminium grate.

GAS

GENERAL:

All work shall comply with the Building Code, the Building Act, and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the N.Z.B.C. G10, G11, G12, and NZSD5601.1 Appendix J

The general Contractor is to collaborate with the Gas Contractor and arrange with him for carrying out his work at such times and in such a manner as will cause the minimum amount of inconvenience and delay

CONSENTS AND FEES:

Arranged for and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials.

MATERIALS:

All materials to be of the best of their respective kinds and to approval before being used.

WORKMANSHIP:

The whole of the work shall be carried out by skilled Tradesmen using adequate equipment and methods in accordance with best Trade practice.

FINISH:

Particular care shall be taken with this section of the work, as none but a high class finish shall be accepted.

SETTING OUT:

Where not specifically shown on the drawings or noted in the specification, the exact position of points and lights shall be determined on the job by the owner.

PLASTERER

GENERAL:

All work shall be carried out by suitably qualified and competent tradesmen who shall supply all materials, plant and equipment necessary to complete the works.

All work shall comply with the NZS 4251 “Code of Practice for Solid Plastering”.

SCOPE:

Allow to plaster area as shown on plan. Plaster finish to be discussed with Owners.

Allow to smooth plaster exposed surfaces of foundations.

PAINTING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC 1992:B2, E2, G7

Scope:

Soffits
Exterior cladding
Front door & sidelights
Interior walls & ceilings
Interior doors & window reveals
Skirtings & trims

Materials:

Dulux Tradeline in unopened containers.

External:

1 undercoat, 2 top coats acrylic high gloss or stain or oil as selected

Internal:

All Gibraltor board shall have sealer applied over No. 4 stopping finish, all in accordance with the Gib Board Manufacturer's specification.

1 coat Gib sealer or 1 undercoat, 2 top coats acrylic semi gloss or high gloss as selected.3 coats polyurethane for clear finish

GIB Aqualine to all wet area with 2 Coat Enamel

Colours:

All colours to be as selected and approved by Owner (maximum of 4 colours from white base)

Application:

Thoroughly prepare all surfaces, rub down between coats and leave a first class finish. Stop all cracks and nail holes, etc. No painting shall be done under adverse weather conditions. All paintwork shall be 3 coats in 1 undercoat and 2 top coats.

All work shall be of the highest standard, performed by skilled tradesmen in accordance with best trade practice, using tools and equipment suitable for ensuring a first class job.
No external work shall be done during frosty or inclement weather.
Any work damaged by dust, rain or any other cause shall be rubbed down and recoated. The top and bottom edges of all doors etc. shall be painted to the same number of coats as the exposed faces.

No coat of paint, varnish or polish shall be applied until the undercoat is perfectly dry and hard. All finished surfaces shall be left smooth, even and free from brush marks, lap marks, corner dribbles or other trades.

All fittings, fixings and hardware shall be removed before preparatory processes are commenced and shall be refixed on completion of the painting. Adequately protect all finished work, including glass from paint splashes.

On completion, clean down all surfaces involved, including glass, rubbish, splashes and blemishes, etc. Remove all rubbish and leave ready for occupation.

TILING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Scope:

This section of work includes supplying, laying, grouting and sealing of tiles to as shown on Floor Plan and in conjunction with Client

Laying:

Tiling shall be carried out following the guidelines and practices described in the BRANZ publication: Good Tiling Practice

Set out is to be confirmed at the time of selecting tiles and before work is commenced. Tiles shall be fixed straight and even with no ridges. Cracked or chipped tiles shall not be used. Where required tiles shall be cut using a saw to produce straight edges with no chips or cracks. Cut tiles shall be laid with cut edges concealed from view.

Joints to tiles shall be finished smooth and be sealed against moisture. Seal bottom edge of tiles at benches with selected colour-matched silicone type sealant. Sealant to be fungus resistant. Grouting of tiles to be sealed once dry to stop moisture penetration inwards.

Interior tiles shall be laid over Gib Aqualine

Guarantees:

The tiles shall provide a Guarantee to cover against defective workmanship and materials supplied by him for a period of not less than 2 years after Certified Practical Completion.

CERT OF TITLE or S & P

ADLS | REINZ

Tenth Edition 2019

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

This form is approved by the Real Estate Institute of New Zealand Incorporated and by Auckland District Law Society Incorporated.

DATE: Jul 10, 2020

VENDOR: CDL Land New Zealand Limited

PURCHASER: Lynley Claire BUNN **and/or nominee**

The vendor is registered under the GST Act in respect of the transaction evidenced by this agreement and/or will be so registered at settlement: **Yes/~~No~~**

PROPERTY

Address: Lot 460 Stage T6, U2, T7 and E1, Prestons Park Subdivision

Estate: **FREEHOLD** ~~**LEASEHOLD**~~ ~~**STRATUM IN FREEHOLD**~~ ~~**STRATUM IN LEASEHOLD**~~
~~**CROSSLEASE (FREEHOLD)**~~ ~~**CROSSLEASE (LEASEHOLD)**~~ (freehold if none is deleted)

Legal Description:

Area (more or less):	***Lot/Flat/Unit:***	***DP:***	***Record of Title (unique identifier):***
495sqm2	460		

As shown on the attached stage Subdivision Plan, subject to the Further Terms of Sale (a separate title for the Property is yet to issue).

PAYMENT OF PURCHASE PRICE

Purchase price: $ 253,000

Two Hundred & Fifty Three Thousand Dollars.

~~**Plus GST (if any) OR**~~ **Inclusive of GST** (if any)
If neither is deleted, the purchase price includes GST (if any).

GST date (refer clause 13.0): The settlement date

Deposit (refer clause 2.0): $ 5% of the purchase price inclusive of GST (if any) payable to Professionals Christchurch Limited upon the last of the Purchaser's conditions being satisfied.

Balance of purchase price to be paid or satisfied as follows:

(1) By payment in cleared funds on the settlement date which is 5 working days after the Vendor notifies the Purchaser that a search copy of the separate title for the Property is available or 30th September 2020 whichever is the later.

OR ~~(2) In the manner described in the Further Terms of Sale.~~

Interest rate for late settlement: 15 **% p.a.**

CONDITIONS (refer clause 9.0)

~~Finance required (subclause 9.1):~~	~~Yes/No~~	**OIA consent required (subclause 9.6):**	~~Yes~~/No
~~Finance date:~~		~~OIA date (subclause 9.8):~~	
~~LIM required (subclause 9.3):~~	~~Yes/No~~	~~Land Act consent required (subclause 9.7):~~	~~Yes/No~~
~~Building report required (subclause 9.4):~~	~~Yes/No~~	~~Land Act date (subclause 9.8):~~	
~~Toxicology report required (subclause 9.5):~~	~~Yes/No~~		

~~**TENANCIES**~~ ~~Yes/No~~

Name of Tenant(s):

~~Particulars of any tenancies are set out in Schedule 4 or another schedule attached to this agreement by the parties.~~

SALE BY: Professionals Christchurch Limited

Licensed Real Estate Agent under Real Estate Agents Act 2008

It is agreed that the vendor sells and the purchaser purchases the property, and the chattels included in Schedules 2 and 3, on the terms set out above and in the General Terms of Sale and any Further Terms of Sale.

JCA LB

FURTHER TERMS OF SALE

Refer to the Prestons Park Subdivision Further Terms of Sale for Stage T6, U2, T7 and E1, being Lots 398-406, 457-479, and 704-705 as attached.

JCA JCA LB LB

30. Solicitor's Approval Condition

30.1 This Agreement is conditional on the Purchaser's solicitor's approval of the form and content (including commercial matters) of this Agreement, within 10 (ten) working days after the date of this Agreement.

31. Geotech Report Condition

JCA JCA LB LB

31.1 This Agreement is conditional on the Purchaser's approval of a geotechnical report in relation to the Property, within 5 working days after the Vendor first makes the report available to the Purchaser, or 5 working days after the date of this Agreement, whichever is the later.

32.0 Finance

JCA JCA LB LB

32.1 This agreement is subject to and conditional upon the Purchaser(s) obtaining finance to enable the Purchaser(s) to complete the purchase of the property on terms and conditions satisfactory to the Purchaser(s) in all respects within 10 (ten) working days and by 4.00pm on the last day for confirmation.
This condition is inserted for the sole benefit of the Purchaser(s).

JCA JCA LB LB

33.0 Deposit

33.1 The person to whom the deposit is paid shall hold it as stakeholder until this agreement becomes unconditional or is earlier validy cancelled or avoided.

WARNING *(This warning does not form part of this agreement)*

This is a binding contract. Read the information set out on the back page before signing.

Acknowledgements

Where this agreement relates to the sale of a residential property and this agreement was provided to the parties by a real estate agent, or by a licensee on behalf of the agent, the parties acknowledge that they have been given the guide about the sale of residential property approved by the Real Estate Authority.

Where this agreement relates to the sale of a unit title property, the purchaser acknowledges that the purchaser has been provided with a pre-contract disclosure statement under section 146 of the Unit Titles Act.

Signature of Purchaser(s):

L C BUNN
L C BUNN (Jul 8, 2020 17:25 GMT+12)

Director / Trustee / Authorised Signatory / Agent / Attorney*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Director / Trustee / Authorised Signatory / Agent / Attorney*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Signature of Vendor(s):

Jason Craig Adams
Jason Craig Adams (Jul 10, 2020 16:34 GMT+12)

Director / ~~Trustee~~ / ~~Authorised Signatory~~ / ~~Agent~~ / ~~Attorney*~~
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Director / ~~Trustee~~ / ~~Authorised Signatory~~ / ~~Agent~~ / ~~Attorney*~~
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

*If this agreement is signed under:

(i) a Power of Attorney – please attach a **Certificate of non-revocation** (available from ADLS: 4098WFP or REINZ); or

(ii) an Enduring Power of Attorney – please attach a **Certificate of non-revocation and non-suspension of the enduring power of attorney** (available from ADLS: 4997WFP or REINZ); or

(iii) where the attorney signs for a trustee, a Certificate in the relevant form in Schedule 4 to the Trustee Act 1956.

Also insert the following wording for the Attorney's Signature above:
Signed for [full name of the donor] by his or her Attorney [attorney's signature].

BEFORE SIGNING THE AGREEMENT

- Note: the purchaser is entitled to a copy of any signed offer at the time it is made.
- It is recommended both parties seek professional advice before signing. This is especially so if:
  - there are any doubts. Once signed, this will be a binding contract with only restricted rights of termination.
  - the purchaser is not a New Zealand citizen. There are strict controls on the purchase of a property in New Zealand by persons who are not New Zealand citizens.
  - property such as a hotel or a farm is being sold. The agreement is designed primarily for the sale of residential and commercial property.
  - the property is vacant land in the process of being subdivided or there is a new unit title or cross lease to be issued. In these cases additional clauses may need to be inserted.
  - there is any doubt as to the position of the boundaries.
  - the purchaser wishes to check the weathertightness and soundness of construction of any dwellings or other buildings on the land.
- Both parties may need to have customer due diligence performed on them by their lawyer or conveyancer in accordance with the Anti-Money Laundering and Countering Financing of Terrorism Act 2009 which is best done prior to the signing of this agreement.
- The purchaser should investigate the status of the property under the Council's District Plan. The property and those around it are affected by zoning and other planning provisions regulating their use and future development.
- The purchaser should investigate whether necessary permits, consents and code compliance certificates have been obtained from the Council where building works have been carried out. This investigation can be assisted by obtaining a LIM from the Council.
- The purchaser should compare the title plans against the physical location of existing structures where the property is a unit title or cross lease. Structures or alterations to structures not shown on the plans may result in the title being defective.
- In the case of a unit title, before the purchaser enters into the agreement:
  - the vendor **must** provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act;
  - the purchaser should check the minutes of the past meetings of the body corporate, enquire whether there are any issues affecting the units and/or the common property, check the body corporate's long term maintenance plan and enquire whether the body corporate has imposed or proposed levies for a long term maintenance fund or any other fund for the maintenance of, or remedial or other work to, the common property.
- The vendor should ensure the warranties and undertakings in clauses 7.0 and 8.0:
  - are able to be complied with; and if not
  - the applicable warranty is deleted from the agreement and any appropriate disclosure is made to the purchaser.
- Both parties should ensure the lists of items in Schedules 2 and 3 are accurate.
- Both parties should seek professional advice regarding the GST treatment of the transaction. This depends upon the GST information supplied by the parties and could change before settlement if that information changes.

THE ABOVE NOTES ARE NOT PART OF THIS AGREEMENT AND ARE NOT A COMPLETE LIST OF MATTERS WHICH ARE IMPORTANT IN CONSIDERING THE LEGAL CONSEQUENCES OF THIS AGREEMENT.

PROFESSIONAL ADVICE SHOULD BE SOUGHT REGARDING THE EFFECT AND CONSEQUENCES OF ANY AGREEMENT ENTERED INTO BETWEEN THE PARTIES.

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

DATE: Jul 10, 2020

VENDOR:
CDL Land New Zealand Limited
Contact Details:
C/- Natasha Hood/Simone Cromhout
Level 13, 280 Queen Street, Auckland
PO Box 3248, Shortland Street, Auckland 1140
Natasha Hood Ph: 09 353 5019 Fax: 09 353 5098
Simone Cromhout Ph: 09 353 5074

VENDOR'S LAWYERS:
Firm:
Individual Acting:
Email:
Contact Details:
Please refer to the Vendor using the above contact details.

Email Address for Service of Notices:
(subclause 1.4)
admin@cdli.co.nz

PURCHASER:
Lynley Bunn

Contact Details:
[redacted]

PURCHASER'S LAWYERS:
Firm: Bishopdale Law
Individual Acting: Angela Dunbar
Email: angela@bishopdalelaw.co.nz
Contact Details: PO Box 20031
Bishopdale
Christchurch 8543
P: 03 359 6679
F: 03 359 4434

Email Address for Service of Notices:
(subclause 1.4)

LICENSED REAL ESTATE AGENT:
Agent's Name: Professionals Christchurch Limited
Manager: Colin Lock
Salesperson: Colin Lock
Contact Details:
33 Halswell Road, Hoon Hay, Christchurch 8025
P: 03 338 5924 | F: 03 338 1480 | service@prof.co.nz

JCA LB

TRUSS

Precut Construction Limited

PHONE: (03) 3237687
FAX: (03) 3238103
EMAIL: sales@precut.co.nz

Pre-Consent Sheet

Date:	**09/09/2020**	Job Ref#:	**PC20232**
Client:	**Lara van Drongelen**		
Job Address:	**Lot 460, Hoffman Street, Prestons Park**		
Building Consent Number:	**TBC**		
To Be Provided By:	**Christchurch District Council**		

We have been engaged to provide the Trusses and/or Framing for the above project.
To allow completion of the consent application we have supplied the following information:

(a) Consent Sheet
(b) Truss Layout
(c) Producer Statement
(d) Truss Fixings Report as per Mitek version 20/20 4.7
(e) Slab Thickenings for Point Loads - Not required
(f) Beam Design Layout as per Mitek SAPPHIRE version 8.3.1
(g) Beam Producer Statement as per Mitek SAPPHIRE version 8.3.1 & Spanman Beam Design Systems.

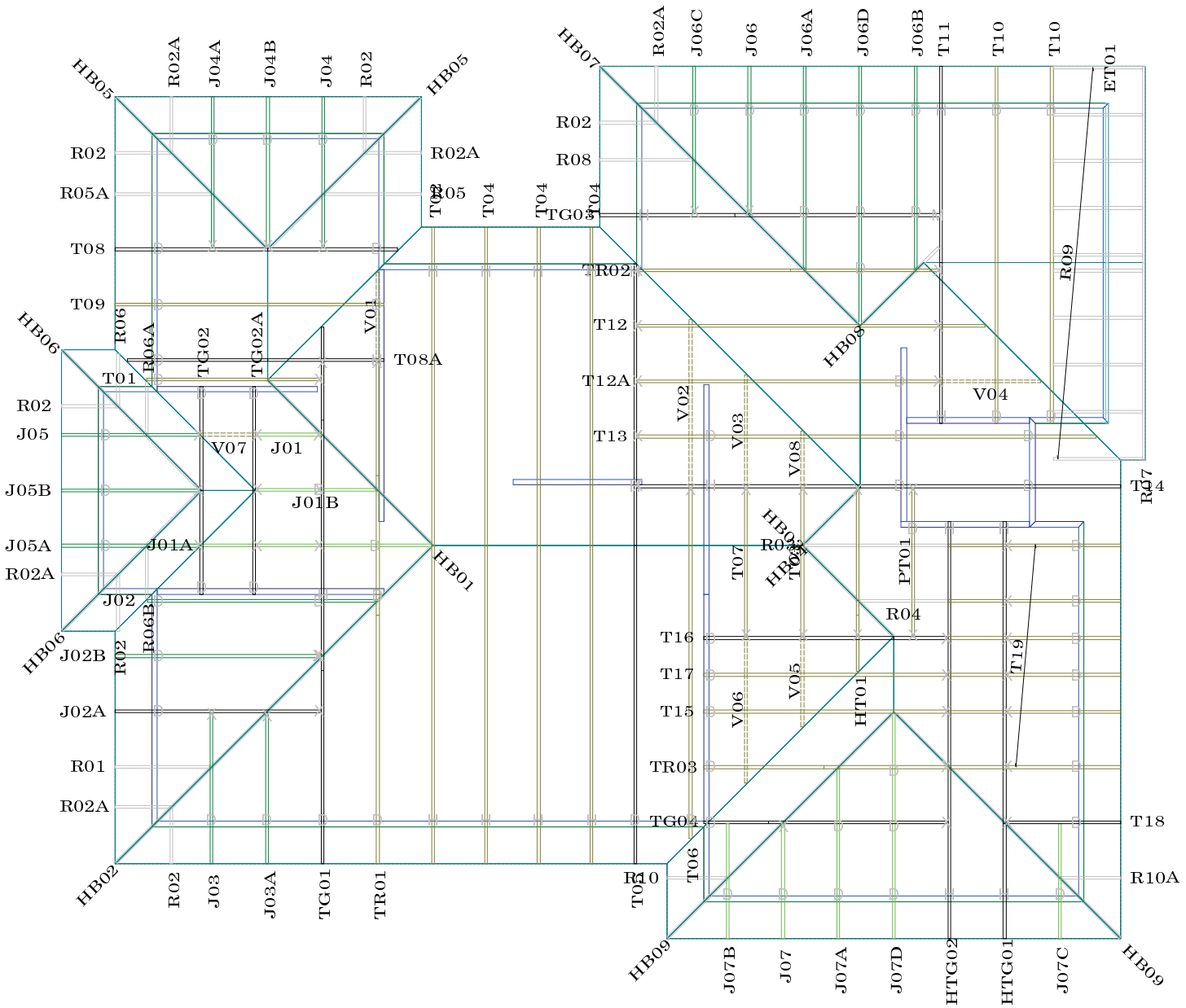
On advice from the building project owner, the structure will be designed under the following parameters:

Wind Zone:	**High @ 44.0m/s**	Snow Zone:	**0.9 kPa @ 100m**
Earthquake Zone:	**2**	Roof Materials:	**Longrun Iron**
External Framing :	**90*45 Sg8 H1.2**		
Internal Framing:	**90*45 Sg8 H1.2**		
Roof trusses:	**90*45 Sg8 H1.2**		

We can advise the following will be provided at the time of manufacture to both the building owner and your office.

1. A full ‘as built’ layout and producer statement .
2. Specific Truss Fixings as per Mitek version 20/20 4.7.
3. Specific stud to top plate fixings to comply with NZS3604:2011
4. Specific lintel fixings to comply NZS3604:2011
5. Beam Designs as per Mitek version 20/20 4.7
6. Producer Statement for any beams outside NZS3604:2011

Our company requires acknowledgement of this letter , along with the building consent number , as soon as possible.



Precut Construction

9 Empire Road Belfast Christchurch New Zealand Telephone: Fax:	Lara van Drongelen Hoffman Street Prestons Pard Christchurch	Job: PC20232	Building Consent No.:

Scale: 1 : 100 | Date: 31/08/2020 | Drawn By: Rebecca Mck

Job Details:

Snow Zone:	Christchurch (N4)	Snow Altitude:	100 m
Wind Area:	High	Design Wind Speed:	44.0 m/s
TC Restraints:	900 mm	BC Restraints:	600 mm
Roof Material:	Galv Iron 0.55mm	Ceiling Material:	Standard Plaster Board 13mm
Roof Live Load:	0.250 kPa	Snow Load:	0.441 kPa
Roof Pitch:	25.000 deg	Truss Centres:	900 mm

MiTek New Zealand Limited

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.miteknz.co.nz

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **Precut Construction**

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 **PC20232** 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.

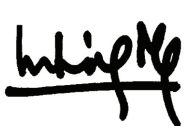
On behalf of MiTek New Zealand Limited, and subject to:

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: Wednesday, 9 September 2020**



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

Job: PC20232 Client: Lara van Drongelen Site:
Phone: Hoffman Street
Description: Prestons Pard
Building Consent No.: Christchurch Phone:
MiTek 20/20 Engineering 4.7.301.0 MiTek New Zealand Limited Printed: 13:23:36 09 Sep 2020

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Precut Construction**, 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 Importance Level : 2 Design Working Life : 50 years

Roof Truss

Timber Group:	Truss Timber	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron 0.55mm	Material:	Standard Plaster Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.220 kPa	Dead Load:	0.210 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 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, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	5220	25.000	900	J06C	1	1812	25.000	900	T08	1	3780	25.000	900
*HB01	1	3774	18.249	900	J06D	1	1812	25.000	900	T08A	1	3780	25.000	900
*HB02	1	7242	18.249	900	J07	1	1267	25.000	900	T09	1	3780	25.000	900
*HB03	1	2023	18.249	900	J07A	1	1267	25.000	900	T10	2	5220	25.000	900
*HB04	1	1252	18.249	900	J07B	1	1267	25.000	900	T11	1	5220	25.000	900
*HB05	2	3445	18.249	900	J07C	1	1267	25.000	900	T12	1	4925	25.000	900
*HB06	2	3162	18.249	900	J07D	1	1267	25.000	900	T12A	1	4925	25.000	900
*HB07	1	5912	18.249	900	PT01	1	2424	0.000	900	T13	1	7260	25.000	900
*HB08	1	1748	18.249	900	*R01	1	1565	25.000	900	T14	1	7270	25.000	900
*HB09	2	5142	18.249	900	*R02	6	913	25.000	900	T15	1	3968	25.000	900
HT01	1	2424	25.000	900	*R02A	5	913	25.000	900	T16	1	3968	25.000	900
HTG01	1	6180	25.000	900 LB	*R03	1	2341	25.000	900	T17	1	3968	25.000	599
HTG02	1	6180	25.000	900	*R04	1	1453	25.000	900	T18	1	1267	-25.000	900
J01	1	1062	25.000	900	*R05	1	1580	25.000	900	T19	6	1267	-25.000	900
J01A	1	1062	25.000	900	*R05A	1	1580	25.000	900	TG01	1	7568	25.000	900
J01B	1	1062	25.000	900	*R06	1	848	25.000	900	TG02	1	3380	25.000	900
J02	1	2752	25.000	900	*R06A	1	848	25.000	900	TG02A	1	3380	25.000	900
J02A	1	2752	25.000	900	*R06B	1	848	25.000	900	TG03	1	4925	25.000	900
J02B	1	2752	25.000	900	*R07	1	6420	25.000	900	TG04	1	3968	25.000	900
J03	1	1852	25.000	900	*R08	1	1525	25.000	900	TR01	1	7568	25.000	900
J03A	1	1852	25.000	900	*R09	10	1455	0.000	765	TR02	1	4925	25.000	900
J04	1	1867	25.000	900	*R10	1	980	25.000	900	TR03	1	3968	25.000	900
J04A	1	1867	25.000	900	*R10A	1	980	25.000	900	V01	1	1454	25.000	900
J04B	1	1867	25.000	900	T01	1	2752	25.000	900	V02	1	2735	25.000	900
J05	1	1667	25.000	900	T02	1	9150	25.000	900	V03	1	1835	25.000	900
J05A	1	1667	25.000	900	T03	1	2424	25.000	900	V04	1	1638	25.000	900
J05B	1	1667	25.000	900	T04	3	9150	25.000	857	V05	1	1463	25.000	900
J06	1	1812	25.000	900	T05	1	9150	25.000	857	V06	1	2380	25.000	900
J06A	1	1812	25.000	900	T06	1	5515	25.000	857	V07	1	883	25.000	900
J06B	1	1812	25.000	900	T07	1	2424	25.000	857	V08	1	918	25.000	900

Total quantity : 119

The computer design input has been carried out by:

Signed: ..... Date: ...Wednesday, 9 September 2020....

Name of Detailer: ..... Qualifications and Title:

On behalf of: Precut Construction
Ph: 03 323 7687

Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street
Prestons Pard
Christchurch
Phone:
Description:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0
MiTek New Zealand Limited
Printed: 13:23:54 09 Sep 2020

TRUSS FIXING SELECTION REPORT - Characteristic Loads

Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data)

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected	
ET01	1	5220	A			Wide		No fixing selected	
*HB01	1	3774							Refer NZS3604:2011 Tables 15.6
*HB02	1	7242							Refer NZS3604:2011 Tables 15.6
*HB03	1	2023							Refer NZS3604:2011 Tables 15.6
*HB04	1	1252							Refer NZS3604:2011 Tables 15.6
*HB05	2	3445							Refer NZS3604:2011 Tables 15.6
*HB06	2	3162							Refer NZS3604:2011 Tables 15.6
*HB07	1	5912							Refer NZS3604:2011 Tables 15.6
*HB08	1	1748							Refer NZS3604:2011 Tables 15.6
*HB09	2	5142							Refer NZS3604:2011 Tables 15.6
HT01	1	2424	F	2.839	1.698	Butt	1	JH 47x90	
			H	2.705	0.687	Butt	1	JH 47x90	
HTG01	1	6180	B	9.944	5.120	Cross	1	CT400	
			L	12.204	6.499	Cross	1	CT400	
HTG02	1	6180	B	14.495	8.604	Cross	1	CT400	
			M	13.863	7.966	Cross	1	CT400	
J01	1	1062	C	0.981	0.000	Butt	1	JH 47x90	
			D	0.380	0.458	Butt	1	Pair of 3.15d Nails	
			B	0.815	0.556	Butt	1	JH 47x90	
J01A	1	1062	G	3.224	0.098	Butt	1	JH 47x90	
			H	1.119	2.578	Butt	1	JH 47x90	
			F	0.533	0.389	Butt	1	Pair of 3.15d Nails	
			E	1.985	1.204	Cross	1	Pair of Wire Dog Staples	
J01B	1	1062	D	0.875	0.000	Butt	1	JH 47x90	
			E	0.273	0.842	Butt	1	JH 47x90	
			C	0.558	0.382	Butt	1	Pair of 3.15d Nails	
			B	2.105	1.434	Cross	1	Pair of Wire Dog Staples	
J02	1	2752	A	2.809	0.727	Cross	1	Pair of Wire Dog Staples	
			E	0.532	0.370	Butt	1	Pair of 3.15d Nails	
			D	3.928	2.405	Cross	1	Pair of Wire Dog Staples	
J02A	1	2752	B	4.658	1.840	Cross	1	Pair of Wire Dog Staples	
			F	2.757	1.761	Butt	1	JH 47x90	
J02B	1	2752	B	4.037	1.054	Cross	1	Pair of Wire Dog Staples	
			F	1.897	1.137	Butt	1	JH 47x90	
			D	0.870	0.552	Butt	1	JH 47x90	
J03	1	1852	B	2.867	0.844	Cross	1	Pair of Wire Dog Staples	
			E	0.999	0.599	Butt	1	JH 47x90	
J03A	1	1852	B	3.150	0.733	Cross	1	Pair of Wire Dog Staples	
			D	0.560	0.045	Butt	1	Pair of 3.15d Nails	
			C	1.441	1.084	Butt	1	JH 47x90	
J04	1	1867	B	2.883	0.850	Cross	1	Pair of Wire Dog Staples	
			E	1.011	0.608	Butt	1	JH 47x90	
J04A	1	1867	B	2.883	0.850	Cross	1	Pair of Wire Dog Staples	
			E	1.011	0.608	Butt	1	JH 47x90	
J04B	1	1867	B	3.164	0.738	Cross	1	Pair of Wire Dog Staples	
			C	1.786	1.138	Butt	1	JH 47x90	
J05	1	1667	B	2.660	0.779	Cross	1	Pair of Wire Dog Staples	
			E	0.846	0.483	Butt	1	JH 47x90	
J05A	1	1667	B	2.660	0.779	Cross	1	Pair of Wire Dog Staples	
			E	0.846	0.483	Butt	1	JH 47x90	
J05B	1	1667	B	2.975	0.668	Cross	1	Pair of Wire Dog Staples	
			C	1.557	1.013	Butt	1	JH 47x90	
J06	1	1812	B	3.112	0.719	Cross	1	Pair of Wire Dog Staples	
			D	0.548	0.044	Butt	1	Pair of 3.15d Nails	
			C	1.402	1.059	Butt	1	JH 47x90	
J06A	1	1812	B	2.875	0.301	Cross	1	Pair of Wire Dog Staples	
			D	0.424	0.513	Butt	1	Pair of 3.15d Nails	
			C	3.210	2.225	Cross	1	Pair of Wire Dog Staples	
J06B	1	1812	B	2.875	0.301	Cross	1	Pair of Wire Dog Staples	
			D	0.424	0.512	Butt	1	Pair of 3.15d Nails	
			C	3.210	2.225	Cross	1	Pair of Wire Dog Staples	
J06C	1	1812	B	2.822	0.830	Cross	1	Pair of Wire Dog Staples	
			E	0.967	0.574	Butt	1	JH 47x90	
J06D	1	1812	B	2.825	0.030	Cross	1	Pair of Wire Dog Staples	
			F	0.638	0.455	Butt	1	Pair of 3.15d Nails	
			C	3.035	2.122	Cross	1	Pair of Wire Dog Staples	
			E	1.442	1.091	Cross	1	Pair of Wire Dog Staples	
J07	1	1267	B	2.591	0.518	Cross	1	Pair of Wire Dog Staples	
			D	0.376	0.030	Butt	1	Pair of 3.15d Nails	
			C	0.820	0.710	Butt	1	JH 47x90	
J07A	1	1267	B	2.497	0.189	Cross	1	Pair of Wire Dog Staples	
			E	0.376	0.030	Butt	1	Pair of 3.15d Nails	
			D	0.484	0.278	Butt	1	Pair of 3.15d Nails	
			C	1.994	1.615	Cross	1	Pair of Wire Dog Staples	
J07B	1	1267	B	2.412	0.620	Cross	1	Pair of Wire Dog Staples	
			D	0.583	0.227	Butt	1	Pair of 3.15d Nails	

Precut Construction

Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street, Prestons Pard, Christchurch
Phone:
Description:
Building Consent No.:

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J07C	1	1267	B	2.412	0.620	Cross	1	Pair of Wire Dog Staples
			D	0.583	0.227	Butt	1	Pair of 3.15d Nails
J07D	1	1267	B	2.492	0.000	Cross	1	Pair of Wire Dog Staples
			F	0.376	0.030	Butt	1	Pair of 3.15d Nails
			E	0.587	0.418	Butt	1	Pair of 3.15d Nails
			C	1.838	1.520	Cross	1	Pair of Wire Dog Staples
			D	1.690	1.060	Cross	1	Pair of Wire Dog Staples
PT01	1	2424	D	1.870	0.805	Butt	1	JH 47x90
			F	0.845	0.740	Butt	1	JH 47x90
			E	2.476	1.271	Cross	1	Pair of Wire Dog Staples
*R01	1	1565						Refer NZS3604:2011 Tables 15.6
*R02	6	913						Refer NZS3604:2011 Tables 15.6
*R02A	5	913						Refer NZS3604:2011 Tables 15.6
*R03	1	2341						Refer NZS3604:2011 Tables 15.6
*R04	1	1453						Refer NZS3604:2011 Tables 15.6
*R05	1	1580						Refer NZS3604:2011 Tables 15.6
*R05A	1	1580						Refer NZS3604:2011 Tables 15.6
*R06	1	848						Refer NZS3604:2011 Tables 15.6
*R06A	1	848						Refer NZS3604:2011 Tables 15.6
*R06B	1	848						Refer NZS3604:2011 Tables 15.6
*R07	1	6420						Refer NZS3604:2011 Tables 15.6
*R08	1	1525						Refer NZS3604:2011 Tables 15.6
*R09	10	1455						Refer NZS3604:2011 Tables 15.6
*R10	1	980						Refer NZS3604:2011 Tables 15.6
*R10A	1	980						Refer NZS3604:2011 Tables 15.6
T01	1	2752	B	2.498	1.194	Cross	1	Pair of Wire Dog Staples
			F	2.288	1.398	Butt	1	JH 47x90
T02	1	9150	B	8.542	4.528	Cross	1	CT400
			J	8.542	4.528	Cross	1	CT400
T03	1	2424	D	2.067	1.694	Butt	1	JH 47x90
			F	2.658	0.301	Butt	1	JH 47x90
T04	3	9150	B	8.135	4.312	Cross	3	CT400
			J	8.135	4.312	Cross	3	CT400
T05	1	9150	A	8.486	4.269	Cross	1	CT400
			O	15.023	9.152	Cross	1	CT400
			K	3.237	1.923	Cross	1	Pair of Wire Dog Staples
T06	1	5515	H	4.340	2.864	Butt	1	JH 47x90
			F	4.860	2.293	Cross	1	Pair of Wire Dog Staples
T07	1	2424	D	1.930	1.798	Butt	1	JH 47x90
			F	2.479	0.156	Butt	1	JH 47x90
T08	1	3780	B	4.603	2.802	Cross	1	Pair of Wire Dog Staples
			F	5.239	2.846	Cross	1	Pair of Wire Dog Staples
T08A	1	3780	A	10.089	6.425	Cross	1	CT400
			E	5.001	2.785	Cross	1	Pair of Wire Dog Staples
T09	1	3780	A	3.126	1.843	Cross	1	Pair of Wire Dog Staples
			C	4.079	1.906	Cross	1	Pair of Wire Dog Staples
T10	2	5220	A	4.358	2.550	Cross	2	Pair of Wire Dog Staples
			E	5.274	2.609	Cross	2	Pair of Wire Dog Staples
T11	1	5220	A	14.655	8.773	Cross	1	CT400
			G	13.957	7.987	Cross	1	CT400
T12	1	4925	A	4.190	2.285	Butt	1	JH 47x90
			G	5.152	2.597	Butt	1	JH 47x90
T12A	1	4925	A	4.198	2.252	Butt	1	JH 47x90
			G	3.614	2.432	Butt	1	JH 47x90
			F	0.892	0.138	Cross	1	Pair of Wire Dog Staples
T13	1	7260	H	5.965	2.263	Cross	1	Pair of Wire Dog Staples
			N	5.407	2.219	Cross	1	Pair of Wire Dog Staples
			K	1.266	0.558	Cross	1	Pair of Wire Dog Staples
T14	1	7270	A	2.805	1.678	Butt	1	JH 47x90
			R	7.220	2.375	Cross	1	Pair of Wire Dog Staples
			J	9.262	5.291	Cross	1	CT400
			O	2.932	1.441	Cross	1	Pair of Wire Dog Staples
T15	1	3968	A	3.451	1.785	Cross	1	Pair of Wire Dog Staples
			F	3.288	2.100	Butt	1	JH 47x90
T16	1	3968	A	6.652	2.863	Cross	1	Pair of Wire Dog Staples
			G	6.476	4.070	Butt	1	JH 47x90
T17	1	3968	A	2.297	1.188	Cross	1	Pair of Wire Dog Staples
			F	2.188	1.398	Butt	1	JH 47x90
T18	1	1267	D	1.303	0.529	Butt	1	JH 47x90
			B	2.623	0.832	Cross	1	Pair of Wire Dog Staples
T19	6	1267	E	2.405	1.361	Butt	6	JH 47x90
			A	0.783	0.396	Butt	6	Pair of 3.15d Nails
			C	2.486	0.539	Cross	6	Pair of Wire Dog Staples
TG01	1	7568	M	4.668	3.262	Butt	1	JH 47x90
			R	15.570	11.896	Cross	1	CT400
			F	5.118	2.424	Cross	1	Pair of Wire Dog Staples
TG02	1	3380	A	3.721	2.408	Cross	1	Pair of Wire Dog Staples
			E	3.721	2.408	Cross	1	Pair of Wire Dog Staples
TG02A	1	3380	A	3.293	0.712	Cross	1	Pair of Wire Dog Staples
			E	4.180	0.766	Cross	1	Pair of Wire Dog Staples
TG03	1	4925	B	7.549	4.324	Cross	1	CT400
			I	9.038	5.820	Butt	1	Pair of MultiGrips
TG04	1	3968	A	4.065	2.799	Cross	1	Pair of Wire Dog Staples
			G	4.588	3.069	Butt	1	JH 47x90
TR01	1	7568	I	4.934	2.972	Butt	1	JH 47x90
			G	5.725	2.957	Cross	1	Pair of Wire Dog Staples
			M	3.011	1.531	Cross	1	Pair of Wire Dog Staples

Precut Construction

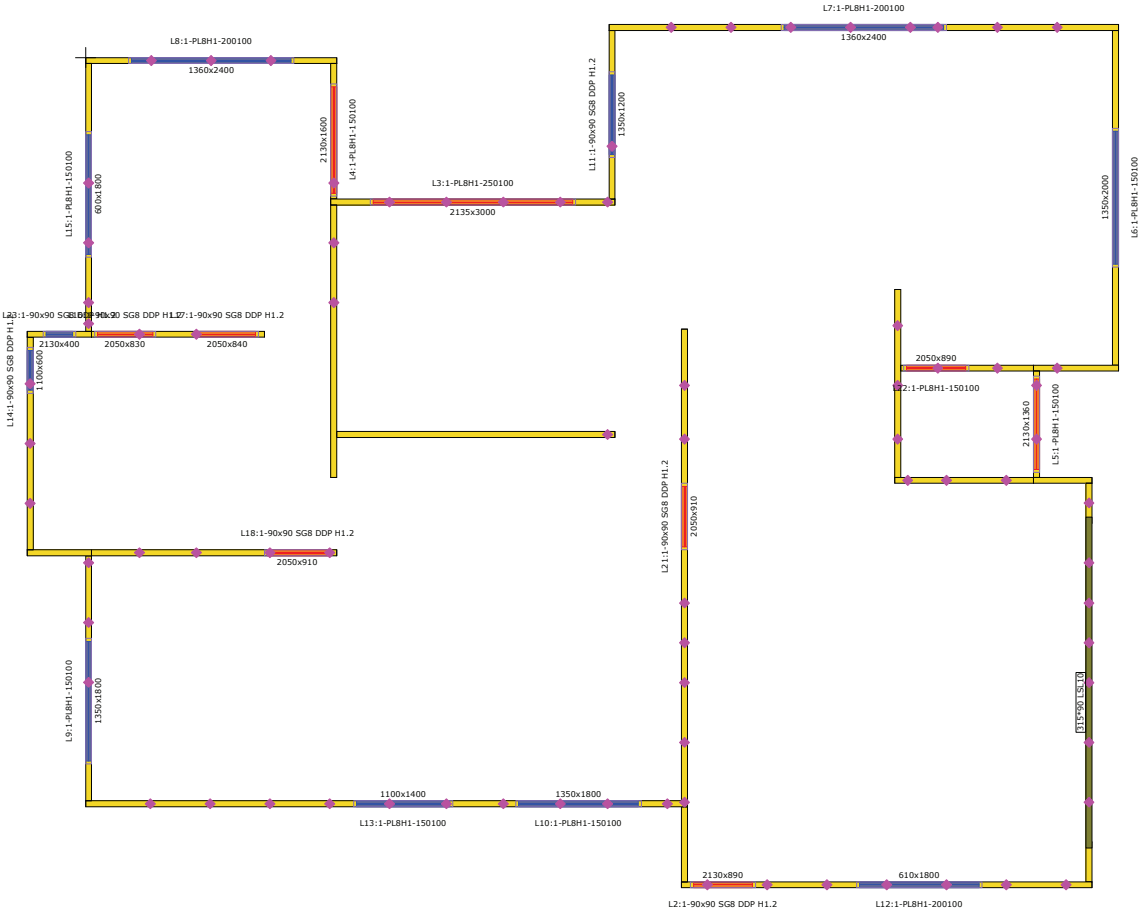
Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street
Prestons Pard
Christchurch
Phone:
Description:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0
MiTek New Zealand Limited
Printed: 13:23:55 09 Sep 2020

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
TR02	1	4925	A	4.159	2.269	Butt	1	JH 47x90
			J	4.076	2.555	Butt	1	JH 47x90
TR03	1	3968	A	3.346	1.818	Cross	1	Pair of Wire Dog Staples
			F	3.347	2.067	Butt	1	JH 47x90
V01	1	1454	A			Wide		No fixing selected
V02	1	2735	A			Wide		No fixing selected
V03	1	1835	A			Wide		No fixing selected
V04	1	1638	A			Wide		No fixing selected
V05	1	1463	A			Wide		No fixing selected
V06	1	2380	A			Wide		No fixing selected
V07	1	883	A			Wide		No fixing selected
V08	1	918	A			Wide		No fixing selected

Fixing List

Qty	Selected Fixing
51	JH 47x90
20	CT400
22	Pair of 3.15d Nails
69	Pair of Wire Dog Staples
1	Pair of MultiGrips
9	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.



PRECUT CONSTRUCTION LTD
Framing & Trusses Specialists

9 Empire Road
Belfast
Christchurch
New Zealand

Phone: (03) 323 7687

Sheet Tittle: **Framing Layout for Building Consent**

OT No.:	**PC20232-Q-01**	Name:	
Address:	Hoffman Street , Prestons Park Christchurch		
Wind Area:	High	Design Wind Speed: 44.0 m/s	

MiTek SAPPHIRE™ Ver. 8.4.1
Better Technology. Better Building.

Building Consent No.:	Structure: PC20232-ST-01
Drawn By:	Date: 9/09/2020

Precut Construction

Client: Lara van Drongelen
Phone:

Site:
Hoffman Street
Prestons Park
Christchurch

MiTek SAPPHIRE™ 8.4.1.207.Update3 Printed: 13:29:40 09-09-2020

LINTEL SUMMARY

This Lintel Summary is issued by MiTek accredited fabricator Precut Construction being licensed to use the MiTek SAPPHIRE™ software, and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

Design Parameters

The MiTek SAPPHIRE™ design for this job is based on the following design parameters entered into the program. The Detailer/Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek SAPPHIRE™ lintels.

Job Details

Importance Level : 2 **Design Working Life :** 50 years

Details :
Roof Pitch : 20.000 °
Ceiling Pitch : 0.000 °
Overhang : 0 mm
Truss Spacing : 0 mm

Loading :
Roof : Galv Iron 0.55mm 0.19 kPa
Ceiling : Standard Plaster Board 10mm 0.16 kPa
Wind : High 44.0 m/s **Cpe :** Varies **Cpi :** Varies
Snow : N4 (Sub-Alpine) at 100.000 m
Open Ground Snow (Sg) : 0.900 kPa

Lintel Schedule

Label	Span (mm)	Size	Opening (HxW)	Panel	Level	Design Status
L8:1-PL8H1-200100	2490	1/PL8H1-200100	1360x2400	E1	Ground Floor	Designed
L4:1-PL8H1-150100	1690	1/PL8H1-150100	2130x1600	E2	Ground Floor	Designed
L3:1-PL8H1-250100	3090	1/PL8H1-250100	2135x3000	E3	Ground Floor	Designed
L11:1-90x90 SG8 DDP H1.2	1290	1/90x90 SG8 DDP H1.2	1350x1200	E4	Ground Floor	Designed
L7:1-PL8H1-200100	2490	1/PL8H1-200100	1360x2400	E5	Ground Floor	Designed
L6:1-PL8H1-150100	2090	1/PL8H1-150100	1350x2000	E6	Ground Floor	Designed
L5:1-PL8H1-150100	1450	1/PL8H1-150100	2130x1360	E8	Ground Floor	Designed
L2:1-90x90 SG8 DDP H1.2	980	1/90x90 SG8 DDP H1.2	2130x890	E12	Ground Floor	Designed
L12:1-PL8H1-200100	1890	1/PL8H1-200100	610x1800	E12	Ground Floor	Designed
L10:1-PL8H1-150100	1890	1/PL8H1-150100	1350x1800	E14	Ground Floor	Designed
L13:1-PL8H1-150100	1490	1/PL8H1-150100	1100x1400	E14	Ground Floor	Designed
L9:1-PL8H1-150100	1890	1/PL8H1-150100	1350x1800	E15	Ground Floor	Designed
L14:1-90x90 SG8 DDP H1.2	690	1/90x90 SG8 DDP H1.2	1100x600	E17	Ground Floor	Designed
L23:1-90x90 SG8 DDP H1.2	490	1/90x90 SG8 DDP H1.2	2130x400	E18	Ground Floor	Designed
L15:1-PL8H1-150100	1890	1/PL8H1-150100	600x1800	E19	Ground Floor	Designed
L16:1-90x90 SG8 DDP H1.2	920	1/90x90 SG8 DDP H1.2	2050x830	P17	Ground Floor	Designed
L17:1-90x90 SG8 DDP H1.2	930	1/90x90 SG8 DDP H1.2	2050x840	P17	Ground Floor	Designed
L18:1-90x90 SG8 DDP H1.2	1000	1/90x90 SG8 DDP H1.2	2050x910	P18	Ground Floor	Designed
L21:1-90x90 SG8 DDP H1.2	1000	1/90x90 SG8 DDP H1.2	2050x910	P21	Ground Floor	Designed
L22:1-PL8H1-150100	980	1/PL8H1-150100	2050x890	P24	Ground Floor	Designed

Total Quantity: 20

The lintel design input has been carried out by:

Signed: Date: Wednesday, 9 September 2020

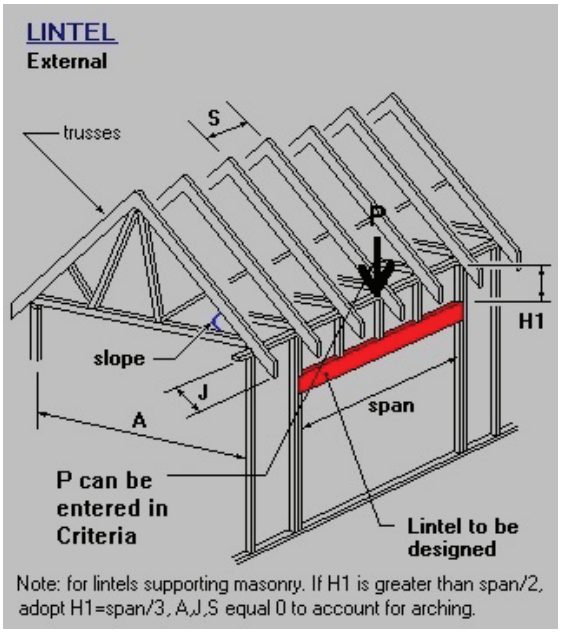
Date: 31/8/20 10:37 AM
Designed By: Precut Construction
Designer: Rebecca McKenzie
Email: sales@precut.co.nz
9 Empire Road
Kainga, Canterbury, 7644, New Zealand

Member: Garage Beam
Project: Lara vanDrongelen
Project Number: PC20232
Project Address: Haffman Street, Prestons Park

SPANMAN DESIGN CERTIFICATE

LumberworX ENGINEERED WOOD PRODUCTS SOFTWARE RELEASE 22.05.2017	9 Hickory Pl Islington, Christchurch 8042 New Zealand Certificate valid only if product sourced from Lumberworx

Single Span 315 deep x 90 wide Laminated Strand Lumber E10



This certificate may be submitted to a Building Consent Authority with an application for a Building Consent.Installation can only occur when a Building Consent has been issued by the relevant Building Consent Authority.
Country: New Zealand
Building type: House - domestic dwelling
Design working life: 50 years
Building Type Importance: 2 - Normal structures and structures not falling into other levels
Roof Use: Normal roof
Roof live load: 0.25 kPa, Roof live load: 1.1 kN

Wind region is High (44m/s ultimate)
V_{des}(serviceability) = 35 m/s
V_{des}(ultimate) = 44 m/s

Span = 4,800 mm
A = 1,312 mm (roof span)
J = 600 mm (roof overhang)
H1 = 0 mm (lower wall height)
E = 0 mm (floor span)
K = 0 mm (floor overhang)
S = 900 mm (truss/rafter spacing)

Roof weight(0.50 mm steel sheet) = 5 kg/m^2
Roof ceiling(10 mm plaster, pink batt insulation, wiring + sisalation + fittings) = 14 kg/m^2
Roof self weight(trusses/rafters) = 9.1 kg/m^2
H1 weight(NZS 3604 Light wall cladding (e.g. weatherboards)) = 40 kg/m^2

Snow Load (AS/NZS 1170.3:2003)

Region: N4 (Sub-Alpine)
Importance level(House - domestic dwelling) = 2
Design working life = 50 years
h_0 = 100 m
C_e(4.2.2 - sheltered roofs) = 1.0
Snow load(serviceability) = 0.4 kPa
Snow load(ultimate) = 0.887 kPa

Design Criteria

- The Lintel is to be installed by a Licensed Building Practitioner (carpentry) or under supervision of an LBP
- The top of the Lintel is to be restrained by studs at 600 mm centres
- The ends of the Lintel are to be securely supported and prevented from rotation
- The Lintel is to be a single member that is 4,800mm long
- The Lintel is to have no notches throughout its length unless referenced in standards or manufacturers literature
- The Lintel is to have an end bearing length of 45mm or greater

Serviceability Criteria (+upward, -downward)

	Span Deflection	Allowable Span Deflection

Deflection Dead Load	2.476 mm	span/300 ± 0% and 12 mm ± 0%
Deflection Live Load	2.41 mm	span/250 ± 0% and 15 mm ± 0%
Deflection Wind Down	0 mm	span/200 ± 0%
Deflection Wind Up	2.57 mm	span/200 ± 0%

Reactions (+upward, -downward)

Maximum limit state downward reaction = 6.515 kN
Maximum limit state upward reaction (wind uplift) = -2.379 kN

SpanMan complies with the requirements of the following standards:

- AS/NZS 1170.0:2002 Structural design actions, Parts 0 and 1
- AS/NZS 1170.2:2011 Structural design actions, Part 2: Wind Actions
- AS/NZS 1170.3:2003 Structural design actions, Part 3: Snow and ice actions
- NZS 3603:1993 Timber Structures Standard
- NZS 3604:2011 Timber Framed Buildings Standard
- AS/NZS 4055 - 2006 Wind loads for housing
- AS/NZS 4600 - 2005 Cold-formed steel structures
- Nash Standard: Residential and Low-Rise Steel Framing Part 1: Design Criteria 2005
- AS1720.1 - 2010 Timber Structures, Part 1: Design methods

Sizes calculated by SpanMan assume that members are installed in a manner that suits their intended structural function for the life of the structure. Members should be maintained in accordance with Australian and New Zealand standards for the life of the structure.

SpanMan does not take into account member durability or required treatments for your application. These include, but are not limited to, materials subject to wetting and drying, in or below ground applications and corrosive environments. Contact product manufacturers or timber and steel institutes for advice.

All Lumberworx products are suited to the H1.2 hazard zone.

This design certificate is void where there has been a substitution of an alternative product/material not detailed, or if used for an alternative wind or snow loading other than stated.

Spanware Pty Ltd gives no warranties in relation to the use of the section design specified this certificate and neither Spanware Pty Ltd, or Lumberworx, will accept any liability for loss or damage, either direct or consequential arising from the use of the above nominated section in an application not consistent with the input data used to generate this report or that requires additional data beyond the scope of SpanMan software.

For further information or advice please contact SpanMan at http://spanman.net/about/contact

BRACING

Demand Calculation Sheet

Job Details

Name:	Bunn
Street and Number:	Hoffman Park
Lot and DP Number:	Lot 460 DP 549008
City/Town/District:	Christchurch
Designer:	AS
Company:	
Date:	30/09/20

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.61
Building Height to Apex (m)	5.02
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	17.63
Building Width (m)	14.20
Building Plan Area (m²)	184.7

Building Location

Wind Zone = High

Earthquake Zone 2

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	**764**	**971**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1124**

Single Level Along Resistance Sheet

Job Name: Bunn

									Wind	EQ
									Demand	
									764	1124
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1079 141%	1167 104%
a	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	1.20		2.4	EP1 1.2	CHH	144	162		
	External Length = 11.45								315 OK	351 OK
b	1	0.40		2.4	BL1-H	GIB®	36	40		
	2	1.10		2.4	EP1 0.6	CHH	105	116		
	External Length = 2.07								140 OK	156 OK
c	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	2.00		2.4	GS1-N	GIB®	138	120		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 1.67								252 OK	246 OK
d	1	1.20		2.4	EP1 1.2	CHH	144	162		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	0.60		2.4	EP1 0.6	CHH	57	63		
	5	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 15.15								372 OK	414 OK

Single Level Across Resistance Sheet

Job Name: Bunn

									Wind	EQ
									Demand	
									971	1124
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1106 114%	1147 102%
m	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	0.60		2.4	EP1 0.6	CHH	57	63		
	5	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 11.28								285 OK	315 OK
n	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	0.40		2.4	EP1 0.4	CHH	32	38		
	External Length = 2.13								156 OK	146 OK
o	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 3.85								171 OK	189 OK
p	1	1.40		2.4	BL1-H	GIB®	179	146		
									179 OK	146 OK
q	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	1.20		2.4	EP1 1.2	CHH	144	162		
	External Length = 13.00								315 OK	351 OK

GIB® EzyBrace® Systems

Specification and installation manual

CBI 5113

AUGUST 2016

NATIONAL SUPPORT

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GIB® HELPLINE

0800 100 442

Based on learnings derived from the 2011 Canterbury earthquakes GIB EzyBrace® Systems have been updated to offer improved design flexibility and further simplification of the bracing design and build process.

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

- Improved user interface with simplified bracing design process.
- Increased functionality including exterior line check function, easy insert/deletion of bracing elements and built in software help function.
- Includes the new GIB® Bracing element GS2- NOM
- Allows the GIBFix® Framing System to be used in GIB EzyBrace® designs.

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

- Large hole specification updated to use a more conservative methodology.
- Guidance included for fireplace flues and range hoods.

NEW — GIBFIX® FRAMING SYSTEM

- Reduced potential for fastener pop and joint cracking as a result of timber frame movement.
- Reduced potential for on-site call backs.
- Improved thermal performance.
- Reinforced plasterboard junctions.

BRANZ Appraised
Appraisal No.928 [2016]

CONTENTS

GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until futher notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

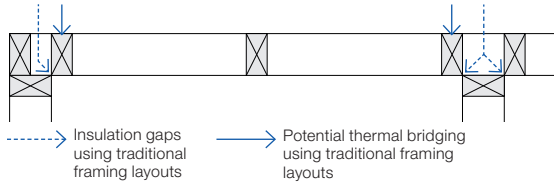
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

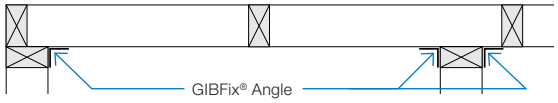
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 — DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 — ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

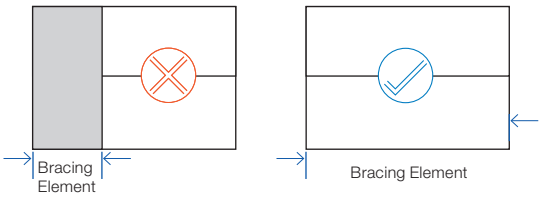
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

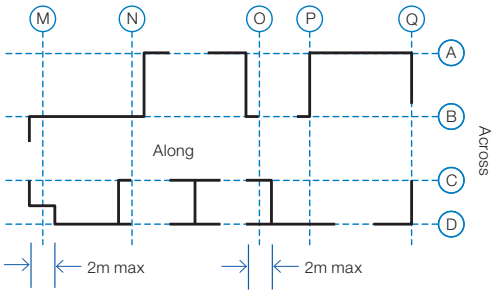
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 ‘rules’ are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®.
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- ‘N’ stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15-16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

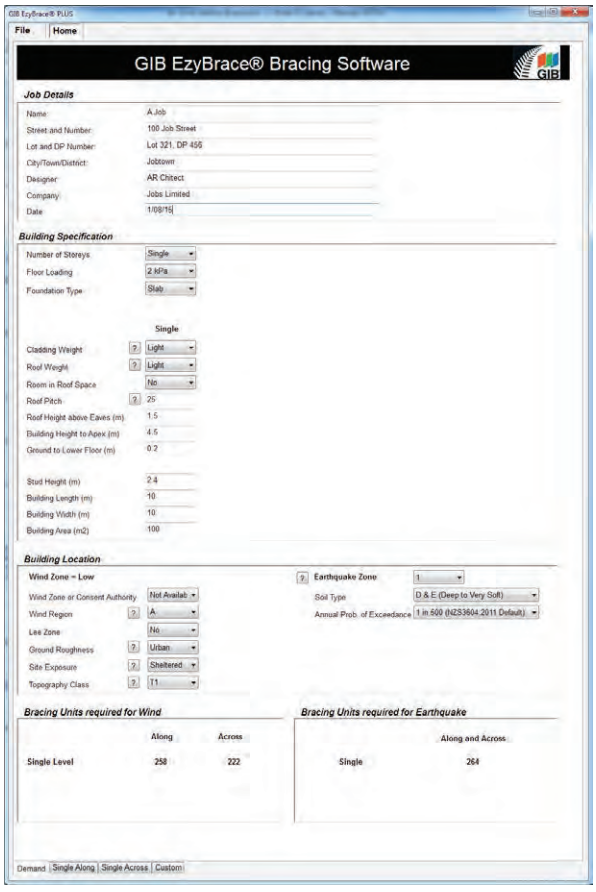
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

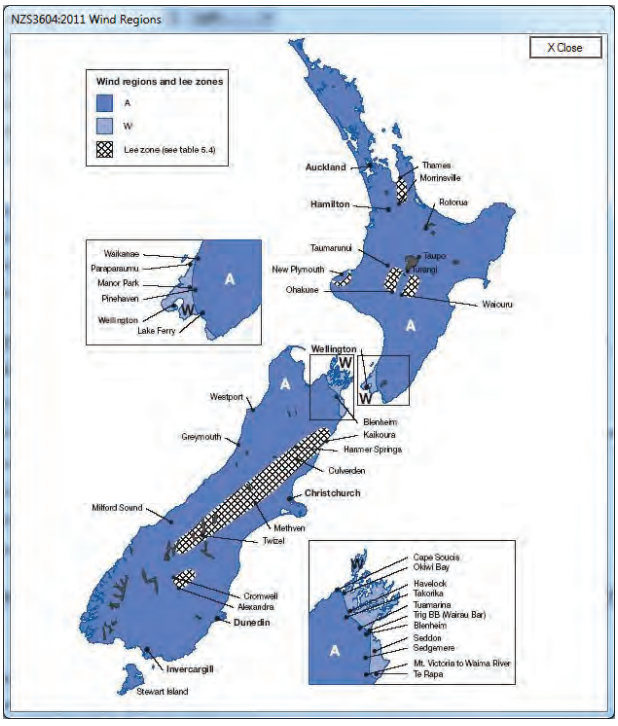
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 — DEMAND CALCULATION SHEET AND 'POP UP' HELP FACILITY





Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

Innovations adopted in the GIB EzyBrace® 2016 bracing 'resistance' calculation sheets include the ability to easily add and delete lines and elements during calculations.

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

Figures 6 and 7 show screen shots of the Wall and Subfloor Resistance Sheets respectively.

FIGURE 6: GIB EZYBRACE® 2016 — WALL BRACING RESISTANCE CALCULATION SHEET

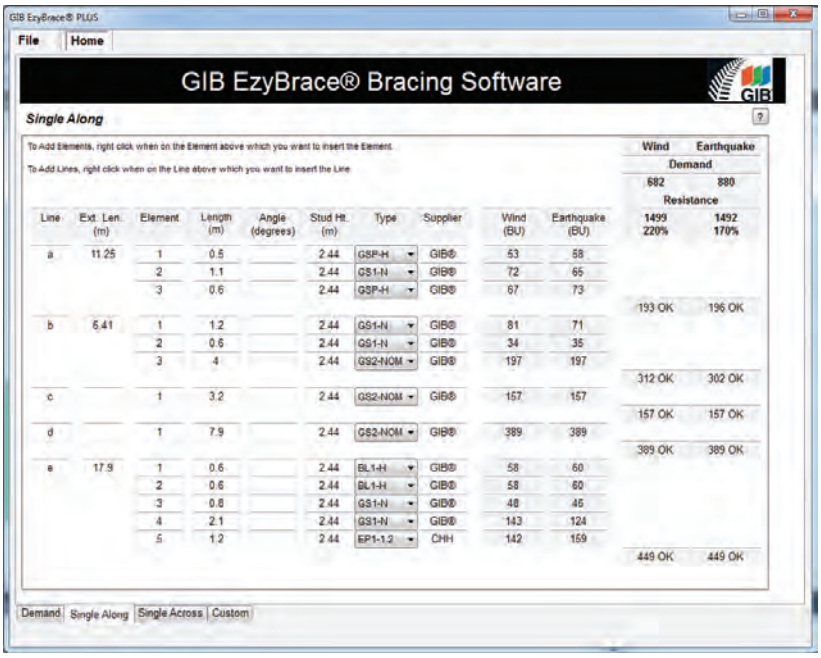
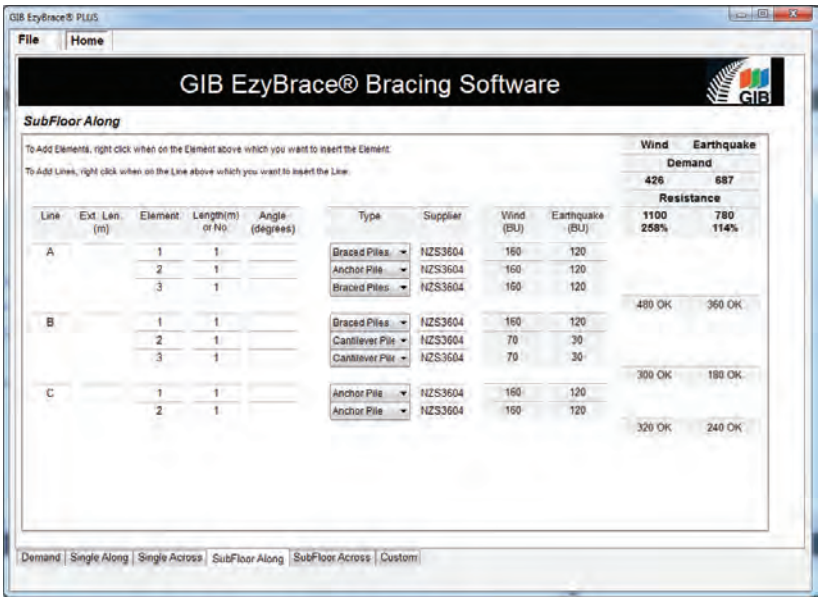


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

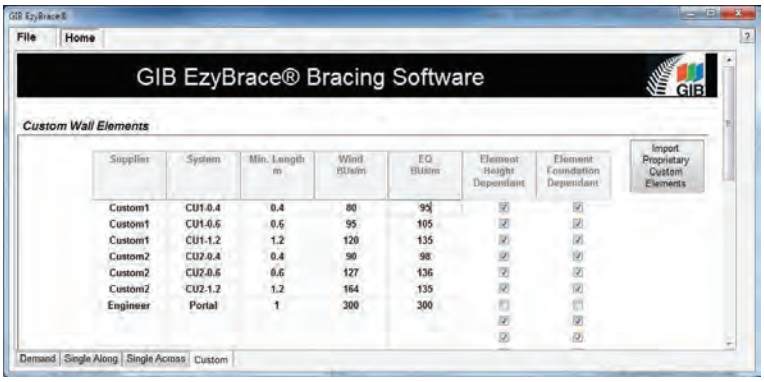


Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

Custom elements can be entered by accessing the 'custom' tab as shown in figure 8.

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

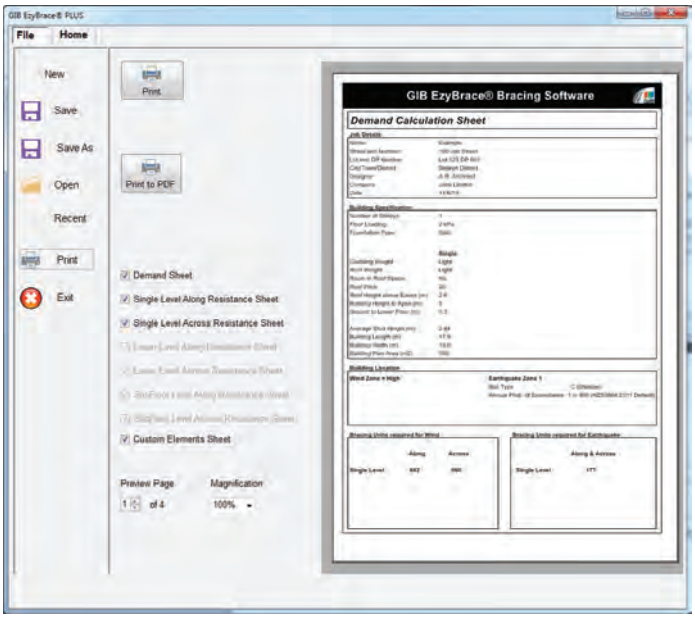
Help can be accessed by pressing the ? symbol which displays a window with further information.

The GIB EzyBrace® 2016 software has a number of options that can be accessed via the File tab at the top left hand corner of the window. The options include: New, Save, Save As, Open, Recent and Print.

- The New option closes any opened job ready for the input of a new job.
- The Save option saves the currently opened job to the same filename and the Save As option saves the job to a new filename.
- The Open option prompts for the name of an existing job.
- The Recent option displays a list of the ten latest jobs and allows for the selection of one of these jobs to be opened.
- The Print option displays the print screen. In this screen, a print preview is displayed. The print preview can be copied to the clipboard by clicking the right-hand mouse button. Also on the print screen is the option to choose which pages are to be printed and the option to print the output to a portable data format, PDF, file.
- The Print Screen View is shown in figure 9.

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace



GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For futher design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

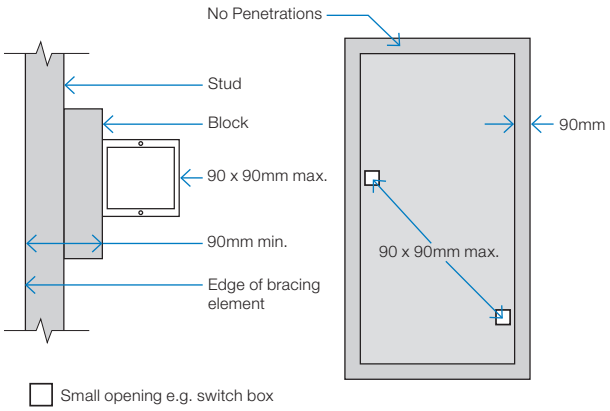
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

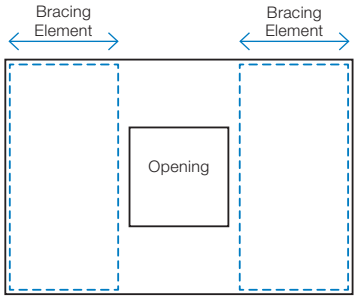
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

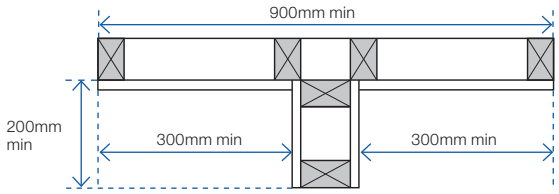
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

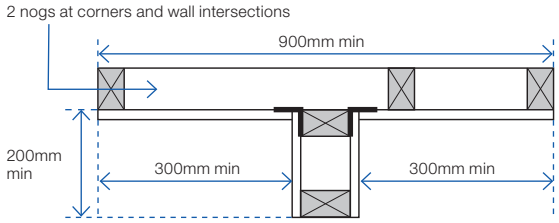
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



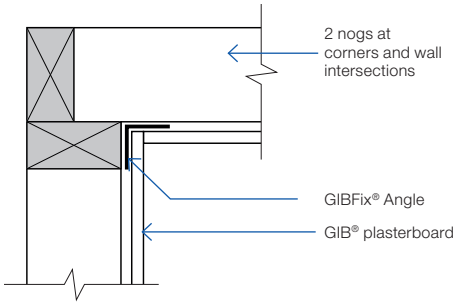
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



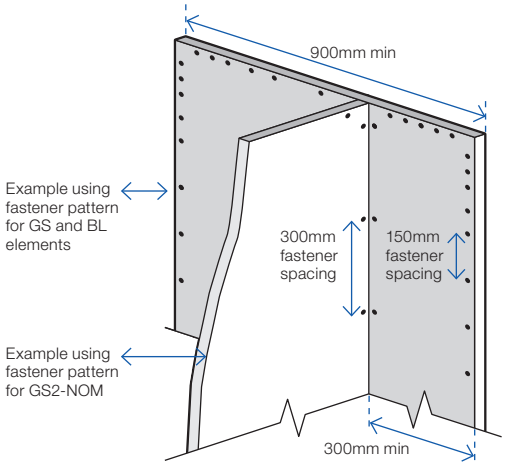
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

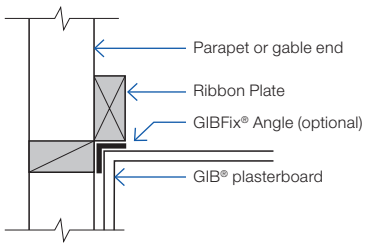
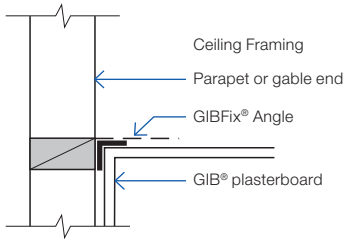


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



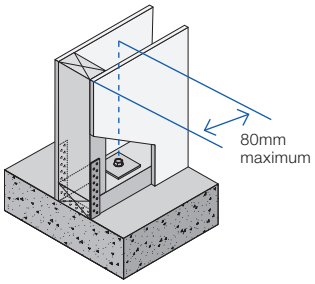
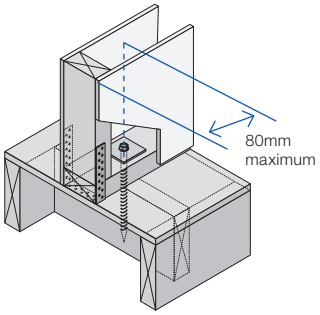
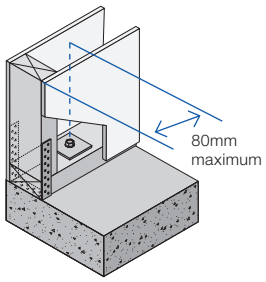
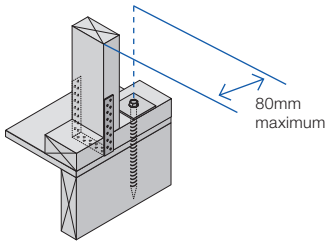
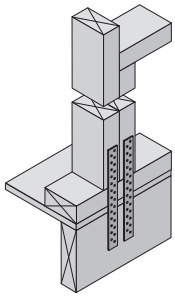
GFS003

BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

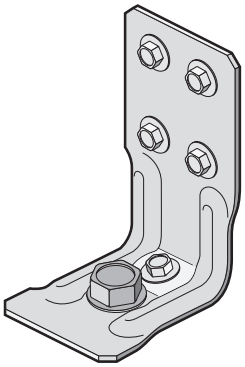
Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

Concrete floor	Timber floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

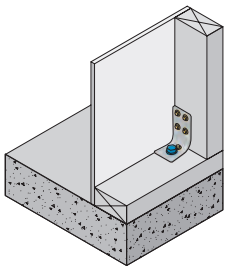
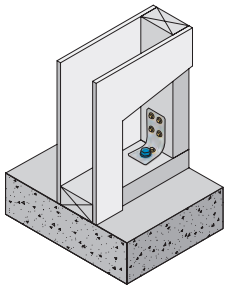
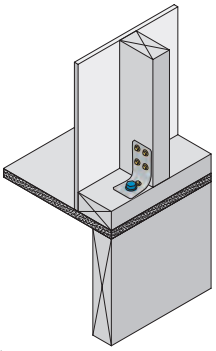
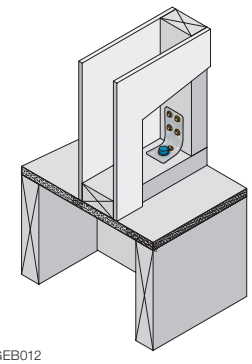
GIB HandiBrac® installation



Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.

Concrete floor		Timber floor	
External walls	Internal walls	External walls	Internal walls
 GEB009	 GEB010	 GEB011	 GEB012
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	Position GIB HandiBrac® in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.	

GIB HandiBrac® placement with GIBFix® Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac® panel hold-down brackets within the GIBFix® Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac® can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

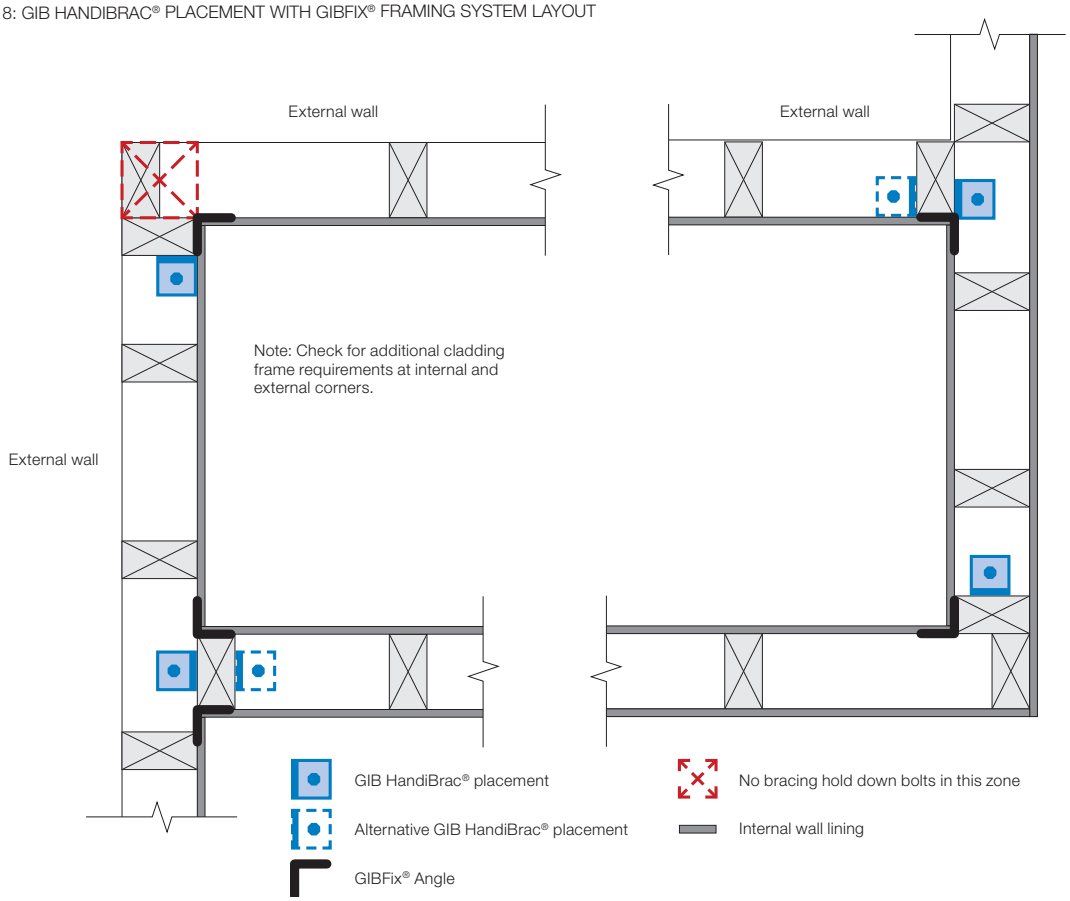
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

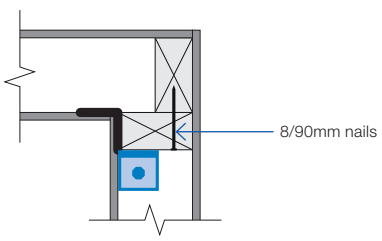
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC® PLACEMENT WITH GIBFIX® FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

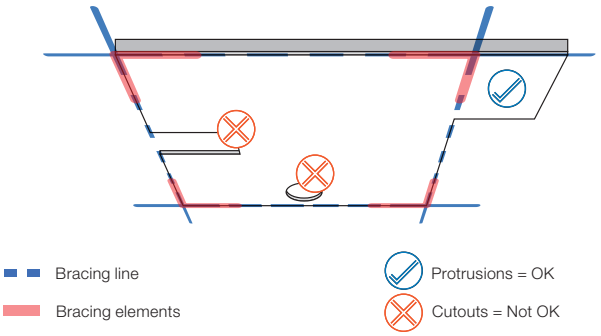


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

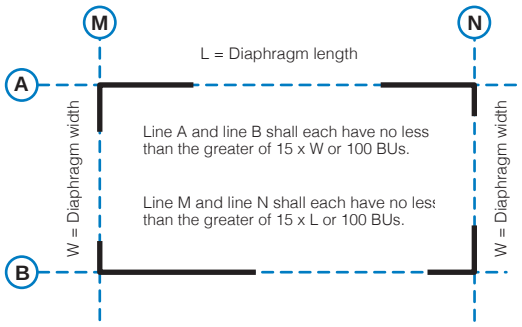
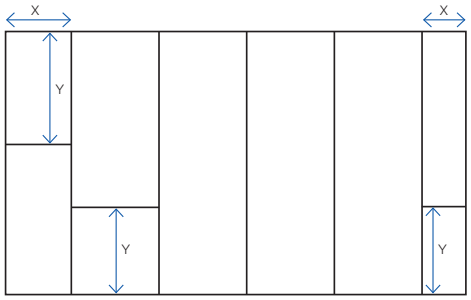


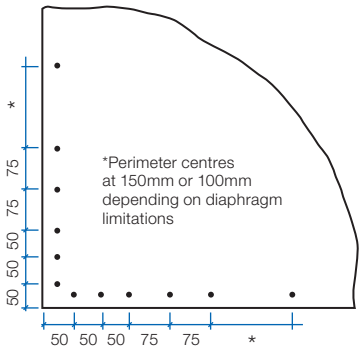
FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.

Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

Ceiling battens in ceiling diaphragms

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:
- 500mm for 10mm GIB® plasterboard.
- 600mm for 13mm GIB® plasterboard.

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

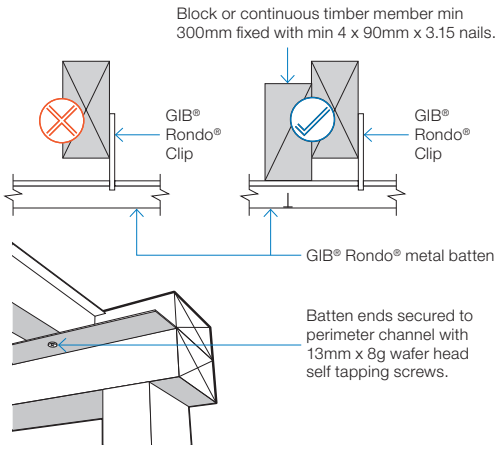
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

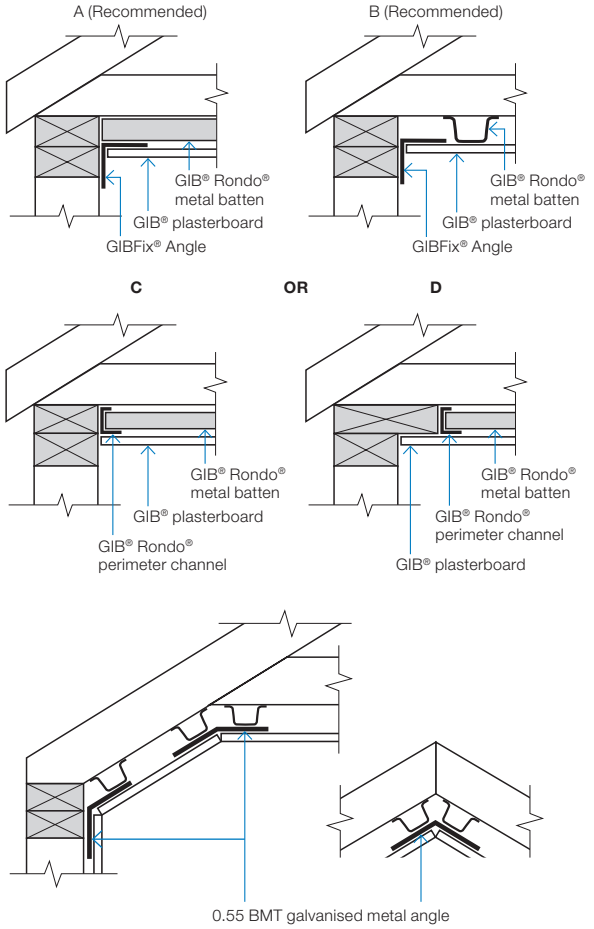
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



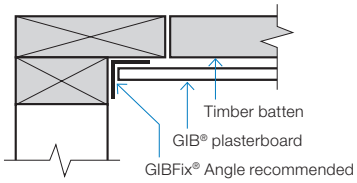
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed withing the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvansed metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

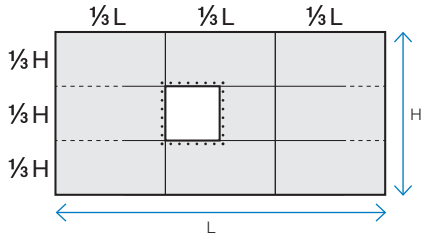
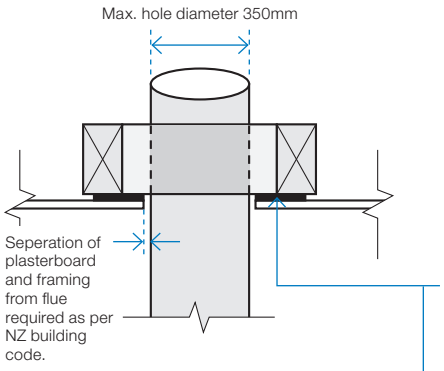
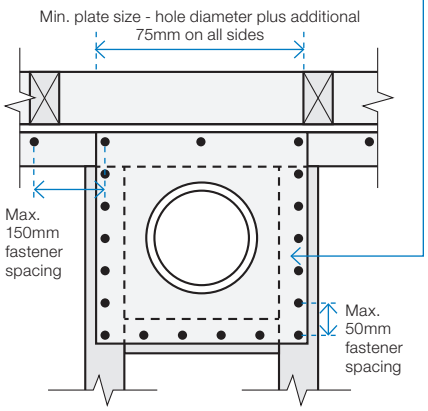


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Steel plate
0.55 BMT Galvanised sheet Max. opening 350mm diameter. Installed prior to GIB® plasterboard.

Framing
90 x 45mm framing trimmed to provide extra fixing.

GIB® plasterboard ceiling
Installed over the steel plate and into framing using a minimum of 32mm x 6g GIB® Grabber High Thread or 32mm x 7g GIB® Grabber Dual Thread screws at 50mm max centre spacing.

Plasterboard ceiling not shown in plan view

Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

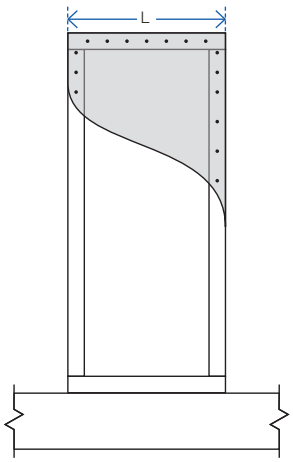
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

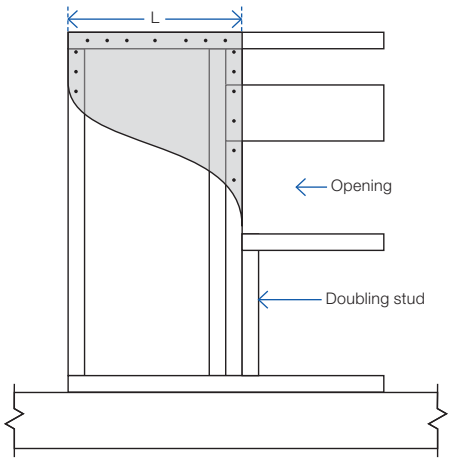
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



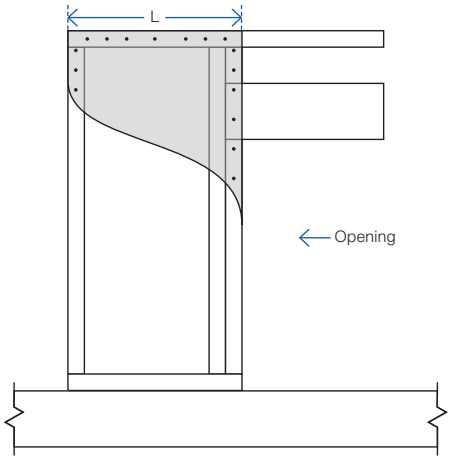
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



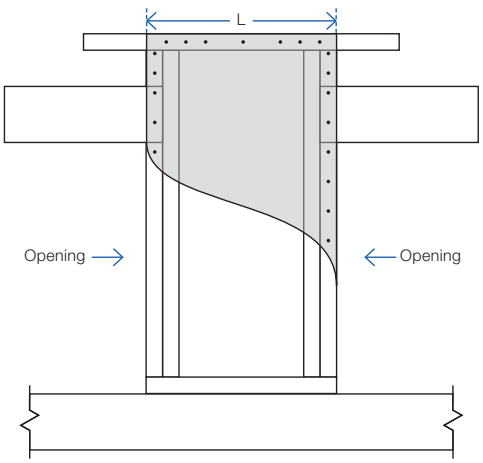
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

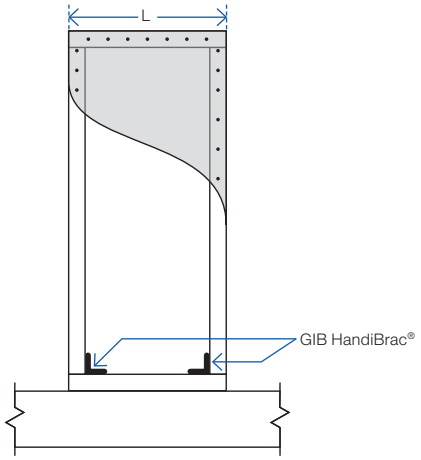
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34-36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB HandiBrac® bolt.

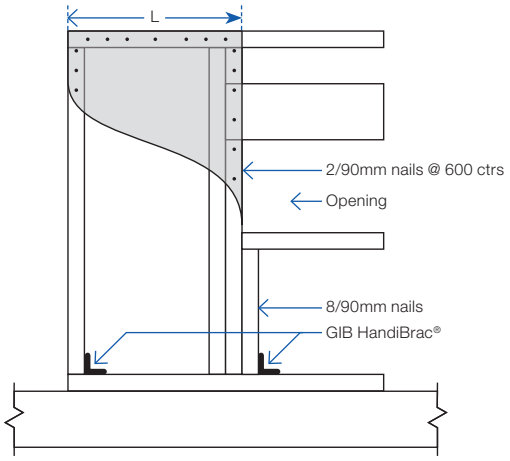
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



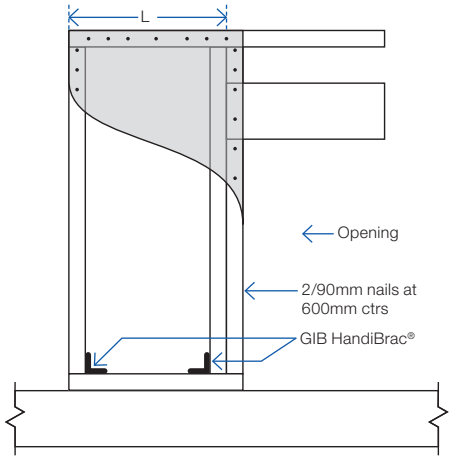
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



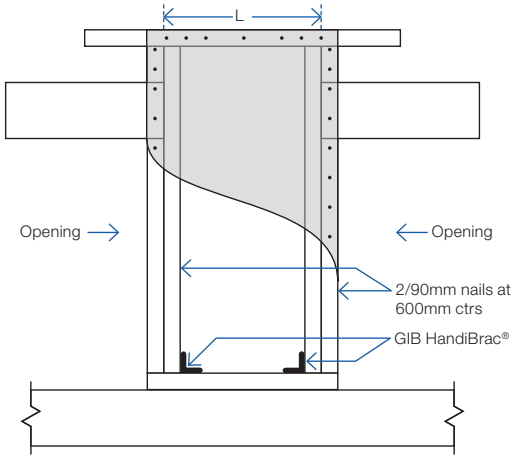
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

GIB EzyBrace® Systems specification GS1-N

Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

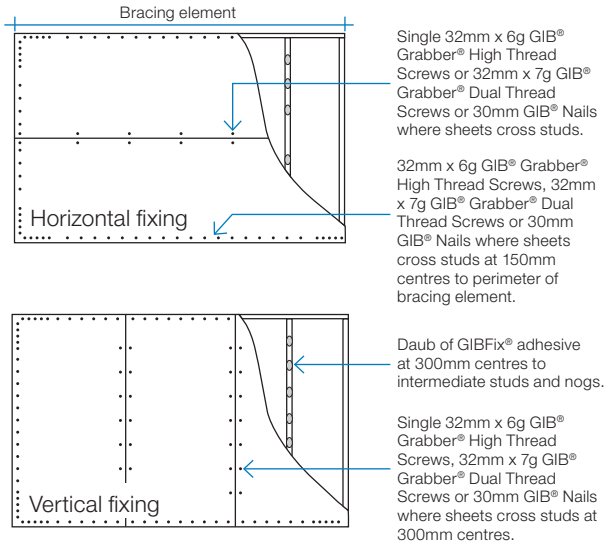
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

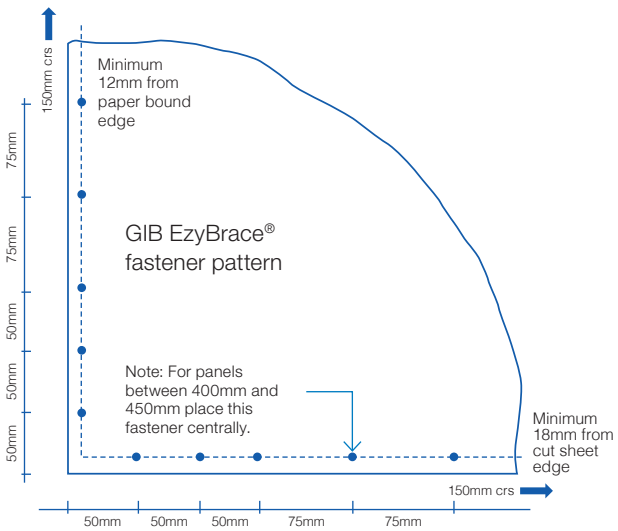
Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100mm x 3.75mm nails at 600mm centres; or three power driven 90mm x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75mm x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

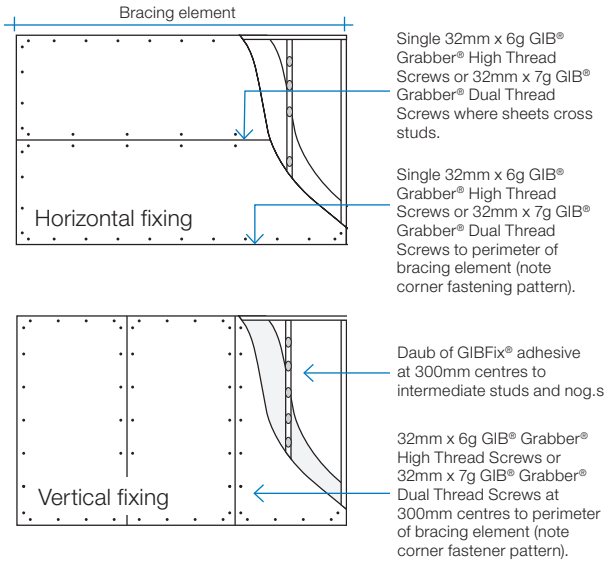
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

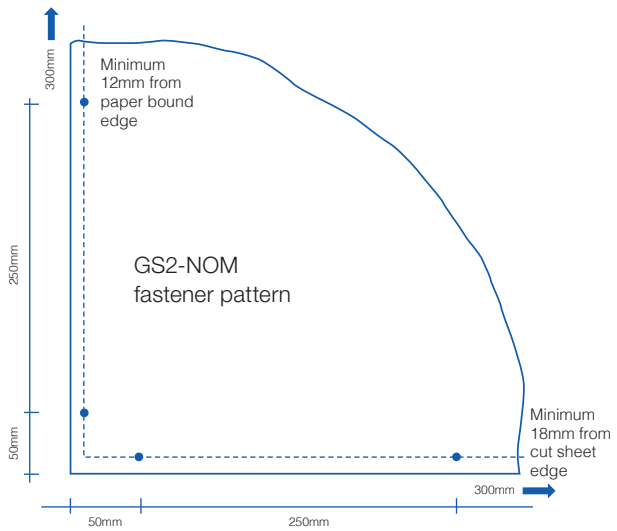
Fastener centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

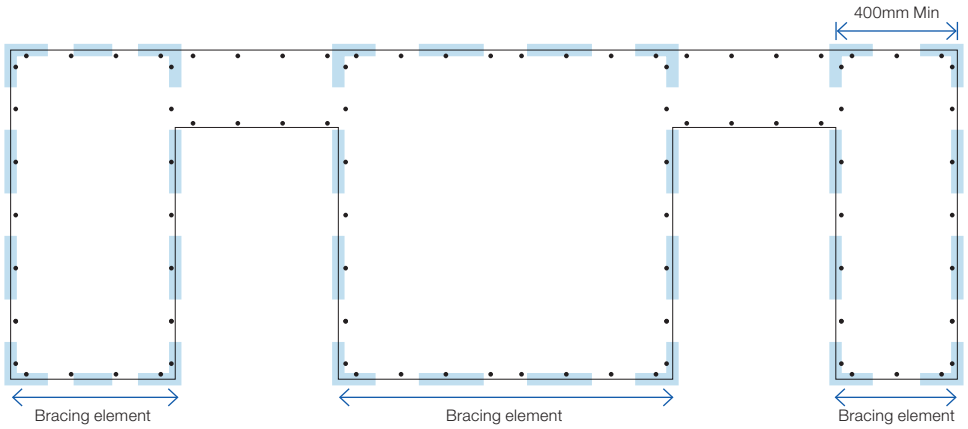
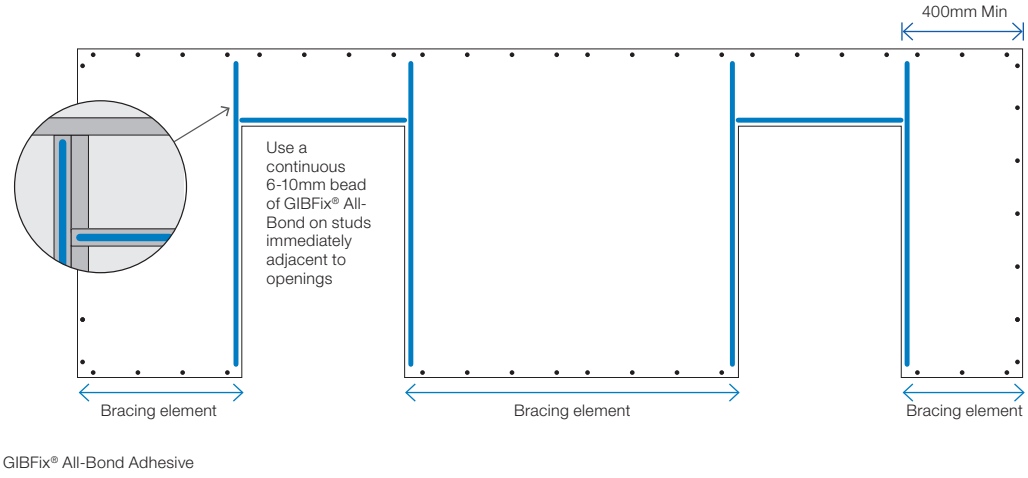
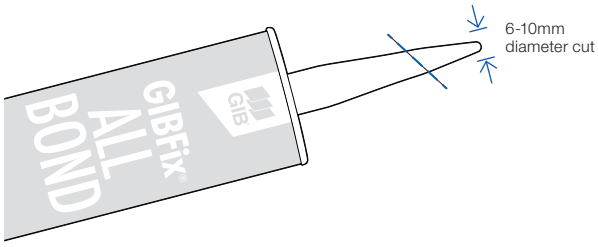


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

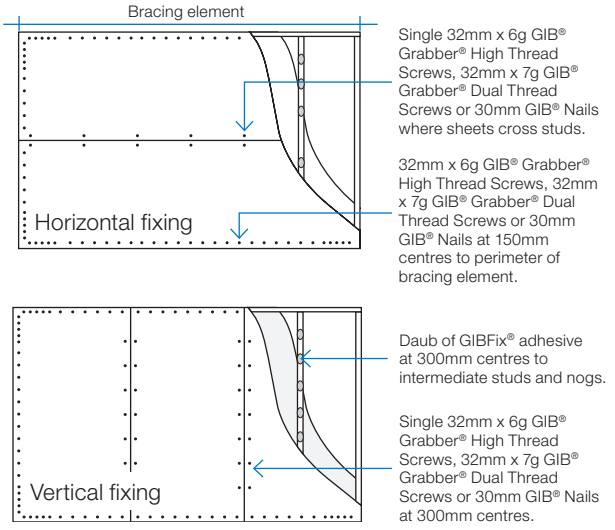
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

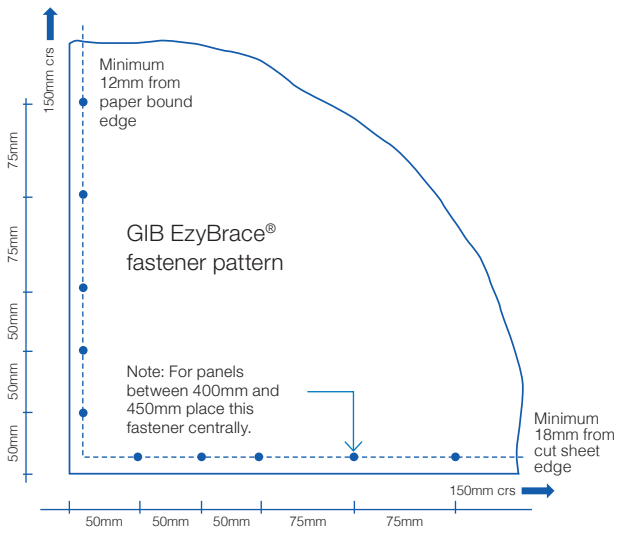
Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

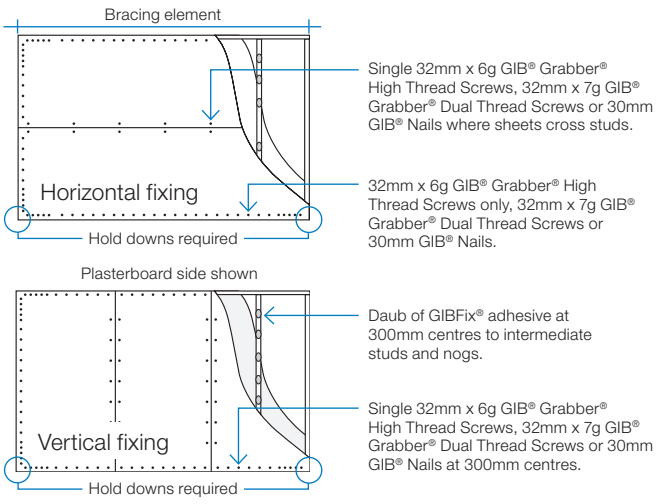
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

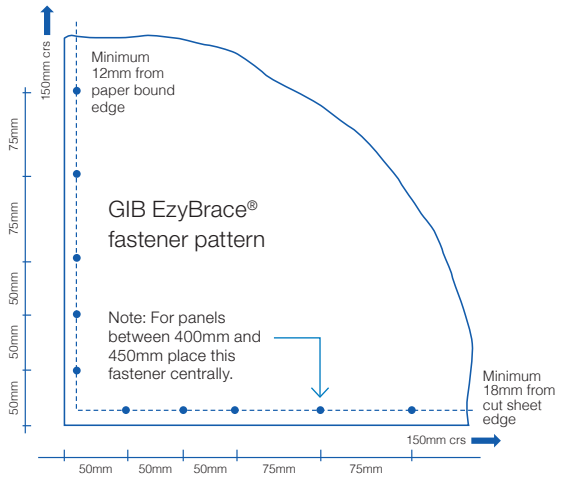
Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BL1-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline®
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

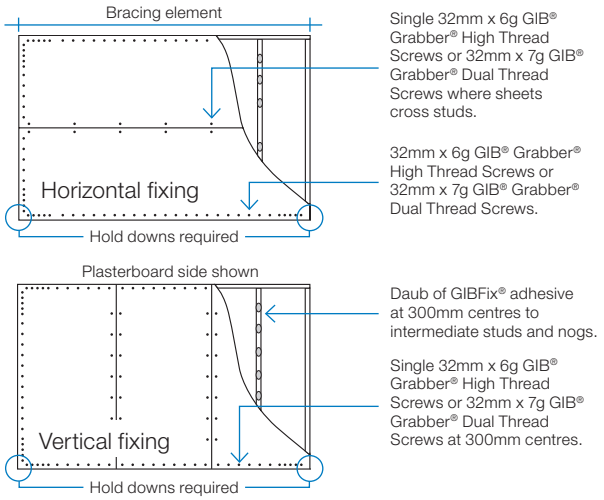
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

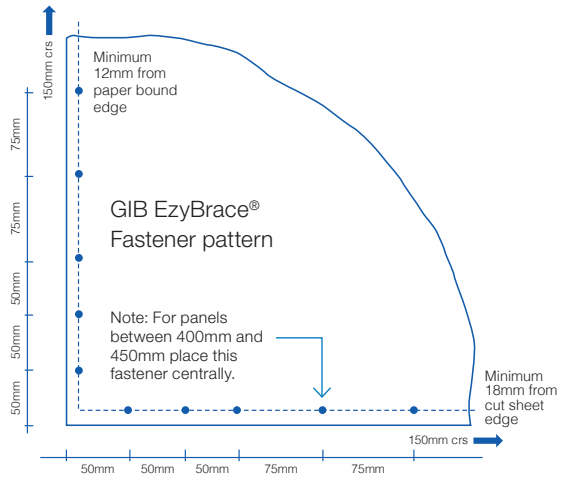
Fastener centres

50,100,150, 225, 300mm from maximum each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the sheet joint. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws.Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

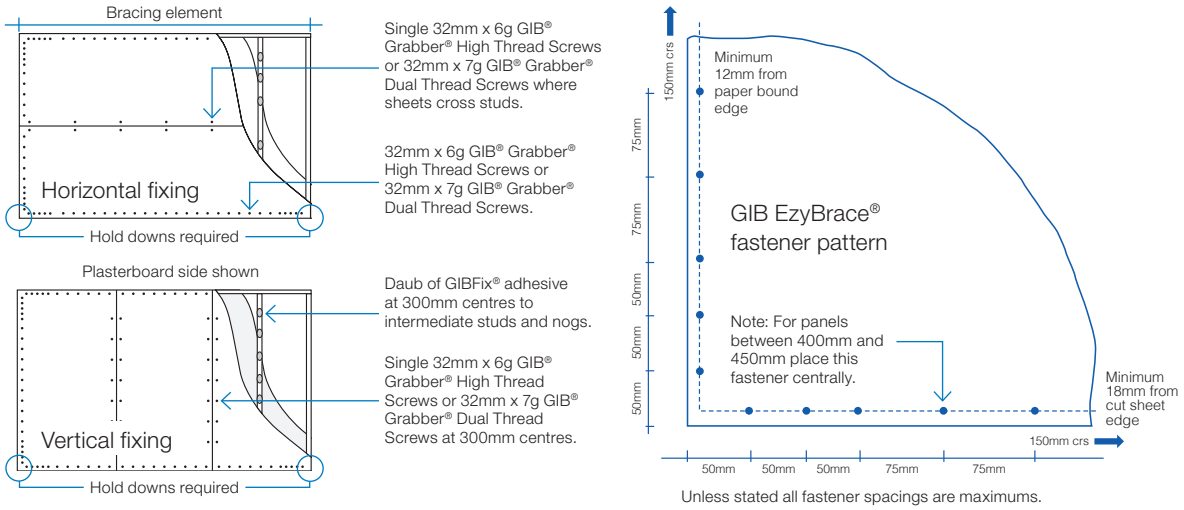
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure; B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

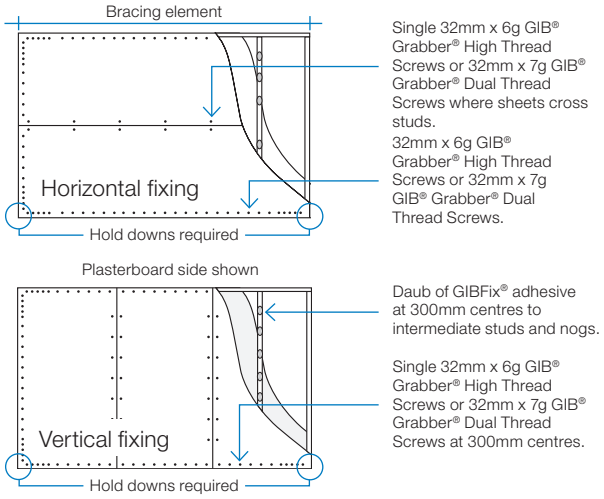
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

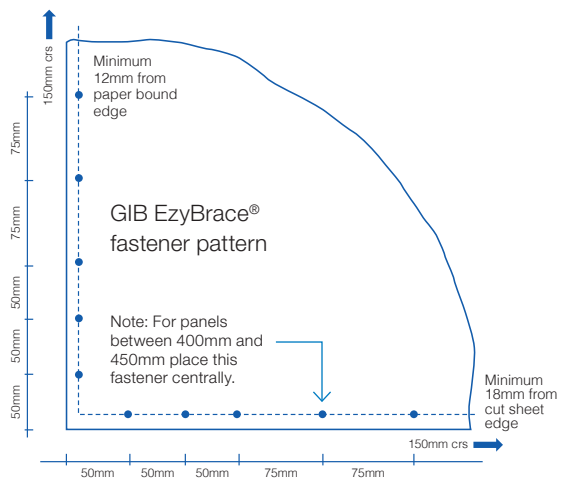
Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERTTM}

The Global GreenTag^{CertTM} certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag.^{CertTM}

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

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TRADEMARKS

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

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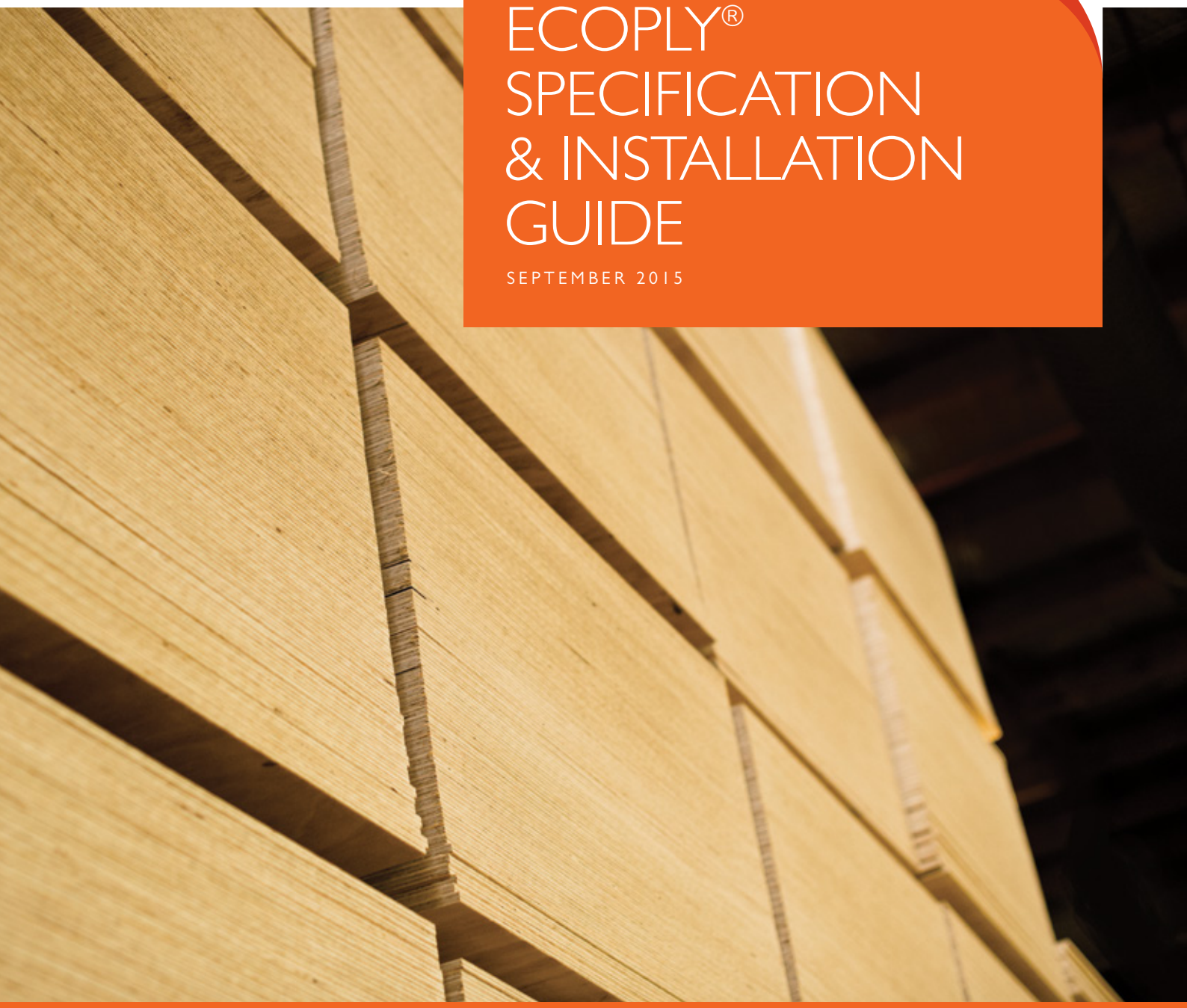
ecoply
Proven. Durable. Strong

ECOPLY® STRUCTURAL FLOORING
ECOPLY® STRUCTURAL ROOFING
ECOPLY® STRUCTURAL Square EDGE
ECOPLY® STRUCTURAL BARRIER

ECOPLY® SPECIFICATION & INSTALLATION GUIDE

SEPTEMBER 2015



CarterHoltHarvey Woodproducts New Zealand

Information contained within is specific to Ecoply® structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

ECOPLY® SPECIFICATION & INSTALLATION GUIDE

Contents

CarterHoltHarvey Woodproducts New Zealand

1.0 ECOPLY® PRODUCT RANGE

Manufactured in New Zealand by Carter Holt Harvey Woodproducts, the Ecoply® portfolio represents a range of structurally rated plywood products.

Ecoply is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural. All Ecoply products carry Engineered Wood Products Association of Australasia (EWPAA) Joint Accreditation System - Australia and New Zealand (JAS-ANZ) certification.

For information relating to Shadowclad® panels and plywood used as an exterior cladding, refer to the current Shadowclad Specification & Installation Guide for Cavity Construction. For information relating to Ecoply Barrier used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide. Both of these documents can be downloaded from www.chhwoodproducts.co.nz.

Ecoply products must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage. This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply products. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts assumes no legal liability to you in relation to this information.

1.1 TECHNICAL INFORMATION AND CAD DETAILS

When specifying or installing any Ecoply® plywood products visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

The information contained in this document is current as at September 2015. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Ecoply structural plywood products manufactured by Carter Holt Harvey Woodproducts and must not be used with any other plywood manufacturer's product no matter how similar they may appear.

Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply structural plywood products is not appropriate, and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the NZBC.

1.2 PRODUCT DESCRIPTION AND RANGE

Ecoply structural plywood panels are manufactured from radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

The strength of Ecoply plywood is optimised for maximum performance parallel to the face grain with cross plies providing enhanced stability across the grain.

The Ecoply plywood range can be specified for:

- Surface grade (e.g. CD) - where the first letter describes the face veneer appearance and the second letter describes the back veneer of the Ecoply sheet. Surface grades are defined in AS/NZS 2269 and summarised in Tables 2A & 2B
- Stress grade - utilises the symbol F and a suffix, for example;
  - F8 as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. F8 is the standard stress grade for Ecoply products
  - Ecoply 19 mm Longspan Flooring and 15 mm Ecoply Roofing are F11[1] stress grade (See Tables 1, 4 and 5). Other Ecoply products are also available in F11[1] upon request
- Thickness - ranging from 7 mm to 25 mm. (Thicknesses above 25 mm subject to availability)
- Length - being 2400 mm and 2700 mm with a standard nominal width of 1200 mm
- Preservative treatment - being untreated, H3.2 CCA or H3.1 LOSP Azole treated
- Edge finish - being square edge or for Ecoply Flooring and Roofing, routed on the long edges of the sheet with a polypropylene plastic tongue inserted into one side for a tongue-in-groove joint

For general installation advice refer to section 2.0: General Installation Guide.

For specification and installation advice for Ecoply used in typical applications refer to the following sections.

Typical Application	Section
Structural bracing and ceiling diaphragms	3.0
Roofs and decks	4.0
Flooring	5.0

Note: Technical notes referenced in this guide can be downloaded from www.chhwoodproducts.co.nz or contact Carter Holt Harvey Woodproducts on 0800 326 759.

Table 1: Ecoply® Product Range

Nominal Thickness (mm)		7		9		12		15		17		19		21		25	
Sheet length (x 1200 mm width)		2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700
Ecoply Structural Square Edge	BD			●		●	●	●		●							
	CD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD							●	●	●	●	● LS	● LS	●	●		●
Ecoply Roofing (pt)	DD							●	●	●	●						

- ● Available untreated only
- ● Available either untreated or H3.2 CCA
- ● Available either untreated or H3.1 LOSP

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200 mm cover

LS Ecoply 19 mm F11/F8 Longspan Flooring

- Full range may not always be available ex stock, check with your Ecoply supplier to ensure availability
- Non standard specifications, including thicker sheets may be available to special order in significant quantities
- All products are F8 stress grades
- Ecoply 15 mm/17 mm Roofing and Ecoply 19 mm Longspan Flooring are supplied as standard in F11 stress grade[1]
- Other Ecoply products are also available in F11[1] upon request

[1] Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

1.3 SURFACE GRADES

Table 2A summarises the surface appearance grades in which Ecoply structural plywood is available with some typical applications for each surface grade.

The surface grade specifications are defined in AS/NZS 2269. Table 2B details surface appearance grades for specialty Ecoply plywood and typical applications.

Table 2A: Ecoply® Structural Square Edge Products

Face Grade B	Face Grade C	Face Grade D
		
Appearance grade with a solid sanded surface. Suitable for a higher quality finish.	Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish.	Non appearance grade allowing open imperfections up to 75 mm across the face veneer. Splits and knots allowable
Possible Uses:	**Possible Uses:**	**Possible Uses:**
• Furniture/Joinery/Signs • Interior Linings • Sheathing • Engineering components where a superior visual finish is required	• Structural gussets • Stressed skin panels • Bins, boxes, crates • Hoardings • Membrane substrate	• Non visual bracing • Strength critical pallets • Structural components • Portal frame gussets

Table 2B: Speciality Ecoply® Products

Flooring CD	Roofing DD
	
Solid sanded C grade surface with tongue and groove profile on long edges. Features void free second layer under the face veneer for increased protection against high point loads	Unfilled D grade surface with tongue and groove profile on long edges
Possible Uses:	**Possible Uses:**
• Substrate for flooring overlays such as linoleum, tiles and rigid coverings • Substrate for membrane roofing and decking where visible appearance is critical	• Substrate for asphalt shingles • Substrate for roof systems where a smooth substrate is not required

Notes: A higher visual grade may be substituted if required. e.g. Ecoply CD can be used anywhere DD is used. Pictures shown above are scaled down versions of typical Ecoply sheets. Grain pattern and colour may vary. If sheet appearance is critical select panels individually.

1.4 PRESERVATIVE TREATMENT

Ecoply structural plywood is available untreated or treated in accordance with AS/NZS 1604.3. If treated, Ecoply structural plywood is treated with either H3.2 CCA (Copper Chrome Arsenate) or H3.1 LOSP (Azole) clear treatment. H3.1 LOSP is the standard preservative treatment for BD Structural Square Edge products and by special request for other Ecoply plywood products.

H3.2 CCA and H3.1 LOSP treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, subject to periodic moderate wetting and leaching."

Ecoply plywood is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Holdfast® Metalex® Concentrated Timber Preservative Clear (Holdfast® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

The characteristics of the treatments are shown in Table 3.

Table 3: Preservative Treatment

	Untreated	H3.2 CCA	H3.1 LOSP (Azole)
Preservative carrier	N/A	Water	Light organic oil (white spirits)
Colour	Natural	Green	Clear (i.e. natural)
Fungicide	Heat treated dry wood	Copper	Propiconazole and Tebuconazole
Insecticide	Heat treated dry wood	Arsenate	Permethrin
Other chemicals	N/A	Chrome (to fix preservative in wood)	Butyl Oxitol (co-solvent to assist active stability)
Mouldicide	N/A	Copper (limited efficacy)	IPBC
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Dried after treatment to average 18% moisture content for use in service at higher moisture contents	Solvent does not affect dimensions. Solvent smell disappears over time
Availability	Readily available	Standard treatment except for Ecoply BD	Treated to order for CD, DD, flooring and roofing products. Standard treatment for Ecoply BD
Applications (Refer NZ3602)	Interior dry protected	Exterior/Interior damp (service performance subject to detailing & coatings)	

H3.2 CCA

Ecoply structural plywood, which is H3.2 CCA treated (waterborne preservative with a green colour), is dried following treatment so that sheets may return to the correct dimensions. The moisture content after treatment with CCA and drying will be higher than the limits placed in AS/NZS 2269 on untreated product. The target is for an average moisture content of approximately 18% to provide a panel closer to the expected equilibrium moisture content for most H3.2 CCA applications.

The fillets used to separate sheets in drying may leave marks on the sheet surface. These will fade over time as the plywood weathers, and can be disguised with paint but may be visible under stain. The process of treating with H3.2 CCA and subsequent drying is likely to increase the face checking of the panel.

For more information on face checking refer to section 1.8 General Design Considerations - Aesthetics.

H3.1 LOSP

H3.1 LOSP treated Ecoply retains the wood colour and does not contain moisture so the plywood remains at the same dimensions and moisture content during treatment. However, the plywood when freshly treated may contain more than 60 litres of organic fluid per cubic metre. When coating H3.1 LOSP treated plywood, traces of residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

The H3.1 LOSP solvent smell can be quite strong and venting is recommended until most of the solvent has evaporated. Untreated plywood is recommended for internal applications where NZS 3602 allows the use of untreated plywood

Mechanical fasteners are recommended to fix H3.1 LOSP treated Ecoply to framing. If adhesives are required, thorough venting is recommended and H3.1 LOSP tolerant adhesives should be applied according to the adhesive manufacturer's instructions. See section 2.3 Adhesives.

1.5 SECTION PROPERTIES

Table 4A: Section Properties of Ecoply® Structural Plywood

		Section properties per mm width						
		Parallel to the face grain			Perpendicular to the face grain			
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Mass** (kg/m³)	**Parallel Moment of Inertia** (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)	**Perpendicular Moment of Inertia** I (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)
7	7-24-3	4.0	30.0	8.3	5.2	2.0	1.7	2.3
9	9-30-3	5.0	58.6	13.0	6.4	4.0	2.7	2.9
12	12-24-5	6.6	115.0	19.2	9.3	33.4	9.3	5.4
15	15-30-5	8.3	225.0	29.9	11.6	65.2	14.5	6.8
17	17-24-7	9.2	285.0	33.9	12.2	122.0	20.4	9.4
17	17-24-6	9.2	273.0	32.5	12.3	134.0	22.3	9.5
19	19-30-7	10.6	451.0	46.9	13.7	157.0	23.8	10.7
21	21-30-7	11.6	556.0	52.9	15.2	239.0	31.9	11.8
25	25-30-9	13.5	897.0	72.9	17.8	381.0	41.0	13.9

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F8 Grade

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F8)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1046.5	480.0	15.6	303.9	231.7	9.2
15	15-30-5	2047.5	747.5	19.5	593.3	362.5	11.4
17	17-24-7	2593.5	847.5	20.5	1110.2	510.0	15.9
17	17-24-6	2484.3	812.5	20.7	1219.4	557.5	16.0
19	19-30-7	4104.1	1172.5	23.0	1428.7	595.0	18.0
21	21-30-7	5059.6	1322.5	25.5	2174.9	797.5	19.8
25	25-30-9	8162.7	1822.5	29.9	3467.1	1025.0	23.4

Table 4C: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F11[1] Grade (Including Longspan Flooring)

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F11)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1207.5	595.2	16.7	303.9	231.7	9.2
15	15-30-5	2362.5	926.9	20.9	593.3	362.5	11.4
17	17-24-7	2992.5	1050.9	22.0	1110.2	510.0	15.9
17	17-24-6	2866.5	1007.5	22.1	1219.4	557.5	16.0
19	19-30-7	4735.5	1453.9	24.7	1428.7	595.0	18.0
21	21-30-7	5838.0	1639.9	27.4	2174.9	797.5	19.8
25	25-30-9	9418.5	2259.9	32.0	3467.1	1025.0	23.4

1 Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

2 Actual thickness of Ecoply sheets manufactured to thickness tolerances stated in AS/NZS 2269

3 Identification code: panel thickness – outermost veneer thickness x 10 – number of plies

4 I/Q values for rolling shear are for stress at the neutral axis calculated as in NZS 3603

Notes:

- Use Tables 4A & B values for all F8 stress grade Ecoply products
- Use Tables 4A & C values for all F11 stress grade Ecoply (including 19 mm Ecoply Longspan Flooring)
- The section properties in Tables 4A, B & C have been calculated in accordance with AS/NZS 2269
- For section properties for other thicknesses and Shadowclad® products contact CHH Woodproducts on 0800 326 759

Structural properties of Ecoply® plywood

The majority of Ecoply plywood is F8 grade (exceptions are identified in section 1.2: Product Description & Range) and the characteristic values may be used in conjunction with both NZS 3603 and AS 1720 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Tables 4B and 4C.

Table 5: Structural Properties of Ecoply® Plywood

	Characteristic Strength MPa	
Stress Grade	**F8**	**F11**
Bending (f_{pb})	25.0	31.0
Tension (f_{pt})	15.0	18.0
Panel shear (f_{ps})	4.2	4.5
Rolling shear (f_{pr})	1.7	1.8
Compression in plane of sheet (f_{pc})	20.0	22.0
Compression normal to the plane of the sheet (f_{pp})	9.7	12.0
Modulus of elasticity (E)	9100	10500
Modulus of rigidity (G)	455	525

Source: AS/NZS 2269

Wood is strongest when stressed parallel to the grain and weakest across the grain, so the lay up or arrangement of veneers in the panel determines the properties. Because of its cross banded construction, plywood possesses significant strength and stiffness both parallel and perpendicular to the direction of the face grain, but is generally strongest and stiffest along the direction of the face grain.

The section properties of structural plywood in Table 4A are calculated in accordance with AS/NZS 2269 to allow for the reduced contribution of veneers perpendicular to the direction of stress. For engineering design to NZS 3603, the section properties are multiplied by stresses and 'k' and ø factors to determine resistances for limit states design.

Resistances and nominal strengths in Tables 4B and 4C assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ø and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Table 5A: Strength Reduction Factors

Structural Timber Material	**Application of Structural Member**		
	Category 1	**Category 2**	**Category 3**
	Structural members for houses for which failure would be unlikely to affect an area[1] greater than 25 m²; OR secondary members in structures other than houses	Primary structural members in structures other than houses; OR elements in houses for which failure would be likely to affect an area[1] greater than 25 m²	Primary structural members in structures intended to fulfil essential services or post disaster function
	Value of Strength Reduction Factor Ø		
Structural Plywood – AS/NZS 2269.0	0.95	0.85	0.75

[1] In this context area should be taken as plan area.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name: e.g. ECOPLY
- Face grade, back grade: e.g. CD
- Intended application: e.g. STRUCTURAL
- Panel construction code: e.g. 19-30-7 (Thickness (mm)-Face veneer thickness (mm x 10)-Number of veneers)
- Glue bond: eg. A BOND
- Formaldehyde emission class: E0 for A Bond Ecoply
- Australasian Standard: e.g. AS/NZS 2269
- Treatment Standard (if applicable): eg. AS/NZS 1604.3:2012
- Date and time of manufacture: e.g. 01/12/15 12:23:45
- Stress grade: e.g. F8 (exceptions include Shadowclad® and Grooved Lining which are performance rated)
- The Engineered Wood Products Association of Australasia (EWPAA) brand and mill number: e.g. 911 (Tokoroa mill)

Untreated example:

ECOPLY CD FLOORING STRUCTURAL
19-30-7 A BOND E0 AS/NZS 2269.0:2012
PAT 01/12/15 12:23:45 F11/F8
911

Treated example:

ECOPLY CD STRUCTURAL
25-30-9 A BOND E0 AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA
RETREAT CUTS PAT 01/12/15 12:23:45 F8/F8
911

Note: Performance based products like Grooved Lining and Shadowclad may include brand identification instead of visual quality, stress grade, and panel code. These panels, when accompanied with specification literature, are still deemed to comply with AS/NZS 2269

1.7 CODE COMPLIANCE

Ecoply plywood manufacture is third-party audited through the product quality control programme of the Engineered Wood Products Association of Australasia (EWPAA) which is itself audited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

CHH Woodproducts is licensed by the EWPAA to stamp plywood with the EWPAA/JAS-ANZ Product Certification Mark. This certifies it has been manufactured under the third party audited Joint Product Certification programme to monitor compliance with joint Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural. Plywood to this standard is referenced in the NZBC Acceptable Solutions and Verification Methods through:

- NZS 3602 The Use of Timber and Wood-based products for Use in Building
- NZS 3603 Timber Structures
- NZS 3604 Timber Framed Buildings
- AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood
- E2/AS1 External Moisture

WARNING: Plywood which is non-certified or is manufactured to standards other than AS/NZS 2269, such as US voluntary standard PS1-95, is not referenced in the NZBC. There can be significant differences between AS/NZS 2269 certified and non certified plywood around bond durability, structural ratings and veneer quality.

Structure B1

Design to NZS 3603 Timber Structures complies with the NZBC in Verification Method B1/VM1 Clause 6.0 Timber. Plywood is the only sheet material with properties listed in NZS 3603. Ecoply structural plywood is available in F8 stress grade. Some specialty products are available F11 or with specifically designed properties for specialised applications.

1.8 GENERAL DESIGN CONSIDERATIONS

Durability (Clause B2) and exterior moisture (Clause E2)

Ecoply plywood is made from softwood solid radiata pine veneer. Designers should assess the level of exposure to biological, moisture, and other hazards and apply appropriate preservative treatment and detailing to minimise exposure to these hazards.

Information in this manual outlines suggested practices for detailing building components to exclude moisture to comply with the durability requirements of the NZBC.

Formaldehyde

Ecoply plywood is manufactured using phenol formaldehyde resins which are fully cured in the hot press. Cured resin is thermally and moisture stable and formaldehyde emissions for the glued plywood are similar to background levels for the wood by itself when tested to AS/NZS 2098.11 Determination of formaldehyde emissions for plywood. Accordingly every panel is branded with the lowest emission class (less than 0.5 mg/litre for E_0).

Actual formaldehyde emissions for Ecoply plywood have been tested and approved as having an actual formaldehyde emission level of less than 0.3 mg/ litre (equivalent to a Super E_0 emission level).

Moisture content and dimensional change

At the time of leaving the factory, the moisture content of untreated Ecoply plywood should generally be in the range of 8% to 15% as required by AS/NZS 2269. All wood products including plywood respond to changes in ambient humidity so the eventual moisture content of plywood varies according to how dry or how wet the environment is. After manufacture, the moisture content will move to equilibrium with the environment, and the veneers swell or shrink across the grain in response. The total expansion both along and across a 2400 x 1200 mm panel can be in the order of 1.5 mm to 3 mm as the plywood changes from a dry to a saturated state.

Ecoply that is treated with waterborne preservatives (e.g. H3.2 CCA) is expected to be used in applications that have higher humidity than interior dry use, so following treatment it is dried to a higher average moisture content of approximately 18%. This provides for a more stable panel in service than placing a dry (less than 15%) sheet in a higher moisture environment.

Detailing and construction must allow for movement if the plywood will be subject to cycles of moisture change. Seasonal and daily cycles can be significant depending on the end use.

Temperature

Wood will expand upon heating as do practically all solids. The thermal expansion of plywood is quite small and there is little effect on the structural performance or durability of plywood when used in temperatures below 54°C. The average co-efficient of thermal expansion of plywood is 4.5 x 10-6 mm/mm/°C. At temperatures above 55°C wood begins to deteriorate. Colours of coatings and finishes should be selected to reduce heat gain. For extreme conditions, further technical information is available by calling CHH Woodproducts on 0800 326 759.

The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 Methods of determining the total thermal resistance of parts of buildings. e.g. Plywood has a Conductivity (k) of 0.13 W/mK so a 12 mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Aesthetics

Ecoply plywood products can be selected for decorative or weather protection functions as well as structural performance. Acceptable Solution E2/AS1- External Moisture allows plywood manufactured to AS/NZS 2269, (minimum CD appearance grade, minimum 12 mm thickness and treated as required by NZS 3602) to be used for exterior cladding. For exterior cladding applications CHH Woodproducts strongly recommends Shadowclad® exterior cladding rather than smooth faced plywood such as Ecoply.

Shadowclad® features a textured (bandsawn) face which reduces the visibility of face checking and other appearance related issues which can occur on smooth faced plywood if not regularly maintained by the homeowner. For more information on plywood used as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction.

Face checks on plywood exposed to weather

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. If you are the specifier, it is important to discuss these issues with your client and consider the length of exterior exposure, climate conditions and protection offered by the surface coating before finalising product choice.

Durability

The durability of Ecoply structural plywood will depend on the application. Detailing, treatment and installation details need careful consideration to satisfy the requirements of the NZBC.

Normally, 50 year durability can be achieved with untreated Ecoply in dry, interior exposure. For internal environments subject to high humidity or condensation H3.2 CCA treated Ecoply should be used.

For plywood as a rigid air barrier (including rigid air barrier acting as bracing) refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhwoodproducts.co.nz.

Fire, spread of flame and smoke development

The following data on early fire hazard properties of uncoated Ecoply plywood are the result of tests carried out by Australian Wool Testing Authority AWTA to test structural plywood manufactured to AS/NZS 2269 in accordance with ISO 5660, reaction to fire tests (heat release, smoke production and mass loss rate). Part 1: Heat Release rate (cone calorimeter method).

Table 6 summarises the test configurations and associated material groups.

For plywood with decorative finish coatings or intumescent coating, performances depend on spread rates of the coating. For advice on specific coating systems and their suitability for use with Ecoply products, always refer to the coating manufacturer.

Table 6: Early Fire Hazard Properties of Ecoply® Plywood

Material	Species	Origin	Thickness	Treatment	Material groups
Plywood	Radiata Pine	New Zealand	7mm	CCA Treated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	CCA Treated	Group 3

1.9 SUSTAINABILITY

Ecoply is manufactured from radiata pine. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Ecoply is manufactured in New Zealand at CHH Woodproducts Tokoroa plywood mill.

Ecoply is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

1.10 HEALTH & SAFETY

Ecoply should be handled in accordance with the Material Safety Data Sheets (MSDS) for untreated, H3.2 CCA and H3.1 LOSP treated Ecoply, which can be downloaded from www.chhwoodproducts.co.nz.

Always wear safety glasses or non-fogging goggles when machining Ecoply panels.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn.

Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

1.11 STORAGE & HANDLING

Ecoply panels must be stored and handled with care to maintain good condition before use and after installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity
- Support for the sheets must be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in sheets)
- The stack must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage
- The sheets must be stacked flat, NOT on edge
- Store in well-ventilated areas away from sources of heat, flame or spark
- To avoid staining, fading and surface checking, the sheets must not be exposed to the weather while awaiting installation
- Store in well-ventilated areas away from sources of heat, flames or sparks

2.0 GENERAL INSTALLATION GUIDE

The following is a general guide to be followed unless otherwise specified. For additional installation instructions for typical applications refer to sections 3, 4 and 5.

2.1 FRAMING

Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. All timber frame sizes and set out must comply with NZS 3604 (or be specifically designed to NZS 3603). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz. Ecoply may be specified for frame spacing determined by design, or using tables in section 3 for specific product applications such as bracing, flooring and as a substrate for shingle roofs or membrane roofs and decks.

H3.1 LOSP treated framing should be vented before fixing and if construction adhesives are required (for example to screw and glue floor panels) the adhesive must be compatible with H3.1 LOSP. See section 1.4: Preservative Treatment.

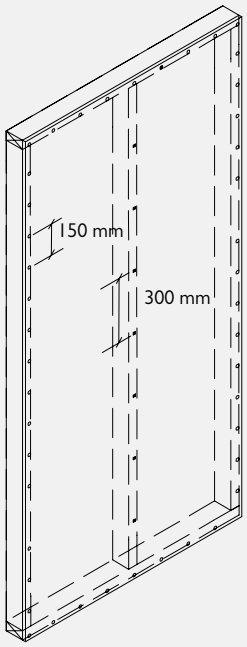
For plywood used as exterior cladding refer to the current Shadowclad® Specification & Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide which can be downloaded from www.chhwoodproducts.co.nz

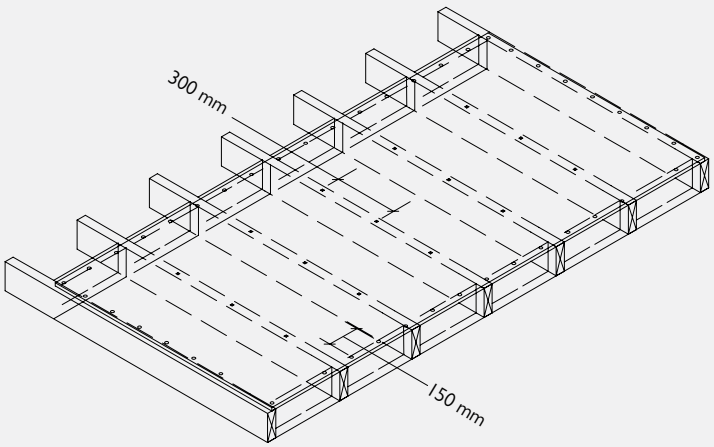
2.2 SHEET FASTENERS AND FIXING

- Where there is risk of panel size change due to changes in moisture levels, allow a 2 to 3 mm expansion gap between sheets
- Use only flathead nails or screws, with or without construction adhesives
- Fastener length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is the greater. Longer or ring shank nails may be specified
- Fasteners must be at least 3 fastener diameters or 7 mm from the edge of the sheet
- For tongue and groove products such as flooring and roofing fasten 15 mm from tongue and groove edges
- Standard fixing pattern: unless otherwise specified fasten edges and ends of sheets at 150 mm centres, and within the panel at no more than 300 mm centres (see diagram below)
- Use hot dipped galvanised fasteners or corrosion resistant fasteners (i.e. stainless steel) determined by design for specific hazards
- Where using stainless steel nails, nails must be annular grooved
- Refer to Table 7 for minimum fastener sizes
- Do not overdrive power driven nails

EC001: Fastener spacings for Ecoply®



Ecoply® fastened in vertical plane



Ecoply® fastened in horizontal plane

EC002: Fastener spacings from edges

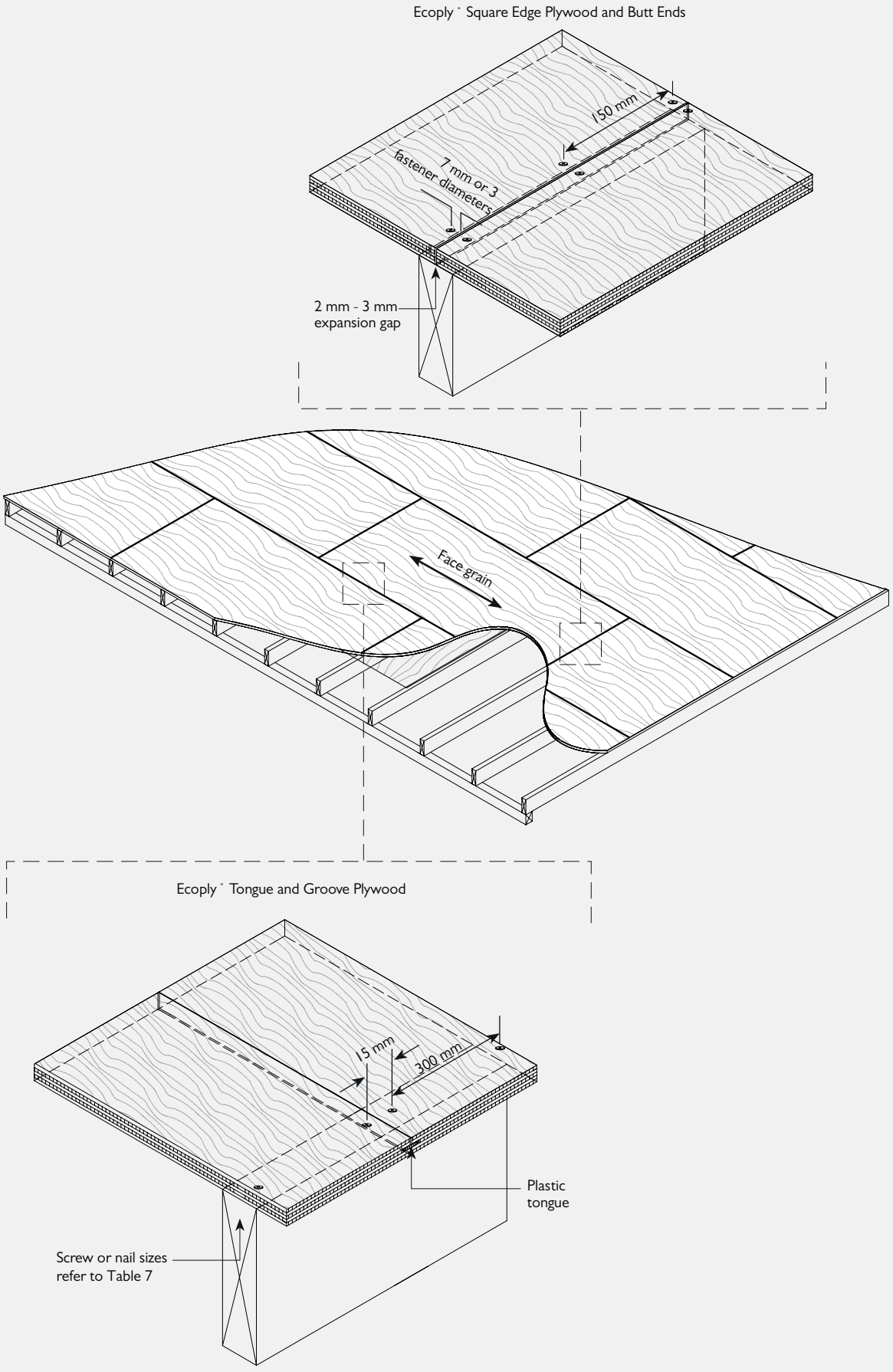


Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm / 9mm	Load[1]	12mm / 15 mm	Load[1]	17 mm	Load[1]	19mm / 21mm	Load[1]	25 mm	Load[1]
Minimum nail size in timber framing[2]	40 x 2.5 mm	570	60 x 2.8 mm	736	60 x 2.8 mm	736	60 x 2.8 mm	736	75 x 3.15 mm	883
Screw size in timber framing[2]	8g x 30 mm	1230	8g x 40 mm	1230	10g x 40 mm	1650	10g x 45 mm	1650	10g x 50 mm	1650
1.15 mm steel framing[3]	10-24-35[4]	1300	10-24-40[4]	2000	10-16-45[4]	2100	10-16-45[4]	2100	10-16-45[4]	2100
Screw size in 2.80 mm steel framing[3]	10-24-35[4]	1200	10-16-404	1200	14-20-45[4]	3000	14-20-45[4]	4000	14-20-45[4]	5000

1 The load is the characteristic load (N) for one fastener in single shear

2 Characteristic load based on fixing into a timber of J5 joint group or better

3 Self tapping, self countersinking screw

4 Screw Numbers indicate: Gauge – Threads per inch – Length (mm)

Notes

- Steel thickness, screw sizes, characteristic loads, refer to assemblies actually tested
- Other screw sizes may be used. Screw properties vary between screw suppliers and the suitability of a particular size should be verified by the designer for performance under changing physical conditions and cyclic loading
- Non-standard nailing may be specifically designed with NZS 3603 or similar

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Notes

H3.2 CCA treated timber should not be fixed in direct contact with light gauge steel products. Refer to the framing manufacturer for advise on fixing and treatments.

2.3 ADHESIVES

Tube applied construction adhesives

Site applied construction adhesives may be used together with nails and screws for non permanent loads, reduced fastener popping, and to lower the risk of squeaking in floors. Available types include polyurethane (e.g. Holdfast® Gorilla Nailpower®) and elastomeric (e.g. Bostik® Wallboard Gold) based adhesives.

Elastomeric adhesives should meet the requirements of APA Performance specification AFG 01 Adhesives for field gluing plywood to wood framing. Other types should have appraisal from an independent authorising body such as BRANZ or equivalent authorities for the specific applications proposed. Follow manufacturer's recommendations. In addition:

- Use a bead or daubs of adhesive as per manufacturer's recommendations
- Apply pressure using fastener patterns outlined in section 2.2: Sheet Fasteners and Fixing
- Work from the middle of the sheet outwards to develop glueline pressure
- Ensure adhesives are compatible with treatment in the framing timber, see section 1.4: Preservative Treatment

Structural adhesive joints

Structural bonds are generally only achievable in factory controlled conditions using approved structural adhesives in accordance with approved standards for glue lamination, e.g. Resorcinol formaldehyde joints made to AS/NZS 1328 Glued laminated structural timber. Site gluing is not recommended for structural plywood components. Contact CHH Woodproducts on 0800 326 759 for further information.

3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZBC - B1 Structure, and NZS 3604 *Timber Framed Buildings* or specifically designed to NZS 3603 *Timber Structures Standard.*

Any Ecoply structural panel may be used for bracing as long as it is 7 mm, 9 mm or 12 mm thick, has a minimum wall length as described in Table 9, treated for the specific application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this guide.

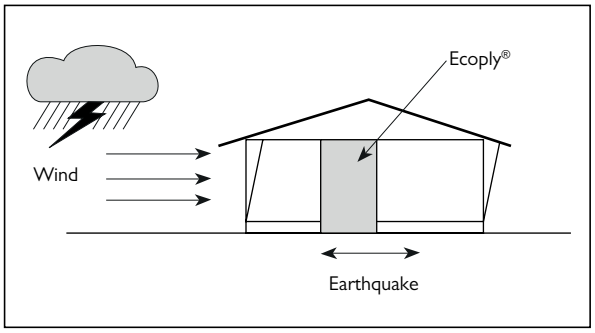
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Specific design



Ecoply structural plywood is manufactured to AS/NZS 2269, and it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Demand is calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz

EP bracing systems properties can be easily loaded into the EzyBrace software by way of an Excel patch downloadable from www.chhwoodproducts.co.nz together with loading instructions.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120 BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120 BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120 BUs/m.

Durability

Ecoply plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability Clauses of the NZBC.

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the required preservative treatment and fastener material.

Table 8: Ecoply® Suitability for Bracing Applicatons Including Treatment Type & Fastener Material

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray): E.g. Interior linings	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/ without building paper/ wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply® Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones[1] D	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones, as per section 4 of NZS 3604 (including sea spray)	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

Note: Power driven nails are suitable for use. Do not overdrive, nails must be full round head

Rain wetting and construction bracing

Untreated Ecoply will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and condensation

In conditions where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3.1 LOSP or H3.2 CCA treated to resist decay or insect hazard.

Subfloor sheet bracing

H3.2 CCA treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, 100% acrylic exterior coating system with a light reflectance value of 50% or greater.

Adjustments for wall height

Use section 5 of NZS 3604 to calculate bracing values: "Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4 m, the bracing rating determined by test or from Table 9 should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4 m high shall be rated as if they are 2.4 m high.
(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
(c) Walls with heights < 1.5m, Specific Engineering Design is required.

Joining panels for walls higher than maximum sheet length

Ecoply bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.4 m, Ecoply and Shadowclad® is available in 2.7 m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications (e.g. 2.4 m x 1.2 m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7 m x 1.2 m bracing element).

Cladding as bracing

12 mm Ecoply (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weathertight cladding and bracing element when installed in accordance with E2/AS1.

It should be noted smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Woodproducts to be a manufacturing or product fault. For more information refer to section 1.8: General Design Considerations - Face Checks on Plywood Exposed to Weather. H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

Plywood for exterior cladding applications where a high visual appearance is desired, CHH Woodproducts recommends the use of Shadowclad as an exterior cladding. Shadowclad has a textured (bandsawn) face which reduces the visibility of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100 mm above decks or paved ground and a minimum of 175 mm above unprotected ground.

Service penetrations in bracing elements

Small openings (e.g. power outlets) of 90 x 90 mm or less may be placed no closer than 90 mm to the edge of the braced element, or waste pipe outlets of max. 150 mm diameter placed at no closer than 150 mm to the edge of the braced element.

3.2 ECOPLY® BRACING SPECIFICATIONS SUMMARY

CHH Woodproducts has a range of bracing specifications called the EP bracing series. The EP bracing series simplifies the design and construction of bracing elements using plywood, by itself or in conjunction with GIB® Plasterboard and features:

- Single sided and double sided bracing elements High performance bracing element utilising GIB® Standard plasterboard
- A single type, GIB Handibrac®, hold-down for all bracing elements
- Specifications for each bracing element type

Table 9: Summary P21 Ratings for 2.4m High Ecoply® Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.4 m	Ecoply one side	80	95
	0.6 m		95	105
	1.2 m		120	135
EPG	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
	1.2 m		150	150

Note: Bracing and other technical information has been specifically tested using Ecoply branded structural plywood. This information cannot be used with any other plywood brand and bracing data must be sought directly from the specific plywood manufacturer.

More information

The following pages provide a full specification of EP bracing elements. Copies of specifications can be downloaded from www.chhwoodproducts.co.nz

NZS 3604 provides the method of calculating demand on a building. Calculation sheets are available from BRANZ or GIB EzyBrace® software is available as a free download from www.gib.co.nz. Information is available at www.chhwoodproducts.co.nz which can be placed in the custom elements of GIB EzyBrace® for ease of calculation

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.3 ECOPLY® BRACING SPECIFICATION - EPI

Table 10: Singled Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1_0.4	0.4 m	Ecoply one side	80	95
EP1_0.6	0.6 m	Ecoply one side	95	105
EP1_1.2	1.2 m	Ecoply one side	120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604)
- NZBC B2 - Durability: AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe® of SG8 stress grade minimum, is recommended.

Bottom plate fixing

Use GIB Handibrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

One layer of 7 mm, 9 mm or 12 mm Ecoply plywood fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening the Ecoply® panels

Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

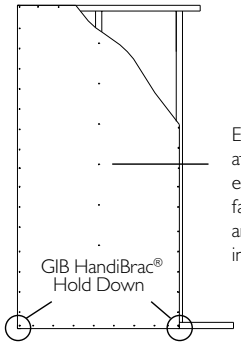
Fasteners for H3.2 CCA treated Ecoply® panels

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised.

In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Table 11: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.4 ECOPLY® BRACING SPECIFICATION – EPG

Table 12: Structural Plywood Brace with Plasterboard Other Side

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EPG_0.4	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
EPG_1.2	1.2 m		150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604)
- NZBC B2 - Durability: AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe® of SG8 stress grade minimum, is recommended.

Bottom plate fixing

Use GIB HandiBrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

Side 1: One layer of 7 mm, 9 mm or 12 mm Ecoply plywood exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Side 2: One layer of 10 or 13 mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® panels

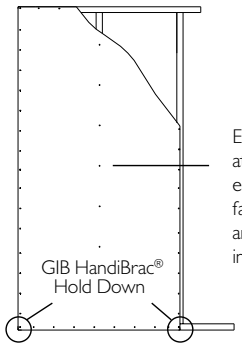
Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Fastening the GIB® Plasterboard

32 mm x 6 g GIB® Grabber® Screws or 35 mm GIB® Nails

Fastening centres

Fasten 50, 100, 150, 225 and 300 mm from each corner and 150 mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300 mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12 mm from paper bound edges and 18 mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.

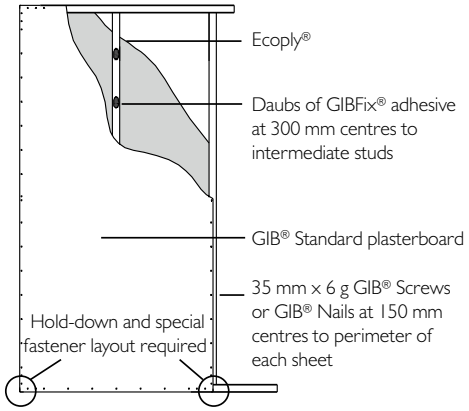


Table 13: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones including sea spray, as per section 4 of NZS3604):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones1 B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone1 D (sea spray), as per section 4 of NZS3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in eexposure zone D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

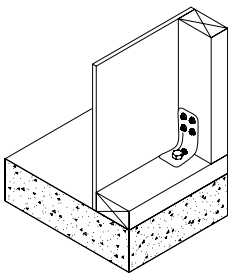
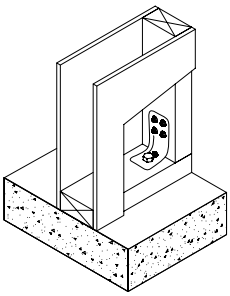
* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

3.5 GIB HANDIBRAC® – RECOMMENDED INSTALLATION METHOD

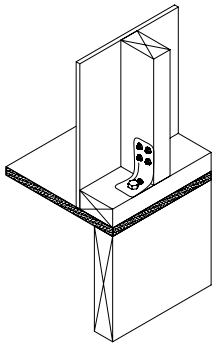
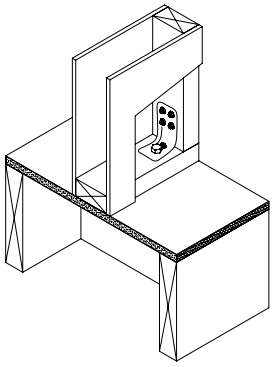
Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as the hold-down in all EP bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings

Concrete Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate	Position GIB HandiBrac® at the stud/plate junction
Hold-down fastener requirements	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket	

Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block
Hold-down fastener requirements	
M12 x 150 mm galvanised coach screw	

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3.6 STRUCTURAL CEILING DIAPHRAGMS

Diaphragms are used to transfer lateral loads to braced walls and allow for greater spacing between bracing lines. Diaphragms do not have a BU rating themselves.

Plywood diaphragms are an acceptable solution as described in section 13 of NZS 3604 13.5.2 which allows for plywood not less than 6 mm thick and a minimum of three ply for:

(a) Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
(b) Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs

Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

(a) The length of diaphragm shall not exceed twice its width measured between supporting walls
(b) The ceiling lining must consist of plywood over the entire area of the diaphragm
(c) Complete sheets with a minimum size of 1800 x 900 must be used
(d) Framing size and spacing must comply with NZS 3604
(e) Fastener size should comply with Table 7 of this guide. E.g. 40 mm x 2.5 mm flat head nails for 7 mm and 9 mm Ecoply
(f) Fastening is at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing
(g) Fixings are no closer than 10 mm from sheet edges
(h) Perimeter ceiling framing must be connected to wall framing by a perimeter 140 mm x 35 mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55 mm thick steel angle or proprietary steel channel
(i) Sheets must be layed in a staggered pattern
(j) The basic shape of a ceiling diaphragm should be rectangular. Protrusions are permitted but cut-outs are not (see Figure 13.4 NZS 3604)

4.0 ROOFS AND DECKS

The section below covers the use of Ecoply plywood used as a substrate for flexible membrane and tile systems in roofing and decking applications. The information below should be considered as supplementary to system specifications from roofing and decking suppliers.

Further guidance on installation and detailing factors can be found in the EWPAA Technical Note; Plywood Roofing and Flooring: Installation and Detailing Factors. This can be downloaded from www.ewp.asn.au

Ecoply is not recommended as a substrate for exterior decks without a properly detailed barrier material such as butyl rubber, vinyl or E.P.D.M to protect the surface from weathering.

Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products.

4.1 FLEXIBLE MEMBRANE SYSTEMS

- Roofing and decking membranes may comprise synthetic rubber sheeting glued to the Ecoply, or torch welded bitumen membranes
- Always ensure Ecoply is dry and free of imperfections such as surface dust and blemishes as membranes coatings will telegraph any substrate imperfections
- Use Ecoply Flooring or Structural Square Edge (CD Grade)
- Where Ecoply Flooring is used consider the use of a small daub of glue or nail in the Tongue & Groove of each sheet if potential movement of the plastic tongue joint is not acceptable
- For trafficable decks use a minimum 17 mm thickness, refer to Table 15A and 15C for specification
- Use countersunk stainless steel screws and adhesive on framing to avoid head popping. Apply adhesive between screw locations
- Use kiln dried timber framing such as Laserframe® or appropriate LVL framing from the Futurebuild® range
- Consult the membrane manufacturer regarding use of bond breaker tapes over joints to allow elongation with natural plywood movement
- Where treatment is required use only H3.2 CCA treated Ecoply. Do not use H3.1 LOSP treated Ecoply (solvent based carrier). It is not compatible with most membrane systems. If there is evidence of treatment salt crystals on the Ecoply surface remove by scrubbing with a small amount of water and allow the surface to dry prior to laying the membrane system

Plywood substrates, face checking and flexible membrane systems

All natural wood based products (including Ecoply) have the potential to develop natural surface face checks when exposed to external environmental conditions. The degree of face checking is dependent on a number of factors including the length of time and level of exposure to weather during construction which is outside the manufacturing control of CHH Woodproducts. For more information see section 1.8: General Design Considerations - Face Checking on Plywood Exposed to Weather.

Face checks, while typically not present after manufacture, do not affect structural performance of the sheet and are acceptable under AS/ NZS 2269. They are not a manufacturing fault.

Designers and membrane suppliers must carefully consider the suitability of plywood as a substrate for the membrane system in question if the potential of telegraphing of face checks onto the membrane surface is not acceptable.

The risk of telegraphing can be reduced by protecting the plywood surface from weather and moisture during the construction process.

Where the potential of face checking in the plywood substrate is not acceptable designers should consult the membrane supplier for a more suitable membrane or an alternative substrate.

Allowing for moisture expansion of plywood under roof and floor coverings

Membrane suppliers have held different views on the requirements for plywood substrates. The fixing instructions within this guide are the starting point but designers must detail joints that allow for expansion in accordance with practices recommended by the chosen membrane supplier.

CHH Woodproducts' view, and the recommendation of a number of suppliers here and in North America is that expansion and contraction at sheet edges should be allowed for by loosely butting tongue and grooved edges so that the tongues can absorb movement and providing a small gap (2 to 3 mm) between square sawn edges. Use a bond breaking tape over these joints to spread elongation in the membrane over a longer distance than the narrow gap in the joint itself. This tape can double as a rain seal over the sheet edges during construction.

Other membrane suppliers believe that sheets should be tightly butted and glued and screwed hard up to each other. This practice constrains movement at the small joint between sheets, but over a wider area requires significant allowance for movement around the perimeter of a roof segment. Junctions between the roof slopes and walls need careful detailing to allow for the potential movement. Movement control joints should be provided at regular intervals following the recommendation of the membrane manufacturer, especially if this method is adopted.

4.2 ROOF TILE SYSTEMS

Most fibreglass, asphalt or wooden shingle and tile systems will tolerate DD grade surface characteristics.

- Use unsanded Ecoply Roofing (DD grade), or sanded Ecoply of the required thickness in Table 15A
- The unsanded surface provides extra grip on steeper roofs for roofers
- Fix tiles according to the tile manufacturer's specification
- Under asphalt shingles use felt underlay over the Ecoply

4.3 ROOFING & DECKING – PRODUCT SELECTION GUIDE

Table 14: Roofing and Decking Product Selection Guide

	Structural Square Edge (CD Grade)	Flooring (CD Grade)	Roofing (DD Grade)
Product Description	CD face grade sheets are available in a range of thicknesses and size	Solid sanded C grade surface with tongue and groove profile on long edges	Unfilled D grade surface with tongue and groove profile on long edges
Recommended Applications	Substrate for flexible coverings requiring a smooth substrate and where avoidance of visible surface indentations is critical. Use as a substrate for flexible roof and deck membranes and thin roofing tiles		Substrate for coverings with the ability to span holes in the D face grade (up to 75 mm in diameter) such as asphaltic roof tiles and torch welded polyester reinforce membranes. Do not use under flexible membrane coverings or where avoidance of visible surface indentation is critical
Face Grades	Front: C solid sanded Back: D unsanded		Front & Back: D unsanded
	Refer to Table 1 for range and treatment options		
Product Features	Blocking required to support all edges	Second void free layer under surface veneer for increased protection against punching through the first veneer under high point loads & increased moisture resistance. Blocking not required to support tongue and groove edges (unless otherwise specified)	15 and 17 mm thickness specifically designed for use under shingles and tiles that have a courser finish. Unsanded surface for extra strength and grip for installers on steep roofs Blocking not required to support[2] tongue and groove edges (unless otherwise specified)
Thicknesses Available	12, 15, 17, 19, 21, 25 mm	15, 17, 19, 21, 25 mm	15, 17 mm
Sheet Sizes Available	2400/2700 x 1200m		
Stress Grades Available	F8 (F11[1] available upon request)	F8 (F11[1] available upon request) 19 mm Longspan supplied F11[1] as standard	F11[1]
Treatment	Untreated, H3.2 CCA and H3.1 LOSP	Untreated, H3.2 CCA, (H3.1 LOSP available upon request)	
Span Capabilities	Refer to frame spacings in Tables 15A to 15C		

1 Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain.

2 Where roofing products use tongue and groove CHH Woodproducts recommends fastening the tongue to rafters/joists at a minimum of one point

4.4 FRAME SPACINGS FOR ECOPLY® ROOFS AND DECKS

Table 15A: Roofing - Sheathing, Non Trafficable, Above 2 Degree Pitch

Application	Roof Pitch	Stress Grade	Maximum Wind Zone	Maximum frame centres (mm) for Ecoply® with face grain across framing				
				Ecoply nominal thickness (mm)				
				15	17	19	21	25
Sheathing, non trafficable roof for all roof pitches above 2 degrees Suitable for roof mass up to 30 kg/m² (additional to Ecoply weight or 40 kg/m² including Ecoply)	>2°	F8	Extra High	600	600	800	800	900
		F11	High	900	900			
			Very High	800	900			
			Extra High	800	800			
	>20°	F11	Very High	900	900			
			Extra High	800	800			

Suggested applications include substrates for Asphalt Shingle and Membrane type roofs. The above suggested maximum framing spans are based on the following deflection criteria:

- Under a short term 1kN point load, deflection is less than Span/130
- Under a long term self weight load, deflection is less than Span/400
- Under a short term wind gust load, deflection is less than Span/150

Table 15B: Sub-Sheathing

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing					
	Ecoply nominal thickness (mm)					
	12	15	17	19	21	25
Under steel or self supporting cladding for support of building paper or lateral diaphragm action. Sag not critical.	800	1200				

Table 15C: Decking

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing			
	Ecoply nominal thickness (mm)			
	17	19	21	25
1. Trafficable roof decking Limited by dynamic response of roof as floor	540	600	600	750
2. Roof decking to Clause 8.5.5.1 c) of E2/AS1	400	400	400	400

- The current requirement in E2/AS1 is extremely conservative when compared with calculations determined for other applications using VM1 Clause 6 and calibrating the spans against codes of practice from North America and Australia. CHH Woodproducts recommends designers consider the alternative solution in row 1 of Table 15C for membrane decking in consultation with the membrane manufacturer.

  Unless otherwise stated spans apply equally to square edge or tongue and groove panels. Check Table 1 for availability of grades and lengths to match span multiples in Table 16
- Use the next lower recommended frame spacing or thicker Ecoply® where appearance is critical
- To suit trusses at 900 centres, 2700 long sheets are available. See Table 16

Table 16: Frame Set Outs to Match 2400mm and 2700mm Sheet Modules

Length (mm)	Typical Frame Spacing to Suit Sheet Length			
2400	400	480	600	800
2700	450	540	675	900

Limitation for the use of Table 16.

CHH Woodproducts does not have access to information about designs for specific sites. Table 16 is a guide to estimate the initial selection of a span for design. Each site should be evaluated by qualified persons to ensure all loading parameters and site conditions have been considered, and appropriate changes should be made by the building designer.

4.5 ROOFING – DESIGN CONSIDERATIONS

Durability

In general, H3.2 CCA treatment of Ecoply plywood with waterborne preservatives is recommended for roofing.

Roofing materials

Various roofing materials used over Ecoply plywood have different durability expectations, normally in excess of the 15 years required by the NZBC Clause B2. Durability of the roofing is subject to the specifications, installation and maintenance requirements of the roofing manufacturer. The durability of the Ecoply can only be assured as long as the overlying roofing and detailing excludes moisture. With good building practice and maintenance, roofing materials can be repaired or replaced at regular intervals to achieve life from the Ecoply in excess of the original roofing. The durability of Ecoply structural plywood will continue to satisfy the relevant requirements of the NZBC for 50 years, if installed in accordance with the instructions and limitations within this guide and the roof system is adequately maintained.

High humidity, condensation and solar driven moisture

Where the moisture content of wood may exceed 18% for prolonged periods, Ecoply must be H3.2 CCA treated, to resist decay hazard. This includes Ecoply used under roof coverings that may be subject to condensation, or where rain moisture soaked in the roof covering can be driven into the Ecoply by the sun. Appropriate building detailing and ventilation is recommended which can reduce the need for treatment.

Roof ventilation

Good ventilation and the avoidance of moisture are important design considerations when using H3.2 CCA treated Ecoply panels. Poorly ventilated spaces can develop very high temperature and moisture levels. The most likely source of moisture is the condensation of vapour from warm interior air on the underside of cold roofing. Good ventilation can limit the build up of excess moisture vapour in warmer climates but in regions where winter nights are consistently colder, H3.2 CCA treated Ecoply should be used. Moisture induced decay is only one risk that needs to be managed. If incorrectly detailed, roof spaces can be very tight and the dark colour of many roofing materials means that excessive heat can build up causing distortion in plywood or even framing members. Use the suggested details or alternatives to suit. Designers must consider roofing type, seasonal conditions, wind effects and the intended use of the building.

As a minimum, CHH Woodproducts recommends a vent area of 1/300th of the ceiling plan area (approx 3350 mm^2 per square metre of ceiling) equally distributed at the eaves and ridge to allow free flow under the Ecoply, up the roof slope, and out.

Roofing material suppliers should detail vent systems suited to their specific membrane or tile roofing. Proprietary ridge capping profiles or vents are available from roofing suppliers.

Detail gaps of 25 mm in the plywood at ridges, and at walls where a roof slopes up to an upper storey. For flat roofs, natural ventilation flows may be impeded. Use proprietary roof vents. Consider forced ventilation as appropriate.

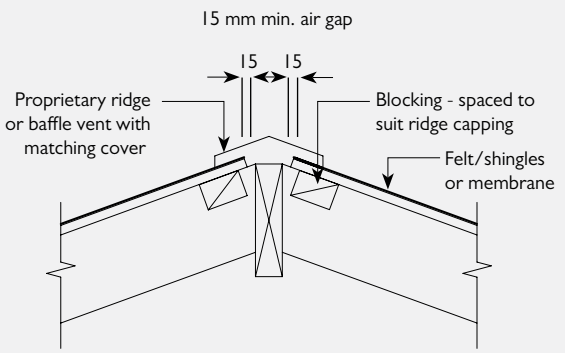
Bubbling

Plywood bubbling occurs when moisture trapped in knot holes in inner veneers expands as the temperature rises. This moisture will dissipate through the face veneer and will not affect the structural integrity of the plywood panel. As membrane coverings can prevent moisture dissipation, Ecoply Flooring and Structural Square Edge CD is recommended if the visual appearance of bubbling is not acceptable, or a high visual finish is required.

Soil

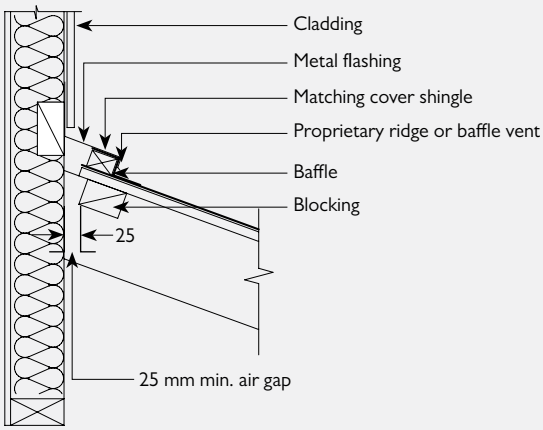
Ecoply plywood (untreated or H3.1 LOSP/H3.2 CCA treated) must not be allowed to come in contact with soil. Surfaces, flashings and gutters should be detailed to avoid trapping detritus and moisture.

EC003: Ridge detail with ridgeboard

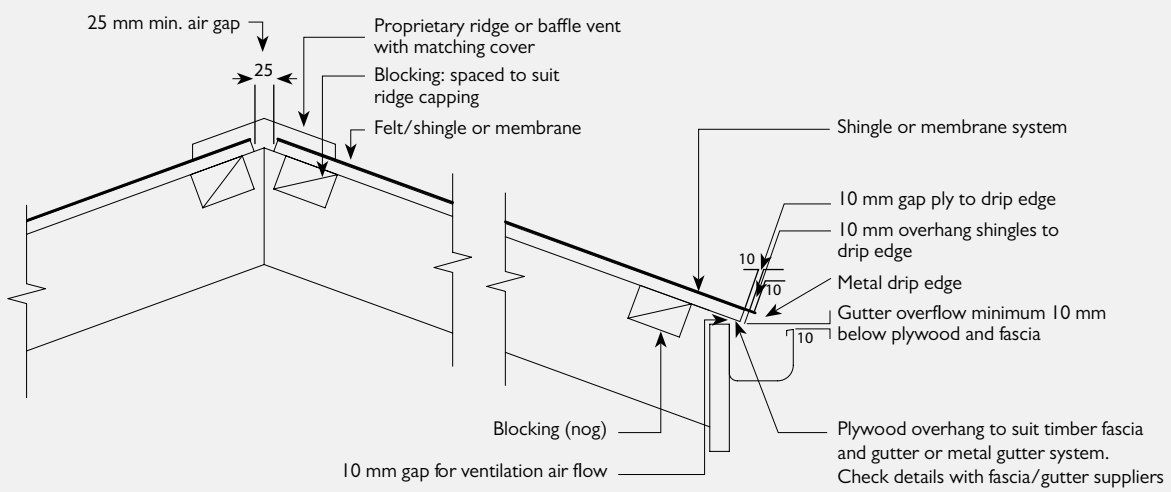


(use also with Hip Rafter if extra ventilation required)

EC004: Roof to wall junction vent



EC005: Truss ridge detail



Rain wetting and construction time

Untreated Ecoply will withstand a reasonable amount of rain wetting and exposure during construction for up to three months. In extreme weather conditions of high temperature and/or high rainfall this period may be less. Appearance issues such as discolouration and face checking of the sheet surface can be expected if Ecoply is exposed. For roofs uncovered for longer periods use H3 treated Ecoply to lower the risk of decay. Return Ecoply to below 18% moisture content before installing moisture sensitive materials, coverings, coatings or adhesives. Where a high visual finish is desired (such as membrane roofing and decking) protect Ecoply from exterior moisture during construction. For detailed information see section 4.1 Flexible Membrane Systems.

Gutter details

Where Ecoply structural plywood sub-sheathing supports roofing at gutters, a metal drip edge must be provided with appropriate gaps to shed water. Gutters should have a front edge overflow or ends lower than the back to shed water overflow away from framing and sub-sheathing Ecoply.

H3.2 CCA treatment is recommended for Ecoply sheets that protrude into gutters, with regular maintenance to avoid leaf mould (soil) development. Untreated Ecoply must not be exposed to gutter splash or moisture.

Fastener spacing for wind suction

Wind pressure applies withdrawal loads to nails holding plywood to purlins and trusses. For the frame spacing in Table 15A designers may use the following guidelines for wind zones expressed in NZS 3604.

Note: Full penetration of fasteners into the supporting member is assumed.

The main body of the roof

For wind zones up to and including high, use 60 x 2.8 mm nails spaced at 150 mm centres on all cross framing. For very high and extra high wind zones, use 75 x 3.15 mm nails spaced at 150 mm centres on all cross framing.

Roof edges

All Ecoply structural plywood used at local pressure suction zones at the roof edges, gutters, eaves and gable ends must be supported on framing, and fixed at 75 mm centres with minimum 60 x 2.8 mm nails for regions up to, and including high wind zones (use 75 x 3.15 mm nails for very high and extra high wind zones). Local pressure zones are interpreted from AS/NZS 1170 as being within 20% of the building length, width or the average of the gutter and ridge height.

Designers and builders should review site conditions to ensure adequate fixing is applied. Buildings in exposed sites and lee zones should be specifically designed using the loading standard (AS/NZS 1170) and the timber structures standard NZS 3603. In some wind conditions, the tiles themselves may be sucked from the plywood. Use a consulting engineer to assess site conditions, calculate wind pressures for the specific site, and determine the fastening and span requirements, and to check that the truss system can resist the loads being applied through the plywood.

Fixing of roofing

Fixing methods for tile, shingle and membrane systems must be designed for the expected wind and weather exposure to protect the Ecoply substrate. Some shingle systems may not be suitable for use in very high or cyclonic wind zones.

Follow the specifications of the roofing manufacturer and refer to the appropriate BRANZ Appraisals.

4.6 ROOFING – INSTALLATION

Framing

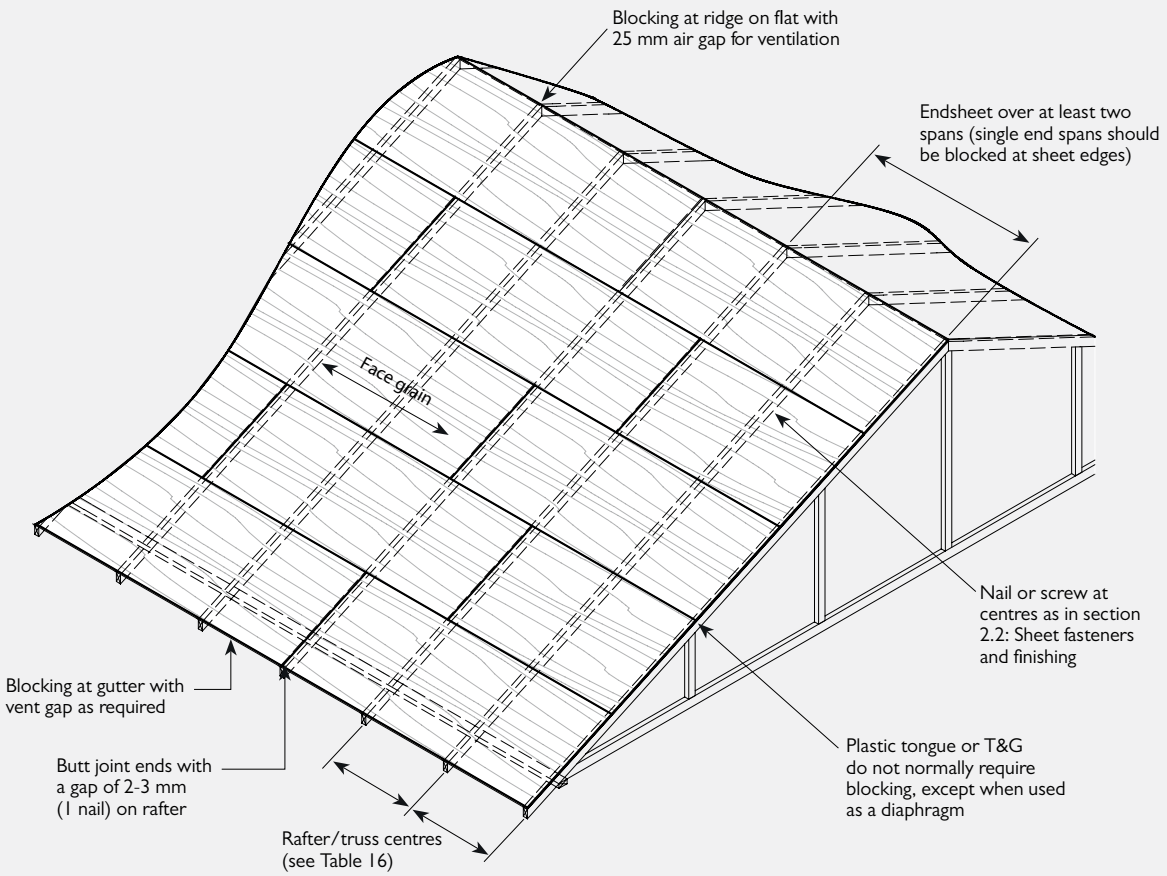
Frames should be at spacings to suit plywood thicknesses in Table 15A, page 25. Additional requirements for roof framing are:

- Ensure top edges of framing are properly aligned
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to lower moisture level in roof spaces, second floor spaces, and reduce differential truss, rafter or joist deflections

Blocking (nogs, dwangs)

- Block all edges of Ecoply Structural Square Edge plywood
- Block all edges at the ridge and gutter lines to prevent sag at capping or gutters
- Block for high face loads or under areas accessed for maintenance
- Blocking within the body of the roof is not required under tongue and grooved edges when using Ecoply Flooring & Roofing, unless required for framing stability or the plywood is being used as a diaphragm to resist horizontal wind or earthquake loads. In this case fixings transfer shear across the joints and details should be specified on drawings
- Use blocking on the flat to provide gaps where air flow is needed for ventilation
- Specific roofing suppliers may require blocking to suit their system

EC006: Sheet and framing layout



Sheet layout

- Ensure Ecoply sheets are dry before installation
- Place face grain at right angles to supports
- Sheets must be continuous over at least two spans (three framing members)
- Lay the sheets in a staggered pattern
- Allow sufficient clearance inside confining structure such as concrete or brick walls adjacent to the roof. Use extra allowances with large areas
- Allow clearance for ventilation as required

Fixing of sheets

Ecoply may be fixed to different types of framing with nails, screws or a combination of fasteners and construction adhesives.

Fasteners should be corrosion resistant to a level appropriate to the end use life expectancy (15 or 50 years) and expected exposure to moisture. Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

The integrity of a plywood based roof system is directly related to how well the panels are fixed to the framing. Ecoply must be fixed to resist wind suction loads, and to maintain surface qualities of the overlying roof covering.

- Always refer to the roofing system supplier for system requirements
- For roofing, check the additional requirements according to wind exposure
- For very exposed sites, cyclonic conditions or roofs above 10 metres in height, carry out specific structural design to the relevant standards
- Screw fixing must be used for membrane roofing, and is preferred for all systems because of increased holding power and avoidance of head popping
- For minimum fastener spacing for wind suction, refer section 4.5 Roofing - Design Considerations - Fastener spacing for wind suction

Fixing to timber frames

- Ring shank nails or annular grooved nails or screws are recommended for additional holding power
- Use flathead nails. Do not use jolt or bullet head nails
- Stainless steel nails must be annular grooved
- Ensure fastener is compatible with the roofing cover (consult roofing system supplier)
- Staples may be used provided that the withdrawal load is equivalent to the hand driven galvanised flathead nail. A suggested minimum is a 50 mm long staple with 12 mm crown and legs 1.8 mm diameter. Space staples 20% closer than nails. Refer to the manufacturer's information for corrosion resistance and durability

Fixing to steel frames

- Fix directly to roll formed steel (up to 2 mm thick) with self-drilling, self-tapping screws. If plywood gets damp and expands, screws in thicker steel may shear. Keep Ecoply dry or use larger screws or;
- Bolt or screw battens to the steel and apply Ecoply as above for timber. Ensure that battens have adequate thickness for the minimum nail or screw length
- H3.2 CCA treated plywood must not be fixed to steel framing

5.0 FLOORING

The following section covers the use of Ecoply Flooring plywood used as a flooring substrate with flexible and rigid overlays. Ecoply Flooring is suitable as a substrate for overlays such as carpet, tiles and some membrane products (refer to flooring manufacturer).

5.1 FLOORING – RANGE

- Ecoply Flooring features a void free second layer under the surface veneer for increased protection against moisture bubbles and punch through of the first veneer under high point loads than normal Ecoply Structural Square Edge plywood
- The tongue and groove on long sheet edges does not require support blocking under the joint (unless otherwise specified)
- Supplied in F8 stress grade (F11 available upon request)
- Ecoply 19 mm Longspan Flooring supplied as standard in F11/F8 stress grade
- Supplied standard with a sanded C grade surface with D grade back
- Sanded B grade surface is available in 19 mm thickness (untreated only) for clear finish applications. Designers must expect the surface to dent or mark more easily than hardwood flooring systems as Ecoply is manufactured from relatively soft radiata pine.
- Available untreated or H3.2 CCA treated, (H3.1 LOSP treated available upon request)
- LOSP treated plywood is not recommended for internal applications
- Refer to Table 1 for range and treatment options

5.2 FLOORING – INSTALLATION

Table 17: Flooring Frame Spacings

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing				
	Ecoply nominal thickness (mm)				
	15	17	19	21	25
1. Domestic flooring 2kPa - 1.8kN	480	540	600 F11[1] Longspan	600	750
2. Institutional and public assembly up to 4kPa - 2.7kN		300	480	540	750
3. Institutional and crowd assembly up to 5kPa - 3.6kN			400	450	600
4. Corridors, industrial up to 5kPa - 4.5kN			300	400	540
5. Domestic garage floor** 2.5kPa - 9kN					270

** Provide blocking to all edges of the sheet.

- Use the next lower recommended frame spacing or thicker Ecoply flooring where appearance is critical
- To suit frames at 900 centres, 2700 long sheets are available. See Table 16

[1] Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain. Please contact CHH Woodproducts for Span/360 deflection limits for internal membrane areas

Floor loads

For domestic garage floors blocking is required under all edges to control wheel loads on the tongue. Testing with 113 mm diameter load head (0.01 m^2) confirms commercial floor capabilities.

Refer to Table 16 to match frame set outs with 2400 mm and 700 mm sheet modules.

Framing

- Joist spacings should be at spacings to suit plywood thicknesses in Table 17
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to achieve a moisture content of 18% or less

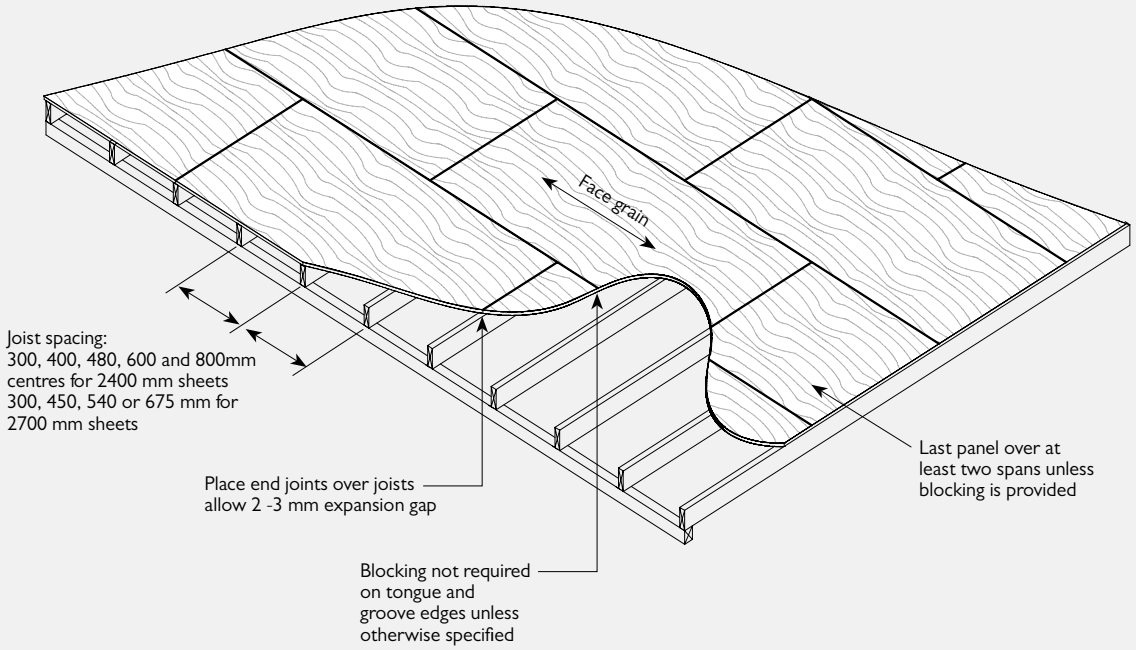
Blocking

- Blocking within the body of the floor is not required under tongue and groove edges unless otherwise specified (such as in domestic garage floors)

Sheet layout

- Ensure Ecoply sheets are dry before installation
- Place face grain at right angles to supports
- Sheets must be continuous over at least two spans (three framing members)
- For panels at floor edges where a continuous two span coverage is not possible, sheet edges must be supported by blocking
- Lay sheets in a staggered pattern
- Allow clearance for ventilation as required

EC007: Ecoply® Flooring layout



Fastener selection and treatment

Fasteners should be corrosion resistant to a level appropriate to the end use, life expectancy (15 or 50 years) and expected exposure to moisture.

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Fasteners and fixing of sheets

- Ecoply Flooring may be fixed with nails or screws or a combination of mechanical fasteners and construction adhesives
- For fastener specifications (including lay out and sizes) refer to section 2.2: Sheet Fasteners and Fixing
- For construction adhesive specifications refer to section 2.3: Adhesives
- Ring shank or annular grooved nails, or screws are recommended for additional holding power
- To reduce the risk of fastener popping or floor squeak the use of construction adhesives is advised.
- Do not use jolt or bullet head nails

5.3 FLOORING – FINISHING

- Overlays and coatings should be applied following the manufacturer's specifications
- Avoid heavy sanding that may remove the critically important structural face veneer
- Adhesives must be compatible with CCA (Copper Chrome Arsenic) treatment in H3.2 CCA treated sheets. Compatibility can often be improved by lightly washing, scrubbing and drying the plywood surface prior to fixing
- Where clear or stained finishes are desired, designers should select sheets and protect the floor as much as possible from the weather and construction activities
- Ecoply is made from relatively soft radiata pine and as such will dent or mark more easily than hardwood flooring systems. This is to be expected and designers must consider the long term appearance requirements of the project. Ecoply Flooring is a good substrate for harder wearing flooring overlays, and is not primarily intended for clear finishing, especially if it is exposed to moisture during construction
- For improved surface finish, floors should be protected from weather during construction as soon as possible

6.0 FREQUENTLY ASKED QUESTIONS

Q: How much space should be allowed for expansion?
A: Allow a 2 - 3mm expansion gap between square edges of Ecoply® sheets. If using Ecoply Flooring, a 5 mm expansion gap is recommended at the perimeter of the floor or deck. Check by calculation for large areas.

Q: Can power driven nails be used to fix Ecoply?
A: Paslode power driven nails have been tested for fixing Ecoply and Shadowclad® plywood products for particular bracing and cladding applications. For power driven nail specifications refer to the Paslode Special Fixing Applications document available from http://www.paslode.co.nz/images/fix-app-CHH-woodproducts.pdf. Use the Paslode Impulse Compact Nailer fitted with a No Mar(k) work contact element to eliminate any contact marks on the plywood. Adjust the work contact element to the flush position and fire the nail at 90° to the work surface. Hammer any nails flush which are left proud. Do not overdrive.

Q: How close to sheet edges can I nail?
A: Fixings must be at least 3 fastener diameters or 7 mm from the sheet edge.

Q: Do I have to use stainless steel nails when using Ecoply for bracing?
A: Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances.Where stainless steel nails are required, annular grooved nails must be used.

Q: What is the weight of Ecoply?
A: Refer to Table 4A for weight (kg/m^2) of different Ecoply thicknesses.

Q: What is the R-value of Ecoply?
A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (k) of 0.13 W/mK so a 12 mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Q: Are there any compatibility issues when using Ecoply with other materials?
A: Adhesives for flexible rubber membranes may react with LOSP treatment and should therefore only be applied to H3.2 CCA treated Ecoply unless the membrane supplier advises differently. Check with the membrane manufacturer if in doubt. H3.2 CCA treatment is also corrosive and this must be taken into account when specifying H3.2 CCA treated plywood next to metals. For further guidance, refer to Tables 21 and 22 in Acceptable Solution E2/AS1.

Q: Can Ecoply be used as a rigid sheathing (air barrier)?
A: CHH has a specific system called Ecoply Barrier. Ecoply Barrier has been developed as a rigid air barrier. Refer to the current Ecoply Barrier Specification & Installation Guide for further information. 7mm H3.2 CCA treated Ecoply can also be used if combined with building underlay in accordance with E2/AS1 for a rigid air barrier system.

Q: What is the relevance of AS/NZS 2269?
A: Ecoply structural plywood is manufactured to AS/NZS 2269 Plywood Structural. This Standard is referenced by the NZBC Compliance Documents including NZS 3602 Timber and Wood-based Products for Use in Building, NZS 3603 Timber Structures, NZS 3604 Timber Framed Buildings, AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood and Acceptable Solution E2/AS1 - External Moisture. Plywood not manufactured to AS/NZS 2269 does NOT meet the requirements of these NZBC Compliance Documents.

Q: What is the relevance of the PAA stamp?
A: Ecoply is manufactured under a third party audited, product quality control programme by the Engineered Wood Products Association of Australasia (EWPAA) to monitor compliance with AS/NZS 2269. Given that compliance with Standards is not actively policed by Standards New Zealand, this third party auditing provides important peace of mind for users and consumers of Ecoply plywood products.

Q: What is marine ply?
A: Marine plywood manufactured to AS/NZS 2272 Plywood Marine may contain species of low durability (source: BRANZ Good Practice Guide – Timber Cladding). Whilst marine plywood has a Type A glue bond, it is generally specified for its high surface appearance grade and lack of core knots as opposed to structural performance. AS/NZS 2272 limits marine plywood to a number of approved species that pass stringent property requirements for things like moisture permeability. These requirements are different from those in standards from other countries. Marine plywood is rarely treated as it is usually coated with resin, fibreglass, or a paint finish for long term durability.

Q: What should a specification for structural plywood include?
A: A specification for structural plywood should include:

Specification check list	Example
Quantity/size	20 sheets of 2400 x 1200
Thickness	12 mm
Edge finish	Square edge
Brand name	Ecoply® structural plywood
Reference to Standard	To AS/NZS 2269
Stress grade[1]/layup	F8 (12-24-5)
Surface grade/bond type	CD A-Bond[2]
Accreditation	EWPAA product certified[3]

1 Stress grades may vary between different manufacturers and products.
2 Type A-bonds are suitable for permanent exposed applications and structural applications.
3 The EWPAA JAS-ANZ Product Certification Mark certifies that Ecoply structural plywood products have been manufactured under a third party audited joint product certification programme to monitor compliance with AS/NZS 2269

Q: What are F-grades?

A: The stress grading system is a ranking system which utilises the symbol F and a suffix 8, 11 etc as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. For plywood of a given thickness, the higher the F-grade, the further it will span. For load bearing applications (e.g. flooring, roofing) the required F-grade as well as the plywood thickness must be specified to achieve the required span. F8 is the most common structural plywood grade found in New Zealand. All Ecoply® structural products are F8. Ecoply 15 mm roofing and Ecoply 19 mm Longspan Flooring are F11/F8. Other Ecoply Flooring products are also available in F11 upon request.

Q: What are surface/appearance grades (eg CD)?

A: Appearance grades (eg BD, CD, DD) denote the appearance grade of the plywood including the number and size of knot holes as defined in AS/NZS 2269 and summarised in Table 2A & 2B of this guide. The first letter describes the appearance of the face veneer and the second letter describes the back face.

Q: How long can Ecoply be left exposed to the weather?

A: Untreated Ecoply will typically maintain its structural integrity when exposed to the weather during construction for up to 3 months. The surface colour will start to silver off and face checking will become evident. Where the finished appearance of the Ecoply is important, it should be protected during construction. Ecoply is also available H3 treated to resist decay or insect hazard. When used in accordance with this guide, it can be specified to meet the durability requirements of the NZBC, however appearance issues such as face checking may still occur dependent upon the degree of exposure to weather during construction.

Q: What treatment levels and types are used for Ecoply?

A: Ecoply is available untreated or preservative treated. Ecoply is treated to the H3 hazard class for above ground use. The standard Ecoply treatment type is H3.2 CCA (Copper Chrome Arsenate) although H3.1 LOSP Azole (Light Organic Solvent Preservative) may also be specified where a clear treatment is required. LOSP Azole is the standard treatment type for BD, Grooved Lining and Shadowclad®. CCA treatment gives the plywood sheets a green tinge and the drying process after CCA treatment may leave fillet marks on the face of the sheet.

Q: Does Ecoply have to be treated when used as structural bracing?

A: Ecoply used as bracing must be treated unless it is installed in an interior dry situation. Note, behind exterior cladding and in cavities (even if the Ecoply is covered with building wrap) are not considered to be an interior dry situation.

Q: Do I have to re-treat cut edges of treated Ecoply?

A: It is important to re-treat any cuts and holes with a brush on remedial treatment such as Holdfast® Metalex® Clear.

Q: What type of glue is used to manufacture Ecoply?

A: Phenol formaldehyde (PF) resins are used to bond the plywood veneers. This forms a Type A (Marine) bond suitable for structural applications and exterior use. Phenol formaldehyde resins are dark red/brown in colour. Product details printed on the back of Ecoply sheets indicate the 'A Bond'.

Q: Does Ecoply emit formaldehyde?

A: Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply and Shadowclad meets the lowest formaldehyde emission class (E_0 - less than 0.5 mg/litre). Actual formaldehyde emissions have been tested to be less than 0.3 mg/litre.

Q: How should Ecoply be installed to maximise its stiffness properties?

A: Structural plywood has greatest stiffness along the long grain of the sheet (i.e. along its length). Therefore, flooring/roofing should be laid across joists/rafters rather than parallel to them.

7.0 REFERENCES AND SOURCES OF INFORMATION

- New Zealand Building Code (NZBC)
- CHH Woodproducts technical notes - downloadable from www.chhwoodproducts.co.nz/document-library
- NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber"
- NZS 3602:2003 "Timber and Wood-based products for use in Buildings"
- NZS 3603:1993 "Timber Structures Standard"
- NZS 3604:2011 "Timber Framed Buildings"
- AS/NZS 1170:2011 "Structural design actions"
- AS/NZS 2269:2012 "Plywood Structural"
- AS/NZS 1604.3:2010 "Specification for Preservative Treatment, Part 3: Plywood"
- AS 1684:2010 "Residential Timber Framed Construction"
- US Product Standard PS1-95
- Acceptable Solution 'E2/AS1 – External Moisture'
- Acceptable Solution 'B2/AS1 – Durability'
- BRANZ Bulletin 345: Flat membrane roofs – design and installation
- BRANZ Bulletin 346: Flat membrane roofs – materials
- BRANZ Bulletin 289: Asphalt shingle roofing
- BRANZ Appraisals 307, 404, 411
- Shadowclad® Specification & Installation Guide for Cavity Construction
- Ecoply® Barrier Specification & Installation Guide
- Material Safety Data Sheets
  - MSDS Azole Treated Plywood, LVL & I-Joists
  - MSDS H3 CCA Treated Plywood & I-Joist
  - MSDS Untreated Plywood
- APA (www.buildabetterhome.org)
- EWPAA (www.ewp.asn.au)
- Product Technical Statement for Ecoply available online (www.chhwoodproducts.co.nz/product-technical-statements)
- EWPAA Technical Note - Plywood Roofing and Flooring: Installation and detail factors

Standards can be purchased online at www.standards.co.nz
Building Code Compliance Documents can be downloaded free of charge at www.dbh.govt.nz

8.0 LIMITATIONS

The information contained in this document is current as at September 2015 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply products installed in accordance with this document or NZBC compliance documents.

This publication replaces all previous CHH Woodproducts design information and literature relating to Ecoply structural plywood products. CHH Woodproducts reserves the right to change the information contained in this document without prior notice.

It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Woodproducts assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

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September 2015

JAS-ANZ

PRODUCT CERTIFIED paa ENGINEERED WOOD

ewpaa

NEW ZEALAND MANUFACTURED

H1 CALCS

NZBC H1 - Calculation Method

Client	Bunn
Address	Lot 460 Hoffman St
	Christchurch

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	127.32	3.30	38.58	
Roof Type 2	Trimed Insulation area	11.16	3.30	3.38	
Wall Type 1	70% Total Wall Area	106.65	2.00	53.32	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	100mm slab on ground	138.48	1.30	106.52	
Glazing (30%)	Double Glazed Std Alu Frame	45.71	0.26	175.79	
Glazing (>30%)	Double Glazed Std Alu Frame	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.31	0.00	
				377.60	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	127.32	3.32	38.35	
Roof Type 2	Trimed Insulation area	11.16	2.07	5.39	
Wall Type 1	70 Series Brick veneer	119.34	2.23	53.52	
Wall Type 2	Linea Weatherbds 20mm cavity	2.21	2.24	0.99	
Wall Type 3		0.00	1.00	0.00	
Floor	100mm slab on ground	138.48	1.28	108.19	
Glazing (30%)	Double Glazed Std Alu Frame	30.80	0.26	118.46	
Glazing (>30%)	Double Glazed Std Alu Frame	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.31	0.00	
				324.89	TOTAL LOSS

Component	Description	Area sq m	
Wall Type	Total Area East, South & West	112.02	
Glazing (30%)	Total Area East, South & West	11.82	10.55%

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ◉
Walls ○
Roofs ○

Date: 30/09/2020

Element Name (optional) **1.28** m²°C/W

Type: Floor: Slab Floor

Slab Floor view detail

internal surface 0.09

Flooring : none (Example: polished surface of a concrete floor)

R-value: 0.00

Slab Insulation

Slab floor area [m²]:	138.4		
Perimeter length [m]:	62.06		
External wall thickness [mm]:	90		
Soil conductivity [W/m °C]	1.2		
Underslab insulation:	none	Insulation :	
Piles Footings:	Number:	Penetration Diameter [mm]:	
Slab edge insulation:	none	Insulation :	

Print Page

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ◉
- Roofs ○

Element Name (optional) — **2.24** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : James Hardie Linea weatherboard
R-value: 0.08

Air Barrier : 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*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

H1 compliance calculator, now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the new Design Navigator message board.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ◉
Roofs ○

Wall: Veneer wall with timber framing and bulk insulation (vented)

external surface 0.03

Veneer: 70mm brick
R-value: 0.06

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Air Barrier: Building paper
R-value: 0.01

Timber Frame & Cavity: 90mm, studs @ 600mm, dwangs @ 800mm

Frame Area: 15.1% *Cavity Area: 84.9%*

Timber Frame
R-value: 0.75

Insulation: 2.6

still Airgap: 20-90mm airgap (non-reflective)
R-value: 0.16

Wall Lining: Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

Resulting R-value: 2.23 m²K/W.

Print Page

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 30/09/2020

Element Name (optional) — **3.32** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : 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%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 127.3 Number of downlights: 27 Clearance from lamp holder side [m]:

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 30/09/2020

Element Name (optional) — **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : 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%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 11.16 Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

RISK MATRIX

NZBC E2 - Risk Matrix	
Client	Lyn Bunn
Address	Lot 460
	Christchurch

Risk Factor	Low	Medium	High	Very H	Score	Select
Wind Zone	0	0	1	2	**1**	Wind High
No. of Storeys	0	1	2	4	**0**	1 Storey
Roof / Wall	0	1	3	5	**3**	Roof/Wall High
Eaves Width	0	1	2	5	**0**	Eaves Low
Envelope	0	1	3	6	**3**	Envelope High
Decks/Balcony	0	2	4	6	**0**	Deck/Balcony Low
			Total Score		**7**	

Note: Claddings in Extra High Wind Zones require Rigid Underlays & Drained Cavities.
Scores are the same as Very High Wind Zone

	Cladding	Cavity	Risk Score
North Elevation	Masonary	Drained Cavity	7
East Elevation	Bevel-back Weatherboards	Drained Cavity	7
South Elevation	Masonary	Drained Cavity	7
West Elevation	Masonary	Drained Cavity	7

Wind Zone	
Low Risk	NZS3604 Low Wind Zone
Medium Risk	NZS3604 Medium Wind Zone
High Risk	NZS3604 HIgh Wind Zone
Very High Risk	NZS3604 Very High Wind Zone
Extra High Risk	NZS3604 Extra HIgh Wind Zone

Number of Storeys	
Low Risk	One Storey
Medium Risk	Two Storey in part
High Risk	Two Storey
Very High Risk	More than Two Storeys

Roof / Wall Junctions	
Low Risk	Roof/wall intersections fully protected eg hip & gable roof with eaves
Medium Risk	Roof/wall intersections partly protected eg hip & gable roof no eaves
High Risk	Roof/Wall intersection fully exposed eg parapets, reverse slope eaves
Very High Risk	Roof elements finishing within wall clad eg lower ends of aprons, chimneys

Eaves Width	
Low Risk	Greater then 600mm at first level
Medium Risk	450-600mm at first level or greater than 600mm at second level
High Risk	100-450mm at first level or 450-600mm at second level
Very High Risk	0-100mm at first level or 100-450mm at second level of 450-600mm at third level

Envelope Complexity	
Low Risk	Simple rectangle, L, T or bommerang shape, single cladding
Medium Risk	Complex, angular or curved building shapes, single wall claddings
High Risk	Complex, angular or curved building shapes, multiple wall claddings
Very High Risk	As for High Risk but with junctions not covered in Table 1C or !F, box windows, pergolas

Decks & Balconies	
Low Risk	None or timber slatted deck or porch at ground level
Medium Risk	Fully roofed waterproof deck or timber slatted deck at 1sy or 2nd level
High Risk	1st level waterproof deck or 1st level cantilevered slatted deck
Very High Risk	2nd level waterproof deck or 2nd level cantilevered slatted deck

Suitable Wall Claddings		
Risk Score	**Direct Fix**	**Drained Cavity**
0 - 6	Timber Weatherboards Fibre Cement Weatherboards Vertical Profiled Metal - Corro or Trim Fibre Cement Sheet (Jointed) Plywood Sheet	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Fibre Cement Sheet (flush finish) EIFS
7 - 12	Bevel-backed Timber Weatherbds Vertical Timber Board & Batten Vertical Profiled Metal - Corro Only	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS
13 - 20	Vertical Profiled Metal - Corro Only	Masonry Stucco Horiz Profiled Metal - Corro/Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS Bevel-back Weatherboards
Over 20	Redesign Specific Design	

SOILS REPORT

New Zealand Institute of Architects Incorporated

ACENZ

Building Code Clause(s) B1

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: The Engineering Company Ltd (ENGCO)
(Design Firm)

TO: Rock Solid Foundations
(Owner/Developer)

TO BE SUPPLIED TO: Christchurch City Council
(Building Consent Authority)

IN RESPECT OF: Ribraft Slab
(Description of Building Work)

AT: Lot 460 Hoffman Street, Prestons Park,
(Address)

Town/City: Christchurch **LOT** 460 **DP** ..... **SO** .....
(Address)

We have been engaged by the owner/developer referred to above to provide:

Structural design of the Ribraft Floor Slab including the verification of the internal load bearing thickenings required specific to this design.
(Extent of Engagement)

services in respect of the requirements of Clause(s) B1 of the Building Code for:

☐ All or ■ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

■ Compliance Documents issued by the Ministry of Business, Innovation & Employment AS1/VM4 or
(verification method/acceptable solution)

☐ Alternative solution as per the attached schedule.....

The proposed building work covered by this producer statement is described on the drawings titled:

Engco: Bunn House, Lot 460 Hoffman Street, Prestons Park and numbered 20005.26/ S1-S6 (18.09.20);
together with the specification, and other documents set out in the schedule attached to this statement.

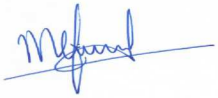
On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions Please see attached addendum
(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ■ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, Matthew Cusiel (Name of Design Professional) am: ■ CPEng 161509 # ☐ Reg Arch ..... #

I am a member of: ■ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE(hons),CMEngNZ,CPEng
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY Matthew Cusiel (Name of Design Professional) (Signature) 

ON BEHALF OF The Engineering Company Ltd (ENGCO) (Design Firm) Date 18.09.2020

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

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

ADDENDUM TO PRODUCER STATEMENT – PS1 – DESIGN

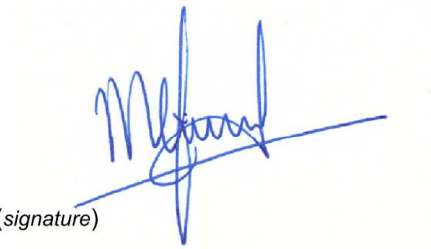
ISSUED BY:	The Engineering Company Ltd (ENGCO) *(Design Firm)*
TO BE SUPPLIED TO:	Christchurch City Council *(Building Consent Authority)*
IN RESPECT OF:	Ribraft Slab *(Description of Building Work)*
AT:	Lot 460 Hoffman Street, Prestons Park, Christchurch *(Address)*

The design has been verified in accordance with **AS1/VM4** of the approved Compliance Documents issued by the Department of Building & Housing and subject to:

i. The site is not subject to earthquake induced liquefaction settlements beyond MBIE Technical Classification 1 (TC1) limits.
ii. This slab has been designed in accordance with the recommendations of the Geotechnical Report by **Aurecon dated 21 August 2020, Ref: 235361**. The site shall be excavated to soils with consistent "Ultimate" bearing capacity of 200kPa. All filling shall be completed under the supervision of a suitably qualified person.
iii. Engco Consulting (*or its agent*) is responsible for conducting all pre-pour inspections required in order to issue a PS4 on completion in accordance with the attached inspection schedule.
iv. All proprietary products meeting their performance specification requirements;

I, M. Q. Cusiel, am a Chartered Professional Engineer, CPEng#161509, and am a Member of Engineering New Zealand. The Engineering Company Ltd holds a current policy of Professional Indemnity Insurance no less than $200,000*.

Signed by M. Q. Cusiel, BE(hons), CMEngNZ, CPEng, IntPE
on behalf of The Engineering Company Ltd, 2/596 Ferry Road, Woolston, Christchurch



(*signature*) Date: 18 September 2020

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

Schedule of Engineering Inspections	
Inspection Stage	**Purpose of Inspection**
Site stripping	Confirm all turfed soil stripped and bearing capacity is adequate
Ribraft Slab pre- pour	Once all reinforcing is placed and chaired

It is the contractor's responsibility to notify **The Engineering Company Ltd** 48 hours **(office@engco.co.nz)** before engineering inspections are required. The total number of inspections will depend upon the construction methodology and staging. Additional inspections from those listed above may be required upon conditions found on site. See also, local territorial authority requirements for construction monitoring.

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

THE BUILDING

Street address: Lot 460 Hoffman Street,	
Suburb: Prestons Park	
Town/City: Christchurch	Postcode:8083

THE OWNER

Name(s): Bunn

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, Matthew Cusiel 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
Primary structure			
Foundations and subfloor framing (✓)	*Design of Ribraft floor slab*	( ) Carried out (✓) Supervised	
Other (×)		( ) Carried out ( ) Supervised	

ISSUED BY

Name: Matthew Cusiel, CPEng	LBP or Registration number: 161509
The practitioner is a: ( ) Design LBP ( ) Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): The Engineering Company Ltd	
Mailing address (if different from below):	
Street address / Registered office: 2/596 Ferry Rd	
Suburb: Woolston	Town/City: Christchurch
PO Box/Private Bag:	Postcode: 8023
Phone number: 03 366 7955	Mobile:
After Hours:	Fax:
Email address: matt.cusiel@engco.co.nz	Website:

DECLARATION

I Matthew Cusiel [*name of practitioner*] , 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: 18 September 2020

aurecon

Prestons Park Subdivision

GEOTECHNICAL REPORT FOR LOT 460

CDL Land NZ Limited

21 August 2020

Revision: 1

Reference: 235361

Bringing ideas to life

Document control record

Document prepared by: James Muirson

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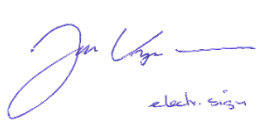
Document ID			**Project number**		235361	
File path		P:\235361\069 Stage 2 Building Consent\Geotech\Building Consent Reports\Lot 460\235361 Building Consent Report Lot 460.docx				
Client		CDL Land NZ Limited				
Client contact		Jason Adams	**Client reference**			
Rev	**Date**	**Revision details/status**	**Author**	**Reviewer**	**Verifier** (if required)	**Approver**
0	20 October 2014	Draft for Review	J Muirson	J Muirson	J Kupec	T Browne
1	21 August 2020	Final for Issue	F Monteith	J Muirson		J Kupec
Current revision		**1**				

Approval			
Author signature		Approver signature	
Name	Fraser Monteith	Name	Dr Jan Kupec
Title	Engineering Geologist	Title	Technical Director

Contents

Appendices

1 Executive Summary

CDL Land NZ Ltd has commissioned Aurecon New Zealand Ltd to undertake site specific geotechnical investigations and assessments for individual residential lots for building consent purposes for the Prestons South Subdivision Stage 2. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the residential house on Lot 460 at the Prestons South Subdivision.

As part of the subdivision development extensive geotechnical testing, including cone penetration tests (CPTs), were carried out to define the liquefaction potential at the overall subdivision and to monitor the site works that have occurred. **Based on our information the property is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) set by the Ministry of Business, Innovation and Employment (MBIE) in their guidelines issued in December 2012.**

The site development has included extensive bulk earthworks. All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. The engineering sign off and bulk earthworks are documented in the Geotechnical Completion Report. The earthfill at the subdivision construction stage was placed and signed off in accordance with NZS4431:1989. Based on review of the available geotechnical information, including bulk earthworks information and NZS4431 compliance records, we consider that a determination in accordance with NZS3604:2011 Section 3.1.3 is appropriate and the property meets the requirements for NZS3604 type foundations.

The geotechnical site specific assessment comprised a review of previous geotechnical investigations undertaken for the subdivision development and a site specific geotechnical investigation. A single hand auger borehole was undertaken to assess the upper soil profile and groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot, one of the DCPs was located immediately adjacent to the hand auger borehole with the second DCP located on the opposite half of the lot.

Based on our knowledge of the site setting and our past work we recommend that any residential structure that is to be developed on Lot 460 be founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa, which for Lot 460 is achieved at a minimum depth of 0.4m below ground level as this represents the current thickness of the topsoil and loose soil.

This report shall be read as a whole. Our limitations are presented in Section 7.

2 Introduction

CDL Land NZ Ltd is currently undertaking a large residential subdivision with associated commercial lots. Previously Aurecon New Zealand Ltd has undertaken detailed geotechnical investigations and assessments for the purpose of the plan change, subdivision resource consent application, liquefaction assessment, technical classification of the entire subdivision, and observation of bulk earthworks construction.

Aurecon New Zealand Ltd has since been commissioned to undertake site specific geotechnical investigations and assessment of individual lots for building consent application purposes. The site which this report is focused on comprises a single lot, designated Lot 460 at the Prestons South Subdivision to the south of Prestons Road in Marshland, Christchurch. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the proposed house on the lot. We note that at the time of writing this report the location and structural form of the dwelling were unknown, and it is inferred to comprise NZS3604:2011 type residential buildings only.

This report shall be read as a whole. Our limitations are presented in Section 7.

3 Site Conditions

3.1 Site Description

The Prestons Subdivision is located on the northern fringes of Christchurch City. The site is made up of a series of adjacent properties forming an irregular and elongated rectangle shape, orientated approximately north to south. The total area of the overall Prestons Subdivision site is approximately 190ha. The site can be separated into two distinct blocks, Prestons North which runs from the Lower Styx Road in the north through to Prestons Road in the south and the Prestons South development which continues from Prestons Road through to Mairehau Road to the south.

This building consent report is for Lot 460 which is located in Stage 2 of the Prestons South Subdivision development (refer Figure 1 in Appendix A). The lot is bordered by residential lots to the north, west and south, with an access road to the east.

3.2 Surface Water

There are no natural sources of surface water on the subdivision.

3.3 Regional Geology

The geology of the site is described in the 1:250,000 scale geological map – '*Geology of the Christchurch Area*', published in 2008 by the Institute of Geological and Nuclear Sciences. Note this map has been referenced as it is at an appropriate scale and covers the entire site. The map indicates the underlying geology comprises '*Dominantly sand of fixed and semi-fixed dunes and beach deposits'* and '*drained peat swamp*'. The subdivision geotechnical investigation identified that this area was predominantly underlain by aeolian (dune) and beach sand deposits.

The GNS Active Fault System database (GNS, 2012a) indicates that the site is located approximately:

- 27km north east of the eastern end of the Greendale Fault System. Movement on the Greendale Fault System was responsible for the Magnitude 7.1 Darfield (Canterbury) Earthquake on 4 September 2010.
- 14km north of the epicentre of the Magnitude 6.2 Christchurch Earthquake on 22 February 2011.
- 12km north west of the Magnitude 6.0 earthquake on 13 June 2011 (GNS, 2012b).
- 8km north west of the Magnitude 5.9 earthquake on 23 December 2012.

3.4 Site Earthworks

Site earthworks have been undertaken to prepare the site for residential building purposes. The subsurface profile was stripped back and the site was built up with compacted engineered fill. During bulk earthworks shallow organic material, where encountered, was removed as part of the bulk earthworks.

All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. Details of the site bulk earthworks are provided in the Aurecon report titled '*Prestons Park Subdivision – Stages T6, T7 & U2 Geotechnical Completion Report Rev 0'* dated 13 August 2020. The Geotechnical Completion Report has been completed as part of the requirements of NZS4404:2010 '*Land development and subdivision infrastructure*' and Christchurch City Council '*Infrastructure Design Standards - Part 4: Geotechnical Requirements*'. The compacted fill was placed and signed off in accordance with NZS4431:1989 '*Code of practice for earth fill for residential development'*.

3.5 Technical Classification

The landcheck maps historically provided on The Canterbury Earthquake Recovery Authority (CERA) website indicated the site is classified as rural and unmapped. The technical categories were developed by the Ministry for Business, Innovation and Employment (MBIE) with the support from the Engineering Advisory Group (EAG) in mid-2011 and hence prior to the start of the subdivision development. The site has since been modified by civil engineering and bulk earthworks.

As part of the subdivision consent geotechnical assessment, site specific liquefaction assessment was carried out over the wider subdivision area. This is detailed in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013.

Based on the results from our liquefaction assessment and bulk earthworks undertaken on the wider subdivision, Lot 460 is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) in the MBIE Guidelines issued in December 2012.

4 Geotechnical Assessment

4.1 General

The geotechnical assessment comprised a review of relevant previous geotechnical investigations and construction data and an in-situ geotechnical investigation. The geotechnical investigation comprised hand held testing on the individual lot and a review of the previous geotechnical investigations undertaken for the subdivision within the vicinity of the lot. A single hand auger borehole was undertaken to assess the upper soil profile and the groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot. The hand held testing was undertaken on the lot following the site earthworks. The testing density is considered reasonable as the geotechnical project engineers were involved in the observation of the civil engineering works.

4.2 Previous Investigations

The previous geotechnical testing and investigations undertaken by Aurecon across the entire subdivision site comprised of a combination of cone penetrometer tests (CPT) and machine excavated test pits. Further details regarding these investigation locations are found in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013. In addition, testing carried out as part of the subdivision development is presented in the Aurecon Geotechnical Completion Report.

4.3 Hand Held Testing

One hand auger borehole was undertaken on the lot as part of the geotechnical investigation to assess the upper soil profile and the groundwater level. The test location and the borehole log have been uploaded to the New Zealand Geotechnical Database (NZGD). The borehole log is attached in Appendix B.

The hand auger borehole log indicates the upper soil profile consists of topsoil underlain by sand to the termination depth. The hand auger borehole was terminated when soil samples became saturated and the hole started to collapse.

The logging of the recovered hand auger samples was undertaken in accordance with the New Zealand Geotechnical Society's *"Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes: 2005".*

4.4 Dynamic Cone Penetrometers

Two DCPs were carried out with the locations and results uploaded to the NZGD. The DCP test results are attached in Appendix B. One of the DCPs was located adjacent to the hand auger borehole, with the second DCP located on the opposite half of the lot.

DCP logs indicate 5 blows per 100mm penetration, which is equivalent to an ultimate bearing capacity of 300kPa, was consistently encountered from a shallow depth.

4.5 Groundwater Levels

Groundwater levels were measured within the hand auger borehole at the time of the investigation and correlated to our site specific knowledge. An indicative groundwater level was noted where holes collapsed due to saturated soil. Groundwater was encountered at approximately 2.1m depth below ground level. It should be noted that groundwater levels may vary seasonally.

A review of the NZGD indicates that regional groundwater levels are likely to be in the order of 1m to 2m below ground level. These groundwater levels are reasonably consistent with those measured during the investigation, when taking into account the subdivision earthworks filling and cutting.

4.6 Topsoil Depth

The depth of topsoil has been determined from the single hand auger and two DCPs undertaken on site. We note that the topsoil depths may vary by +/- 100mm between the testing locations and hence it is recommended that at least a 100mm tolerance should be allowed for building foundation excavations.

If greater certainty of topsoil depths across the whole site is required for construction costing then further testing would be necessary across the footprint of the proposed structure (unknown at the time of writing this report). **The responsibility and liability for any additional testing shall be met by the section purchaser.**

5 Foundation Recommendations

The site is expected to perform in line with TC1 requirements in future earthquakes. Due to the residential land use of the development, the presence of certified fill and the TC1 technical classification, future residential development will be able to adopt standard NZS3604 compliant foundations.

5.1 Foundation Types

It is recommended that residential structures that are built on Lot 460 are founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa. The site investigation results indicate that approximately 350mm of topsoil was present, which will need to be removed and the clean subgrade exposed for foundation construction.

Based on our understanding of the site works and the investigation results, we recommend that NZS3604:2011 compliant foundations are embedded a minimum depth of 0.4m below current ground level.

5.2 Foundation Construction Recommendations

Construction should proceed in accordance with the NZS3604:2011. Topsoil should be removed from beneath the floor slab and compacted hardfill placed under the floor slab to the required level. In addition, the following recommendations should be considered:

1. To ensure that excavated footings are adequately founded we recommend that excavations should be undertaken by a digger fitted with a smooth edge bucket. The base should be tidily trimmed by hand, lightly compacted with a plate compactor and immediately covered with a concrete tidy slab or 100mm of compacted granular hardfill. A suitable qualified engineer with foundation experience or territorial authority building inspector should be retained to verify the adequate founding has been achieved and all loose and soft or compressible material was removed.
2. If there are significant soft layers beneath a sub-excavation, the softer material will have to be excavated and backfilled with 10MPa concrete or compacted hardfill underneath all load bearing foundation elements. For the hardfill, the sub-excavation will have to have plan dimensions of B+2D where B is the footing width and D is the depth of undercut. For 10MPa concrete the sub-excavation can have the same dimensions as the footing.
3. Depending on the soil encountered, the time of year, and fluctuations of the groundwater level, it is possible that excavations may encounter groundwater. The building contractor is to take appropriate measures to deal with any groundwater ingress to the foundation excavations and keep the excavations and backfill free of groundwater intrusions until the footings are cast.
4. The footing excavations are likely to expose layers of granular soils, which can be adversely affected by rainfall or stormwater. Foundation excavations should not be left open for more than three days. In addition, rainfall and stormwater should not be allowed to pond within the footing excavations as this may affect the bearing capacity of the subsoils.

6 References

Forsyth, Barrell & Jongers, (compliers), 2008. *Geology of the Christchurch Area*. Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 16.

New Zealand Geotechnical Database (2016). Retrieved 1 May 2017 from https://www.nzgd.org.nz

Christchurch City Council, 2010. *Infrastructure Design Standards - Part 4: Geotechnical Requirements.*

Geonet, 2012. ftp://ftp.geonet.org.nz/strong/processed/Proc (23/10/12)

GNS, 2012a. http://maps.gns.cri.nz/website/af/viewer.htm (23/10/12)

GNS, 2012b. http://www.gns.cri.nz/Home/News-and-Events/Media-Releases/earthquake-part-of-aftershock-sequence (23/10/12)

Ministry of Business Innovation and Employment (MBIE), 2012 '*Repairing and rebuilding houses affected by the Canterbury earthquakes'.*

NZGS, 2005. *Guidelines for the Classification and Field Description of Soils and Rocks in Engineering*. NZ Geotechnical Society Inc, Wellington, New Zealand.

NZS 3604:2011. *Timber Framed Buildings*. Standards New Zealand, Wellington, New Zealand.

NZS 4404:2010 *Land development and subdivision infrastructure*. Standards New Zealand, Wellington, New Zealand.

NZS 4431:1989 *Code of practice for earth fill for residential development*. Standards New Zealand, Wellington, New Zealand.

7 Explanatory Statement

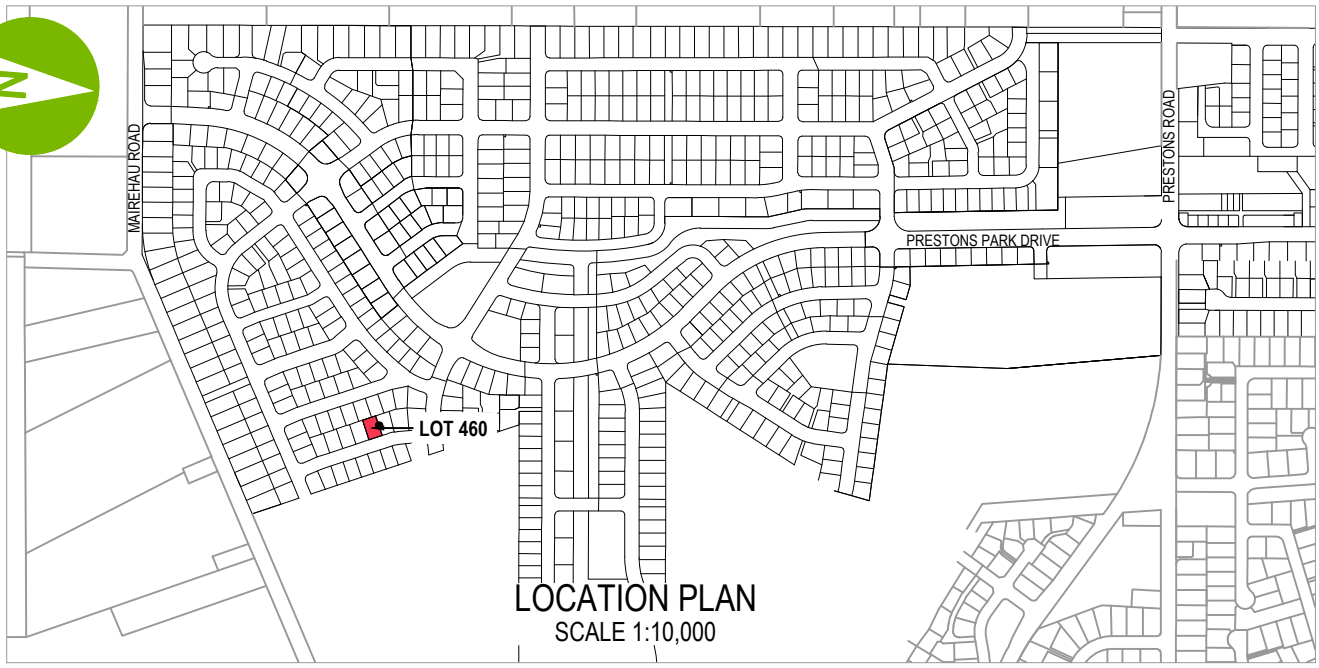
We have prepared this report in accordance with the brief as provided. The contents of the report are for the sole use of the Client for the purpose of building consent application only, and no responsibility or liability will be accepted to any other third party. Data or opinions contained within the report may not be used in other contexts or for any other purposes without our prior review and agreement.

The recommendations in this report are based on data collected at specific locations and by using suitable investigation techniques with limited site coverage. Only a finite amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground and groundwater between test locations has been inferred using experience and judgment and it must be appreciated that actual conditions could vary from the assumed model.

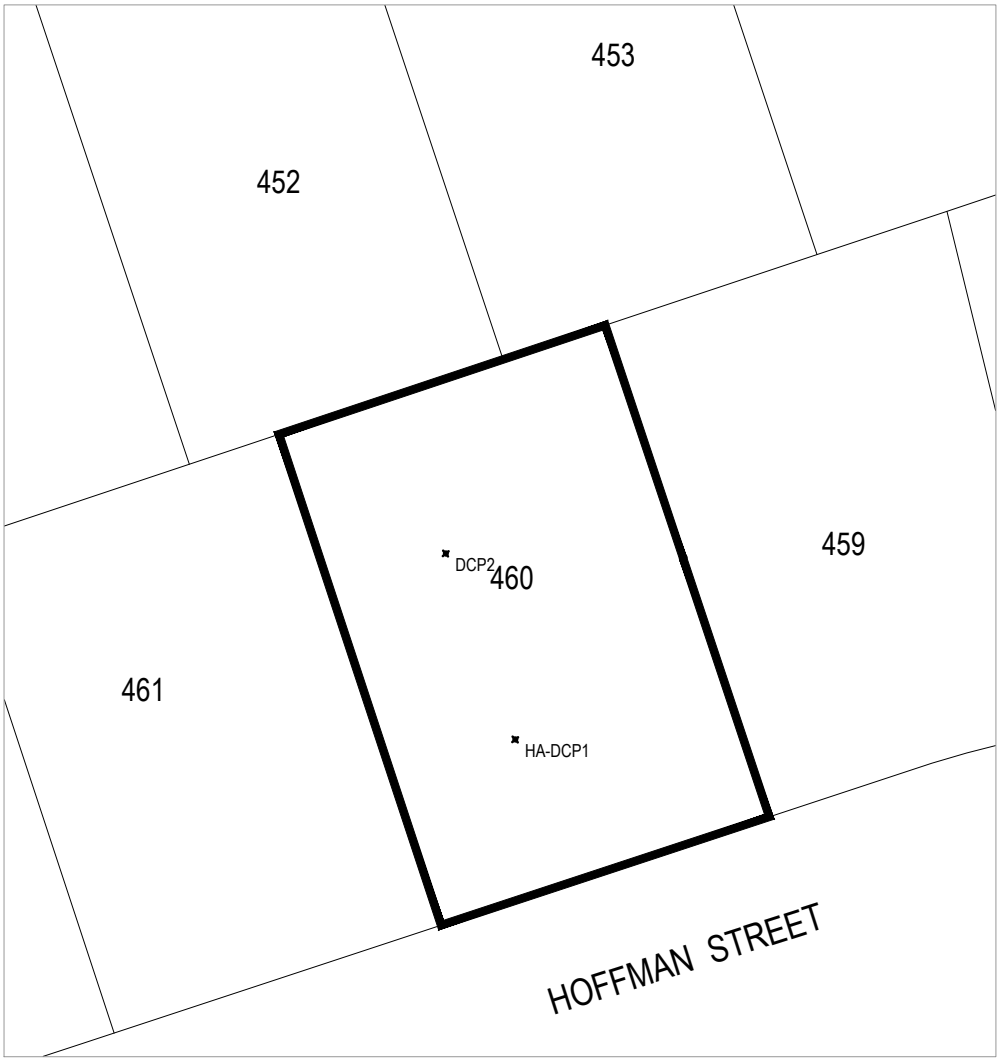
Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

Subsurface conditions, such as groundwater levels, can change over time. This should be borne in mind, particularly if the report is used after a protracted delay.

Appendix A
Figures



LOCATION PLAN
SCALE 1:10,000



4 0 8 16m
SCALE 1:400

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CLIENT
PRESTONS PARK

REV	DATE	REVISION DETAILS	APPROVED
A	11/07/19	ISSUE FOR INFORMATION	T BROWNE

DRAWN	DESIGNED
R DAWSON	
CHECKED	
J MUIRSON	
APPROVED	DATE
T BROWNE	
T BROWNE	

PROJECT
PRESTONS PARK

TITLE
LOT 460
SITE LOCATION PLAN
FIGURE 1

INFORMATION
NOT FOR CONSTRUCTION

PROJECT No.	
235361	
SCALE	SIZE
1:400	A4
DRAWING No.	REV
GO-PS-S2-IN-460	A

Appendix B
Test Results

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HAND AUGER RECORD

HOLE NO. **HA1**

PROJECT NO. **235361**

PROJECT	**Prestons Park Subdivision Lot 460**		
CLIENT	**CDL Land NZ Ltd**	CO-ORDINATES (NZTM) **E 1573584 N 5185495**	SHEET **1** of **1**
METHOD	**HA**		DATE from **10/08/2020** to **10/08/2020**
MACHINE & NO.	**NA**	ORIENTATION **VERTICAL**	GROUND-LEVEL **+13.54** m RL

Water level	Tests	Samples (Type Ref Depth)	Reduced Level	Depth (m)	Legend	STRATA DESCRIPTION
		0.00		0.00		Silty fine SAND and trace rootlets; brown. Moist. [TOPSOIL]
			+13.19	0.35		Fine to medium SAND; light brown. Dense, moist.
		HA				0.60m ... Very dense.
▼						1.90m ... Wet.
						2.10m ... Saturated.
			+11.24	2.30		End of Hand Auger at 2.30m, on 10/08/2020 *Termination Reason:* Effective refusal, hole collapse

- Small Disturbed Sample
- Large Disturbed Sample
- SPT Liner Sample
- Thin Wall Undisturbed Sample
- U100 Undisturbed Sample
- Pocket Penetrometer Test
- Piston Sample
- Water Level
- Impression Packer Test
- Standard Penetration Test
- Permeability Test
- Piezometer / Standpipe Tip
- Packer Test
- In-situ Vane Shear Test

LOGGED **F. MONTEITH**

DATE **10/08/2020**

CHECKED **K. FOOTE**

DATE **18/08/2020**

REMARKS

Groundwater encountered at 2.1m bgl.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Report ID: AGS4 HAND AUGER RECORD || Project: LOT 460.GPJ || Library: AGS 4_0.GLB || Date: 21 August 2020

Aurecon, Level 2 Iwikau Building, 93 Cambridge Terrace, Christchurch 8013. Tel: 03 366 0821 Fax: christchurch@aurecongroup.com

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www.aurecongroup.com

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO.
DCP1

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573584
N 5185495

GROUND LEVEL **+13.54** m RL

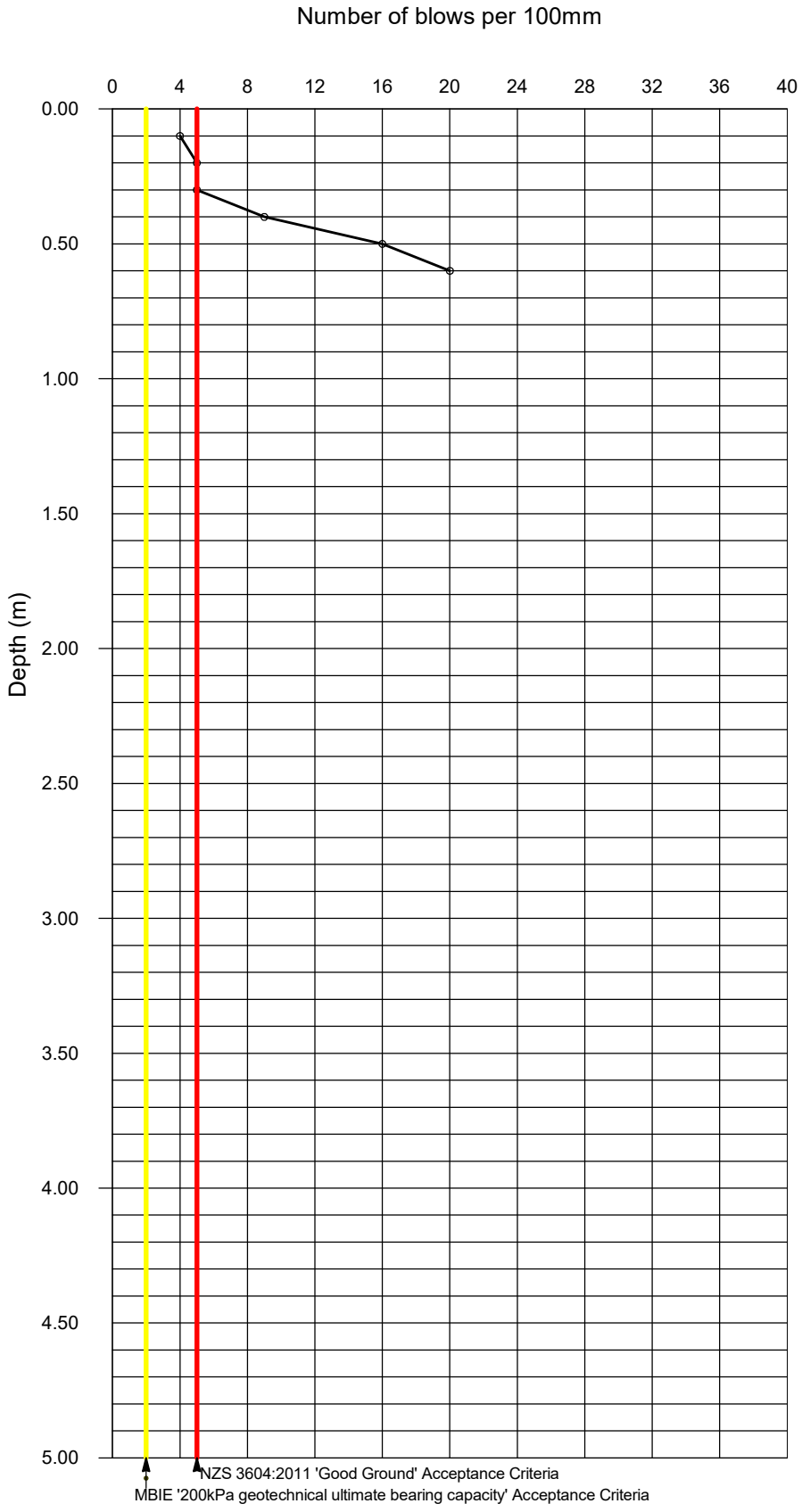
TESTED / SUPERVISED BY **F. MONTEITH**
DATE **10/08/2020**

CHECKED BY **K. FOOTE**
DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	5
	5
	9
0.5	16
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

20 blows for 100mm in the last increment.
Co-ordinates and elevation data from site survey.
Elevation based on Christchurch Drainage Datum.
Effective refusal, 20+ blows per 100mm

Report ID: AGS4 DCP (SCALA) RECORD (5M) || Project: LOT 460.GPJ || Library: AGS 4_0.GLB || Date: 21 August 2020

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO. **DCP2**

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573574
N 5185491

GROUND LEVEL **+13.56** m RL

TESTED / SUPERVISED BY **F. MONTEITH**

DATE **10/08/2020**

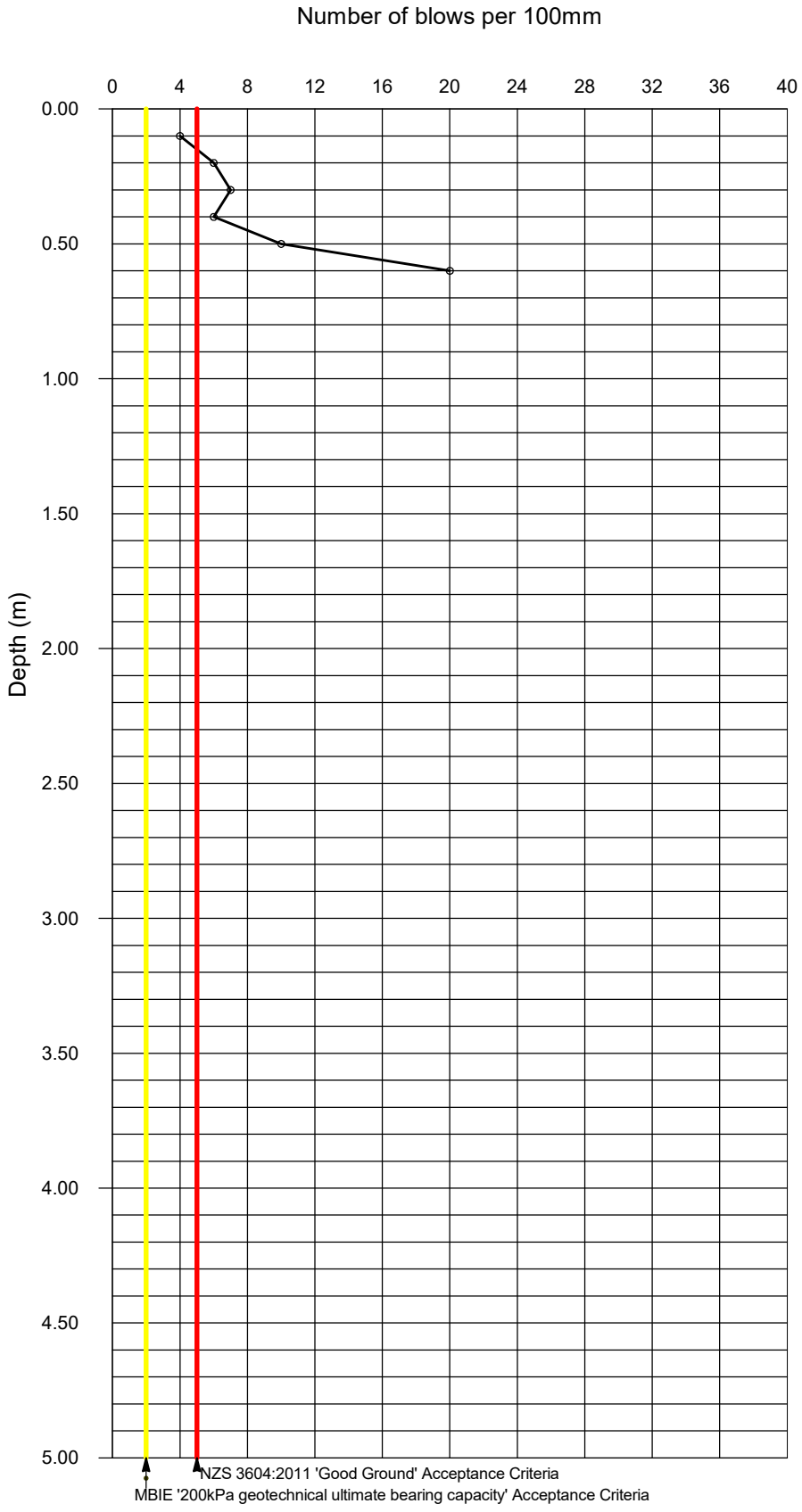
CHECKED BY **K. FOOTE**

DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	6
	7
	6
0.5	10
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

4 blows for 20mm in the last increment.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Effective refusal, 20+ blows per 100mm

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Bringing ideas to life

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Namibia, New Zealand, Nigeria,
Philippines, Qatar, Singapore, South Africa,
Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam.

EXTERIOR CLADDING

Linea™ Oblique™ | JH™
WEATHERBOARD

Vertical Installation Technical Specification

JULY 2018 | NEW ZEALAND

Contents

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie™
literaturefeedback@jameshardie.co.nz

1 Application and scope

1.1 APPLICATION

Linea™ Oblique™ Weatherboard installed as per this specification gives a vertical rusticated profile weatherboard appearance. Linea Oblique Weatherboard can be fixed to timber-framed external walls. A wide range of colours can be used, varying from light to dark. Linea Oblique Weatherboard is available in 200mm or 300mm wide x 4200mm or 2700mm lengths and is 16mm thick.

Specifiers

If you are a specifier or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Installers

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this James Hardie Technical Specification. All of the details provided in this document must be read in conjunction with the project specification.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 SCOPE

This specification covers the installation of Linea Oblique Weatherboard fixed vertically over James Hardie horizontal cavity battens on buildings that fall within the scope limitation of NZS 3604 and E2/AS1 of the New Zealand Building Code (NZBC).

This specification also covers the installation of Linea Oblique Weatherboard on projects, which are subject to specific engineering design (SED) up to a wind pressure of 2.5kPa (ULS).

1.3 DETAILS

Various typical Linea Oblique Weatherboard vertical construction details are provided in the Details section of this document. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded from our website at www.jameshardie.co.nz.

All dimensions shown are in millimetres unless noted otherwise.

1.4 SPECIFIC DESIGN

For use of Linea Oblique Weatherboard in a specific engineering design (SED) project that is outside the scope of this literature, the designer, architect or engineer must ensure that applicable clauses of the NZBC have been considered and a specific design has been undertaken.

Linea Oblique Weatherboard is suitable for use in SED project up to a wind pressure of 2.5kPa (ULS).

2 Design

2.1 COMPLIANCE

Linea Oblique Weatherboard has been isued a CodeMark certification number GM-CM30059 which confirms Linea Oblique Weatherboard is deemed to comply with the requirements of the NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the CodeMark certificate. Linea Oblique Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with this Linea Oblique Weatherboard Vertical Installation technical specification. BRANZ Appraisal number 897 (2015) at www.branz.co.nz or www.jameshardie.co.nz.

CODEMARK 30059

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and details, which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All New Zealand Standards referenced in this document are current editions and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 ‘Surface Water’. Foundation design must comply with the requirements of NZS 3604 ‘Timber-framed Buildings’ or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulation in accordance with the NZBC requirements.

2.4 SURFACE CLEARANCES

The clearance between the bottom edge of the cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

Linea Oblique Weatherboard must overhang the bottom plate by a minimum of 50mm, as required by E2/AS1.

Linea Oblique Weatherboard must maintain a minimum clearance of 100mm from paved ground, and 175mm from unpaved ground.

On roofs and decks, the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground, refer to Figure 3.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration. The building should also be ventilated sufficiently to control moisture accumulation due to condensation, especially in artificially cooled/heated buildings.

Walls must include those provisions as required by the NZBC Acceptable Solution Clause E2/AS1. In addition, all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in external walls, must comply with the requirements of relevant standards and the NZBC. For further guidance on designing for weathertightness, refer to BRANZ Ltd. and the Ministry of Business Innovation and Employment (MBIE) updates on the following websites respectively, www.branz.co.nz and www.building.govt.nz.

In addition, the following issues must also be considered:

- Sealant must be installed where detailed in this literature
- Where the walls are higher than two storeys, it is necessary to provide a horizontal flashing at the second floor level to drain the cavity
- The installation of smoke chimneys, pipe penetrations and other fixtures etc. must not track moisture into the wall or restrict the drainage of moisture to the exterior

2.6 STRUCTURE

2.6.1 Timber Framing

Timber-framed buildings must either be in accordance with NZS 3604 (Timber-framed Buildings) or designed as per specific engineering design. For a building requiring a specific engineering design, the framing stiffness must be equivalent to, or more than, the stiffness requirements of NZS 3604.

For specific design projects, the timber framing must be designed in accordance with the requirements of NZS 3603 and AS/NZS 1170.

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections generated by loadings etc.

2.6.2 Wind Pressures

Linea Oblique Weatherboard is suitable for use in wind zones up to and including EH as defined in NZS 3604.

Linea Oblique Weatherboard is also suitable for use in specific design projects up to wind pressures of 2.5kPa (ULS).

2.7 FIRE RATED WALLS

Linea Oblique Weatherboard when fixed over timber cavity battens to external walls can achieve fire ratings up to 60/60/60 to comply with Clause C/AS1 of the NZBC, when the walls are constructed in accordance with the current James Hardie ‘Fire and Acoustic’ Design Manual.

Linea Oblique Weatherboard is classified as a 'non-combustible' material suitable for use on walls close to a boundary.

2.8 STRUCTURAL BRACING

Linea Oblique Weatherboard installed as per this specification cannot be used to achieve structural bracing. However, bracing can be achieved by using a James Hardie rigid air barrier board installed direct to framing instead of a flexible underlay or by using the Villaboard™ Lining bracing system on the internal face of the wall. Refer to the James Hardie Bracing Design Manual for further information.

2.9 ENERGY EFFICIENCY

External walls constructed as per this technical specification using Linea Oblique Weatherboard and bulk insulation, where the area of glazing is 30% or less of the total wall area, complies with the insulation requirements for walls in the NZBC Acceptable Solution H1/AS1 (Energy Efficiency Clause H1), Table 1.

To meet thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulations having higher R-values. The thermal insulation of a wall changes when the size or spacing of timber framing is increased or decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and using an internal lining material such as Villaboard Lining or a 10mm plasterboard.

Table 1

Insulation capability		
Climate zone	**R-value requirement**	**Minimum cavity insulation infill requirement**
1 and 2	1.9 m^2 ºC/W	R2.0*
3	2.0 m^2 ºC/W	R2.2*

Total construction R-value depends on the insulation material used and the framing ratio. The insulation material R-values specified in this table are for studs spaced at 600mm centres and nogs spaced at 600mm centres.

* To achieve higher R-values of construction the wall insulation material must be replaced with an insulation material having higher R-values to suit the requirements.

For further guidance on insulation requirements refer to the current edition of ‘House Insulation Guide’ published by BRANZ.

3 Framing

3.1 GENERAL

Linea Oblique Weatherboard can be fixed either to a timber-frame or steel-frame.

For fixing to a steel frame Ask James Hardie on 0800 808 868 for specific requirements.

For Linea Oblique Weatherboard Vertical Installation:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum

Note: For fixing Linea Oblique Weatherboard, fastener spacing is provided in Section 5.

3.2 TIMBER FRAMING

3.2.1 Dimensions

A 90 x 45mm minimum framing size is required.

3.2.2 Structural Grade

Timber grade used must be in accordance with timber grades specified in NZS 3604.

3.2.3 Durability

The external framing timber must be treated to a minimum H1.2 treatment. Higher treatment levels may be used, but check for the compatibility of treatment chemicals with other materials. Refer to the NZBC Acceptable Solution B2/AS1 Durability for further information about the durability requirements.

For timber treatment and allowable moisture content information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round Sawn Timber) for minimum timber treatment selection and treatment requirements.

Also refer to the framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at the site in accordance with the framing manufacturer's recommendations.

3.2.4 Frame Construction

Use of timber framing must be in accordance with NZS 3604 and the framing manufacturer's specifications. The framing must be rigid and must not rely on the cladding for stability. Timber framing sizes and its set-out must comply with NZS 3604 and as specified in this technical specification.

The following framing is required:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum
- An extra stud is required in internal corners
- For specific design projects exposed to wind speeds higher than 55m/sec the stud size and spacing must be as per the design requirements but not exceeding 600mm maximum

In case of gable end trusses sitting on top plates of the external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by an independent design producer statement.

3.3 SPECIAL FRAMING REQUIREMENTS

The following are special framing requirements for both timber and steel framing:

- Double studs are required at internal corners, refer to Figure 10
- Extra packers may be required at external corners

3.4 TOLERANCES

In order to achieve the required performance and an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with Table 2.1 of NZS 3604 and the manufacturer's specifications. All framing shall be made flush.

4 Preparation

4.1 FLEXIBLE UNDERLAY/HOMERAB PRE-CLADDING

Flexible underlay/HomeRAB™ Pre-Cladding must be provided as per the requirements of External Moisture Clause E2 of the NZBC. The flexible underlay selected for use must comply with Table 23 of E2/AS1.

The flexible underlay must be fixed in accordance with section 9.1.7 of E2/AS1 and the underlay manufacturer's recommendations.

Walls which are not lined on the inside face (e.g. garage walls or gable ends), must include a rigid sheathing or an air barrier behind the cladding which complies with Table 23 of E2/AS1. For attached garages, flexible underlays must be selected in accordance with the NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. James Hardie HomeRAB Pre-Cladding complies with these requirements and is suitable for use in this situation. It must be installed in accordance with the James Hardie Rigid Air Barriers installation manual.

4.2 RAB BOARD

For EH wind zone or for specific engineering design (SED) projects where the wind pressure is higher than 1.5kPa, James Hardie RAB™ Board must be used.

To achieve temporary weathertightness using James Hardie RAB Board, windows/doors need to be temporarily installed. Refer to the James Hardie Rigid Air Barriers installation manual for further information regarding its installation.

4.3 CAVITY CLOSURE/VENT STRIP

The James Hardie uPVC cavity vent strip must be installed at the bottom of all walls and above all openings constructed using the drained and ventilated cavity construction method. It is important that the openings in the cavity closure/vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. James Hardie cavity closure/vent strip has an opening area of 1000mm^2/m length.

4.4 CAVITY BATTENS

Linea Oblique Weatherboard must be installed on a cavity. The battens provide ventilation and drainage between the frame and the weatherboard and are considered a “packer” only in this specification.

The James Hardie horizontal cavity battens are H3.1 treated in accordance with NZS 3640 (Chemical preservation of rough and sawn timber) to comply with the durability requirements of B2/AS1.

James Hardie horizontal cavity battens meet the requirements of E2/AS1 and:

- Are minimum 20mm thick and 45mm wide
- Fixed horizontally to nogs
- Fixed vertically to studs at corners and openings
- Must be fixed by the cladding fixings to the main framing over the flexible underlay. Therefore until claddings are fixed the battens only need to be tacked to framing by 40 x 2.8mm or longer nails at 800mm centres
- Permit air circulation and water drainage

4.5 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following options:

- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut

No intermediate supports are required:

- When studs are spaced at 400mm centres; or
- When rigid air barriers are used

4.6 FLASHINGS

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to Linea Oblique Weatherboard installation. Refer to moisture management requirements in Clause 2.5. The flexible underlay/rigid air barrier must be appropriately incorporated with penetration and junction flashings using flashing tapes. Materials must be lapped in such a way that water tracks down to the exterior on the face of the flexible underlay or rigid air barrier board.

The selected flashing materials must comply with the durability requirements of the NZBC. For information refer to Table 20 of E2/AS1.

When using James Hardie rigid air barrier boards the entire framing around openings must be protected with a flashing tape. The tape must be finished over the face of the rigid air barrier. Ensure to check the compatibility of flashing tapes and sealants with their manufacturers. Refer to the James Hardie Rigid Air Barriers installation manual for further information.

4.7 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. For an example of window details for Linea Oblique Weatherboard which meet the performance requirements of E2 External Moisture, an approved document of the NZBC, refer to Figures 11 to 13.

5 Installation

5.1 GENERAL

Linea Oblique Weatherboard must be installed vertically using the cavity construction method as per the details and information published in this manual.

The two widths of Linea Oblique Weatherboard can be mixed to create the desired look.

Linea Oblique Weatherboard must be kept under cover whilst in storage or at sites and they must be dry at the time of their installation. All site-cut board edges must be sealed with Dulux Acraprime 501/1, Dulux 1 Step, Resene Quick Dry or a similar sealer compatible with the finish coat before installation.

Linea Oblique Weatherboard must be fully supported and fixed through James Hardie horizontal cavity battens. Ensure that cladding is hard against the battens to avoid drumminess.

This technical specification only covers the vertical installation of Linea Oblique Weatherboard. Refer to the Linea Oblique Weatherboard horizontal installation technical specification for horizontal installation.

5.2 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing materials to be used in relation to exposure conditions and are summarised in Table 2.

Fasteners must be fully compatible with the other materials that they are to be in contact with, to ensure the durability of the complete assembly.

Table 2

Exposure conditions and nail selection prescribed by NZS 3604		
NAIL MATERIAL		
Zone D	Zone C* outside sea spray zone, Zone B and geothermal hot spots	Bracing - all zones
Grade 316 Stainless	Hot-dipped galvanised or Grade 316 Stainless	Grade 316 Stainless

*Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made. Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 FASTENER – SIZE AND LAYOUT

Linea Oblique Weatherboard must be fixed vertically to framing using fixings as specified in Table 3 below and follow the edge distance required for nails as shown in the details.

Table 3

Weatherboard fixing up to and including VH wind zone		
CAVITY CONSTRUCTION OVER FLEXIBLE UNDERLAY		
Linea Oblique Weatherboard 200	65x2.87mm D head nail or 65x2.87mm RounDrive ring shank nail or 60x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate, refer to Figure 6
Linea Oblique Weatherboard 300	65x2.87mm D head nail or 65x2.87mm RounDrive ring shank nails or 60x3.15mm HardieFlex nail	Fix one nail 150mm from bottom edge of board per nog/plate, refer to Figure 7

Weatherboard fixing up to and including VH wind zone		
CAVITY CONSTRUCTION OVER HOMERAB PRE-CLADDING/RAB BOARD		
Linea Oblique Weatherboard 200	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate, refer to Figure 6
Linea Oblique Weatherboard 300	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 150mm from bottom edge of board per nog/plate, refer to Figure 7

Weatherboard fixing EH wind zone and SED projects		
CAVITY CONSTRUCTION OVER RAB BOARD		
Linea Oblique Weatherboard 200	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate Refer to Figure 8
Linea Oblique Weatherboard 300	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail at 150mm from bottom edge of board per nog/plate. Refer to Figure 9

For other fixing options Ask James Hardie on 0800 808 868.

- When fixing the weatherboards using nail guns, refer to the nail gun manufacturer for information about nails and the type of nail gun to be used
- D head nails - finish nails 2mm below weatherboard surface
- RounDrive nails - finish nails flush with weatherboard surface
- HardieFlex nails - finish nails flush with weatherboard surface

6 Joints

6.1 VERTICAL JOINT

Linea Oblique Weatherboard vertical joint shall be formed using the ship lap edge of the Linea Oblique Weatherboard. Ensure that the Linea Oblique Weatherboards are securely interlocked before nailing, refer to Figures 6 to 9.

6.2 HORIZONTAL JOINT

Linea Oblique Weatherboard can run continuously over floor joists without a flashed horizontal joint when LVL timber floor joists or engineered joist are used, refer to Figure 17.

When using a solid timber joist, a horizontal joint or a movement joint must be formed at floor joist, refer to Figure 19.

6.3 DRAINAGE JOINT

After every two floors a horizontal drainage joint flashing is required as per E2/AS1, refer to Figure 22.

6.4 EXTERNAL CORNER

An external box corner flashing is used to fix the external corners, refer to Figure 11. Alternatively an Axent™ Trim external boxed corner can also be formed, refer to Figure 12.

6.5 INTERNAL CORNER

An internal corner flashing is to be used to form an internal corner joint, refer to Figure 10.

An extra stud is required in internal corners.

Note: All joint mouldings to be fixed at 400mm centres both sides.

7 Finishes

7.1 PREPARATION

The D head nail must be finished 2mm below the weatherboard surface. The nail holes must be filled with an exterior grade two part builders fill, ie. CRC ADOS Builders Fill or similar two part external grade filler. The RounDrive nail heads must finish flush with weatherboard surface.

7.2 PAINTING

Linea Oblique Weatherboard is pre-primed and is suitable for site applied acrylic paints.

In order to seal cut edges or sanded patches, Dulux 1 Step, Acraprime 501/1, Resene Quick Dry, Taubmans Underproof Acrylic Primer Undercoat or a similar product should be applied. The primer should be compatible with the paint to be used.

Painting of Linea Oblique Weatherboard is mandatory to meet the durability requirements of the NZBC and the 25 year James Hardie product warranty. Linea Oblique Weatherboard must be dry and free of any dust or grime before painting. The weatherboards must be painted within 90 days of their installation. There is no restriction on the LRV of paint to be applied on the Linea Oblique Weatherboard.

James Hardie recommends a minimum of two coats of exterior grade acrylic paint. Follow the paint manufacturer's recommendations to prepare the surface and to adequately cover and conceal the weatherboard fixings.

7.3 FLEXIBLE SEALANT

Sealant used must comply with the relevant requirements of the NZBC. Their application and usage must be in accordance with the manufacturer's instructions. Check with the sealant manufacturer prior to coating over sealant. Some sealant manufacturers do not recommend coating over their product.

8 Storage and handling

When storing Linea Oblique Weatherboard, they must be laid flat on a smooth level surface. Edges and corners must be protected from chipping.

To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards become wet, allow them to dry thoroughly before fixing.

Do not carry weatherboards on the flat, carry on edge to avoid excessive bending.

9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to maintain the effectiveness of the cladding. The extent and nature of maintenance required will depend on the geographical location and exposure of the building.

As a guide, it is recommended that the basic normal maintenance tasks shall include, but not be limited to:

- Washing down exterior surfaces every 6-12 months*
- Re-coating exterior protective finishes**
- Regular inspection and repair if necessary of the cladding joints, sealants, nail head fillers
- Cleaning out gutters, down pipes and overflow pipes as required
- Pruning back vegetation which is close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained, especially where gardens are concerned
- The clearance between the bottom edge of the Linea Oblique Weatherboard and the finished/unfinished ground must always be maintained

**Do not use a water blaster to wash down the cladding. In extreme coastal conditions or sea spray zones, wash every 3-4 months.*

***Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.*

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

Linea Oblique Weatherboard is an advanced lightweight cement composite cladding, manufactured using James Hardie formulation. Basic composition is Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Linea Oblique'.

Linea Oblique Weatherboard is manufactured to Australian/New Zealand Standard AS/NZS 2908.2 ‘Cellulose-Cement Products’ (ISO 8336 ‘Fibre-Cement Flat Sheet’).

Linea Oblique Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 “Cellulose-Cement Products”.

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

10.2 PRODUCT MASS

Linea Oblique Weatherboard is manufactured in 16mm thickness and has a mass of 20.57kg/m^2 for 200mm and 19.67kg/m^2 for 300mm.

Linea Oblique Weatherboard is defined as a Light Weight Wall Cladding (not exceeding 30kg/m^2) as per NZS 3604.

10.3 DURABILITY

Linea Oblique Weatherboard and James Hardie rigid air barrier installed and maintained as per this technical specification will meet the durability requirement for cladding as per the NZBC clause B2 Durability.

10.3.1 Resistance to Moisture/Rotting

Linea Oblique Weatherboard is resistant to permanent moisture induced deterioration (rotting) and meets the requirements of the following tests in accordance with the AS/NZS 2908.2:

- Heat Rain (Clause 6.5)
- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Soak Dry (Clause 8.2.5)

10.3.2 Control of External Fire Spread

Linea Oblique Weatherboard meets the requirements of Appendix C C7.1.1 and is classified as ‘Non-Combustible Material’ which is suitable for use as external wall cladding and complies with the requirements of Paragraph 5.4 of the NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of Acceptable Solutions C/AS2 to C/AS6 of the NZBC.

10.3.3 Alpine Regions

In regions subject to freeze/thaw conditions, Linea Oblique Weatherboard and James Hardie rigid air barrier must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snowdrifts over winter are expected.

These products meet the requirements of the AS/NZS 2908.2 Clause 8.2.3.

11 Safe working practices

11.1 STAY HEALTHY WHEN WORKING WITH BUILDING PRODUCTS CONTAINING CRYSTALLINE SILICA

Crystalline Silica
What is it? Why and when is it a health hazard?

Crystalline Silica is
- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?
- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?
- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS AND INSTALLATION INSTRUCTIONS WHEN WORKING WITH JAMES HARDIE PRODUCTS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

11.2 AVOID BREATHING IN CRYSTALLINE SILICA DUST!

Safe working practices
- NEVER use a power saw indoors or in a poorly ventilated area
- NEVER dry sweep
- ALWAYS use M Class extractor unit as a minimum and always hose down with water/wet wipe for clean up
- NEVER use grinders
- ALWAYS use a circular sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance
- ALWAYS follow tool manufacturers' safety recommendations
- ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ALWAYS wear an approved properly-fitted, approved dust mask (P1 or P2) or respirator

Use one of the following methods based on the required cutting rate:

BEST
- HardieKnife™
- Hand guillotine
- Fibreshear

BETTER
- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and M Class extractor unit.

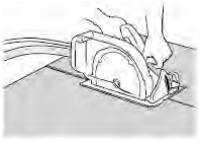
Working outdoors
- Make sure you work in a well ventilated area
- Position cutting station so wind will blow dust away from yourself and others in the working area
- Cut products with either a HardieKnife™ or fibre cement shears or, when not feasible, use a HardieBlade™ Saw Blade (or equivalent) and a dust-reducing circular saw attached to a M Class extractor unit
- When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or P2 mask (correctly fitted in accordance with manufacturers' instructions) and when others are close by, ask them to do the same
  - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
  - Wear safety glasses
  - Wear hearing protection
  - When others are close by, ask them to do the same

Working indoors
- Never cut using a circular saw indoors
- Position cutting station in a well ventilated area
- Cut ONLY using a HardieKnife™, hand guillotine or fibreshears (manual, electric or pneumatic)
- Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class extractor unit

IF CONCERN STILL EXISTS ABOUT EXPOSURE LEVELS OR YOU DO NOT COMPLY WITH THE ABOVE PRACTICES, YOU SHOULD ALWAYS CONSULT A QUALIFIED INDUSTRIAL HYGIENIST.

Working Instructions

- Refer to Recommended Safe Working Practices before starting any cutting or machining of product



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut

Hole-Forming

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill

For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

11.3 STORAGE AND DELIVERY

Keeping products and people safe

Off loading

- James Hardie products should be off-loaded carefully by hand or by forklift
- James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

- In their original packaging
- Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- Off the ground – either on a pallet or adequately supported on timber or other spacers
- Flat so as to minimise bending

James Hardie products must not be stored:

- Directly on the ground
- In the open air exposed to the elements

JAMES HARDIE IS NOT RESPONSIBLE FOR DAMAGE DUE TO IMPROPER STORAGE AND HANDLING.

11.4 TIPS FOR SAFE AND EASY HANDLING

Weatherboard products

- Do not lift planked products flat and in the middle
- Carry the products on the edge
- If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- If two people are carrying the plank, hold it near each end and on edge
- Exercise care when handling weatherboard products to avoid damaging the edges/corners

Sheet products

- Carry with two people
- Hold near each end and on edge
- Exercise care when handling sheet products to avoid damaging the edges/corners

12 Product and accessories

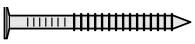
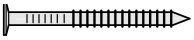
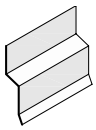
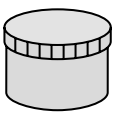
Linea Oblique Weatherboard information					
Product	**Description**	**Size (mm)**			**Code**
		Thickness	**Length**	**Width**	
	**Linea Oblique Weatherboard** A 16mm profiled weatherboard for residential cladding. Factory sealed on all six sides. Each weatherboard has a manila white colour primer applied on its face, which accepts a wide range of paint finishes.	16	2700 4200	200 300 200 300	**404855** **404856** **404849** **404848**

Note: All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Accessories/tools supplied by James Hardie			
Accessories	**Description**	**Size**	**Code**
	**James Hardie Horizontal Cavity Batten 20mm** H3.1 Timber treated batten the cladding is fixed over	2700mm long	**305862**
	**Oblique Trimline Joint Flashing** Aluminium extrusion used behind cladding at horizontal joints.	3000mm long	**305826**
	**JH Weatherboard Internal 'W' Corner** Anodised aluminium extrusion used to create internal corners.	2700mm long	**300386**
	**Linea Oblique Weatherboard External Box Corner** Anodised aluminium extrusion used to create external corners.	2700mm long 4000mm long	**305825** **305873**
	**uPVC Vent Strip** PVC moulding used as vermin proofing.	3000mm long	**302490**
	**Trimline Horizontal Jointer** A jointer to cover the butt joint of Oblique Trimline Joint Flashing	100mm long	**305871**
	**Trimline External Corner Jointer** Joins Trimline Joint Flashing at an external corner		**305870**
	**Trimline Internal Corner Jointer** Joins Trimline Joint Flashing at an internal corner		**305872**
	**Linea Oblique Plug** To fill recess in Linea Oblique Weatherboard		**305930**
Tools			
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included.	184mm 254mm	**300660** **303375**

Accessories/tools not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with Linea Oblique Weatherboard and James Hardie rigid air barrier. James Hardie does not supply these products and does not provide a warranty for their use. Please contact component manufacturer for information on their warranties and further information on their products.

Product	Description
	**Flexible underlay** Must comply with Table 23 of E2/AS1.
	**Flexible window opening flashing tape** A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this manual for more information. e.g. Protecto or SUPER-STICK Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
	**Rigid air barrier vertical joint sealing tape** The tape to be used to seal James Hardie rigid air barrier vertical joints. SUPER-STICK Building Tape ® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
	**Flexible Sealant** Bostik Seal N Flex-1, Sikaflex AT Facade, Sikaflex MS or similar.
	**65 x 2.87mm 'D' head nail or 65 x 2.87 RounDrive nail** (ring shank hot dipped galvanised/stainless steel) For fixing Linea Oblique Weatherboard.
	**75 x 3.06mm 'D' head nail or 75 x 3.15 RounDrive nail** (hot dipped galvanised or ring shank stainless steel) For fixing Linea Oblique Weatherboard.
	**40 x 2.8mm or longer HardieFlex™ nail.** For fixing timber cavity battens and aluminium flashings.
	**Meter box** Refer electrical suppliers.
	**Head flashing** Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.
	**Exterior grade filler** CRC ADOS Builders Fill or similar two part filler to fill over nail holes

13 Details

The following generic details have been provided in this document for cavity construction methods.

Table 5

Details		
Description	**Cavity Construction**	
	Figure No.	**Page No.**
Framing set out	Figure 1	15
Cladding and James Hardie horizontal batten setout	Figure 2	16
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Vertical joint 200mm weatherboard width up to VH wind zone	Figure 6	18
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Vertical joint 200mm weatherboard width EH wind zone and SED	Figure 8	19
Vertical joint 300mm weatherboard width EH wind zone and SED	Figure 9	20
Internal corner	Figure 10	20
External aluminium box corner	Figure 11	21
External box corner	Figure 12	21
Window sill	Figure 13	22
Window head	Figure 14	22
Window jamb	Figure 15	23
Window jamb flashing	Figure 16	23
Over joist at floor level	Figure 17	24
Butt jointing of Vertical Linea Oblique Weatherboard	Figure 18	25
Trimline flashing joint at floor level	Figure 19	25
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Trimline joint	Figure 21	27
Drained flashing joint at floor level	Figure 22	28
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Meter box at jamb	Figure 28	32
Meter box at head	Figure 29	32
Enclosed deck	Figure 30	33
Pipe penetration	Figure 31	34
Cladding installed	Figure 32	35
Garage head	Figure 33	36
Garage jamb	Figure 34	36

Figure 1: Framing set out

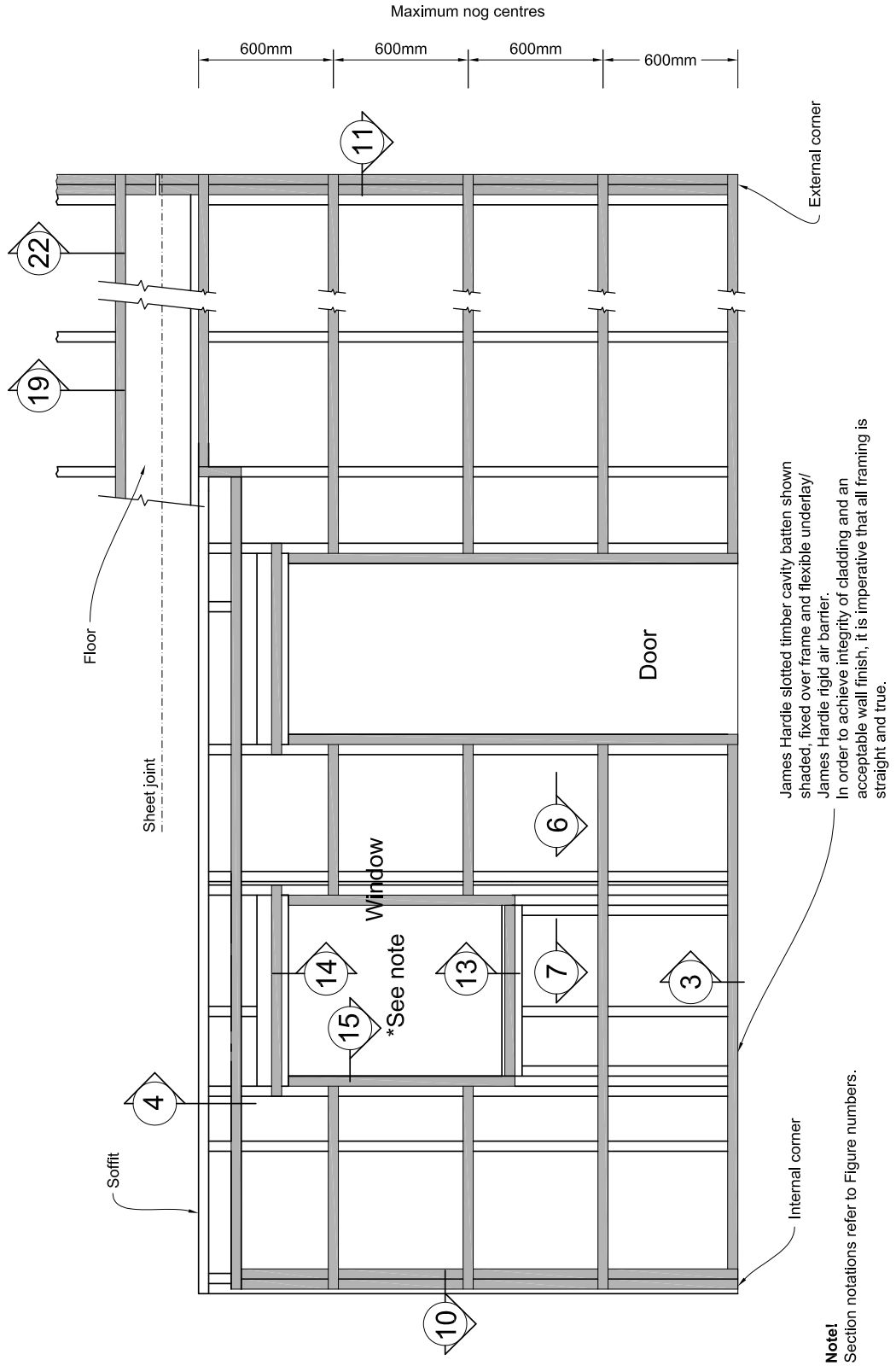
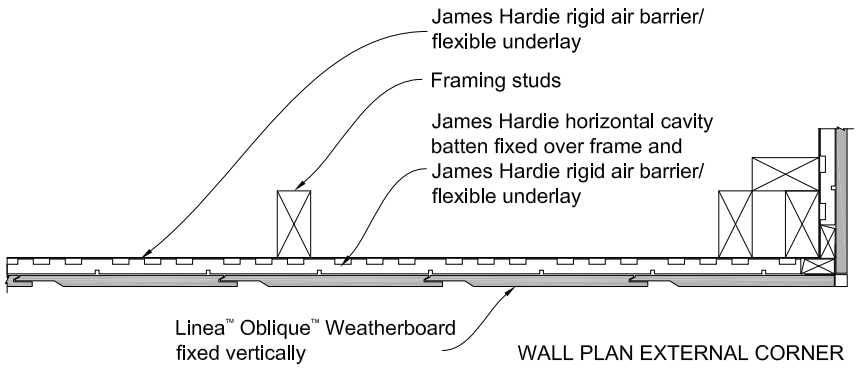
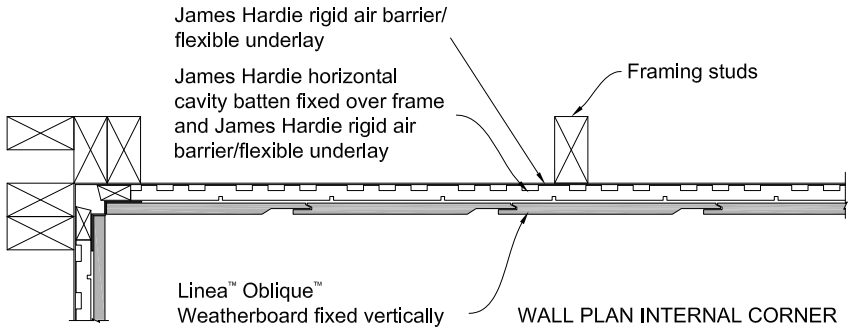


Figure 2: Cladding and James Hardie horizontal batten setout





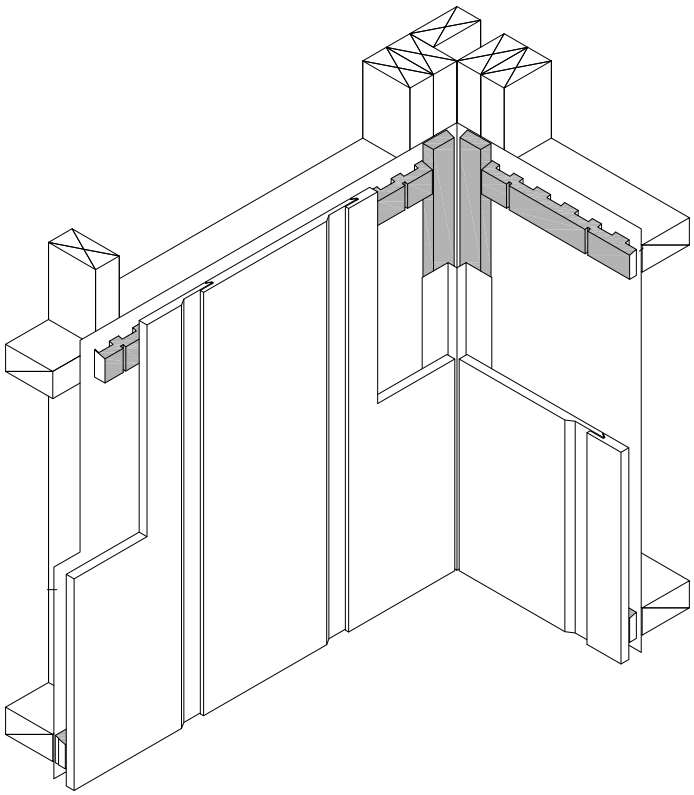


Figure 3: Ground clearance

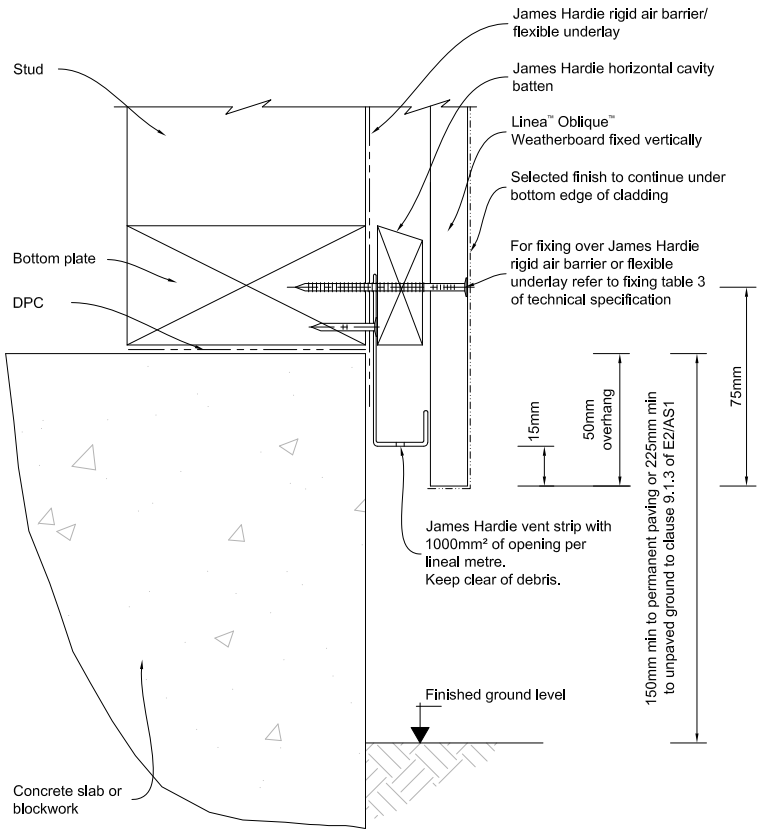


Figure 4: Soffit detail

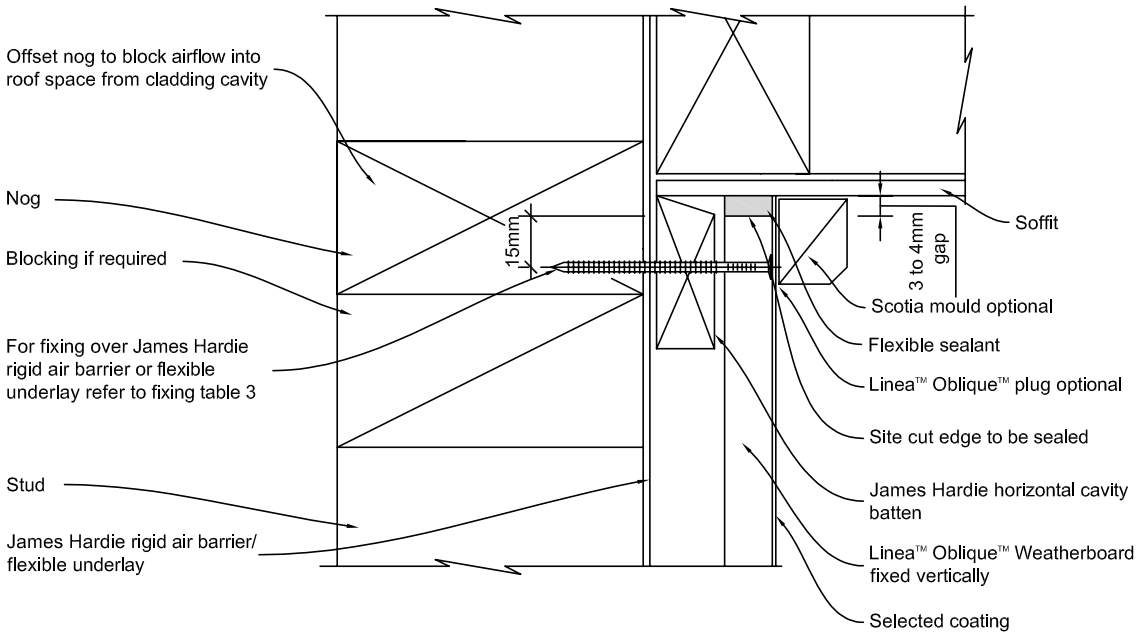


Figure 5: No soffit detail

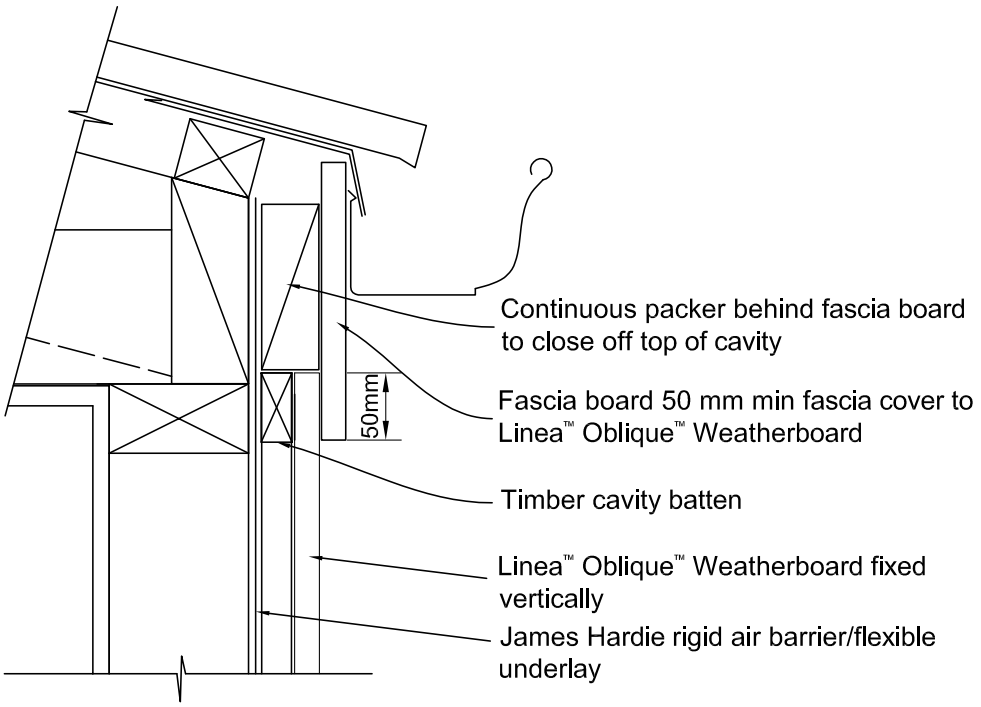


Figure 6: Vertical joint 200mm weatherboard width up to VH wind zone

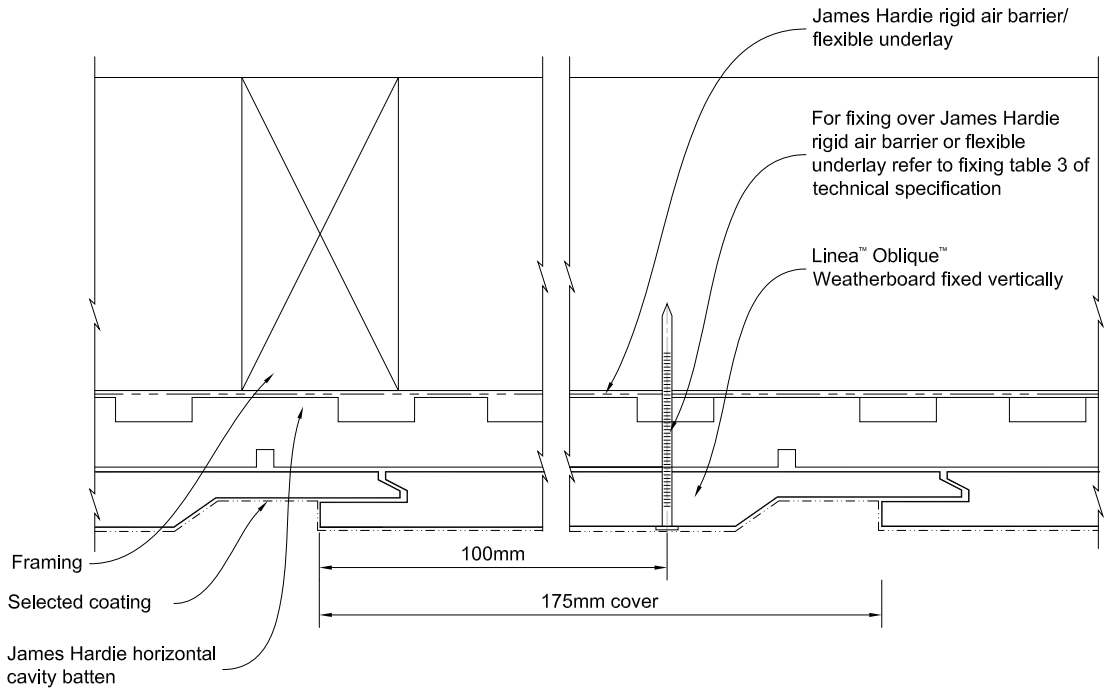


Figure 7: Vertical joint 300mm weatherboard width up to VH wind zone

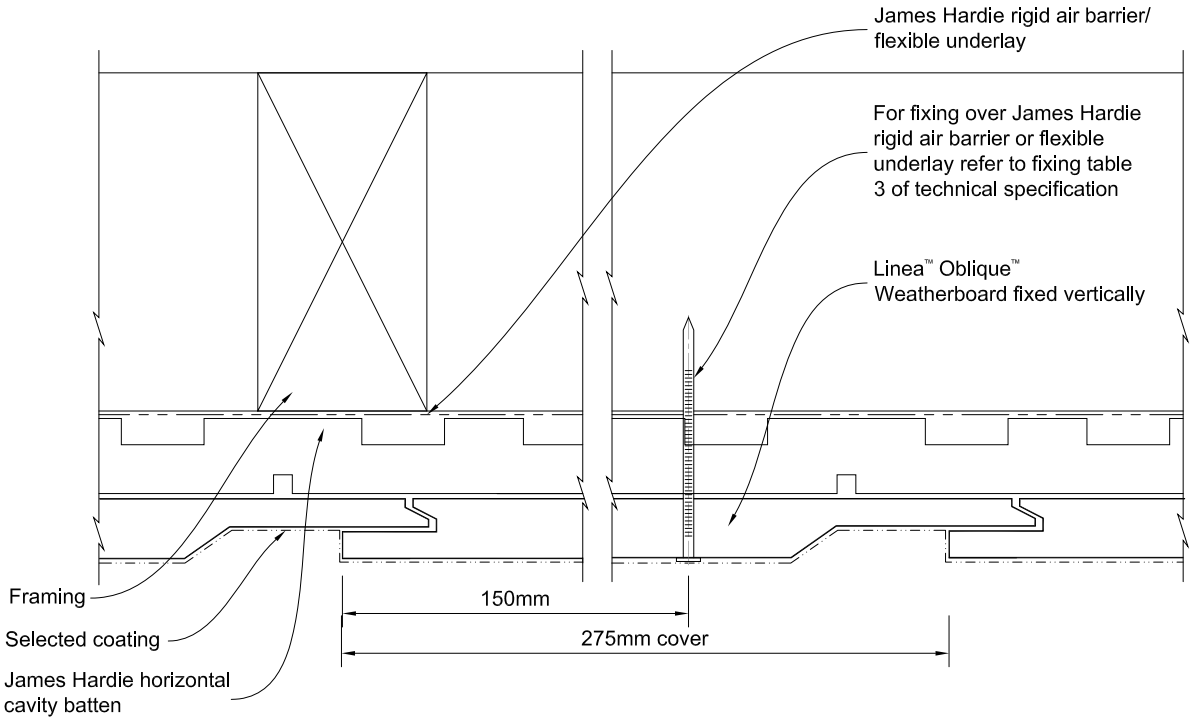


Figure 8: Vertical joint 200mm weatherboard width EH wind zone and SED

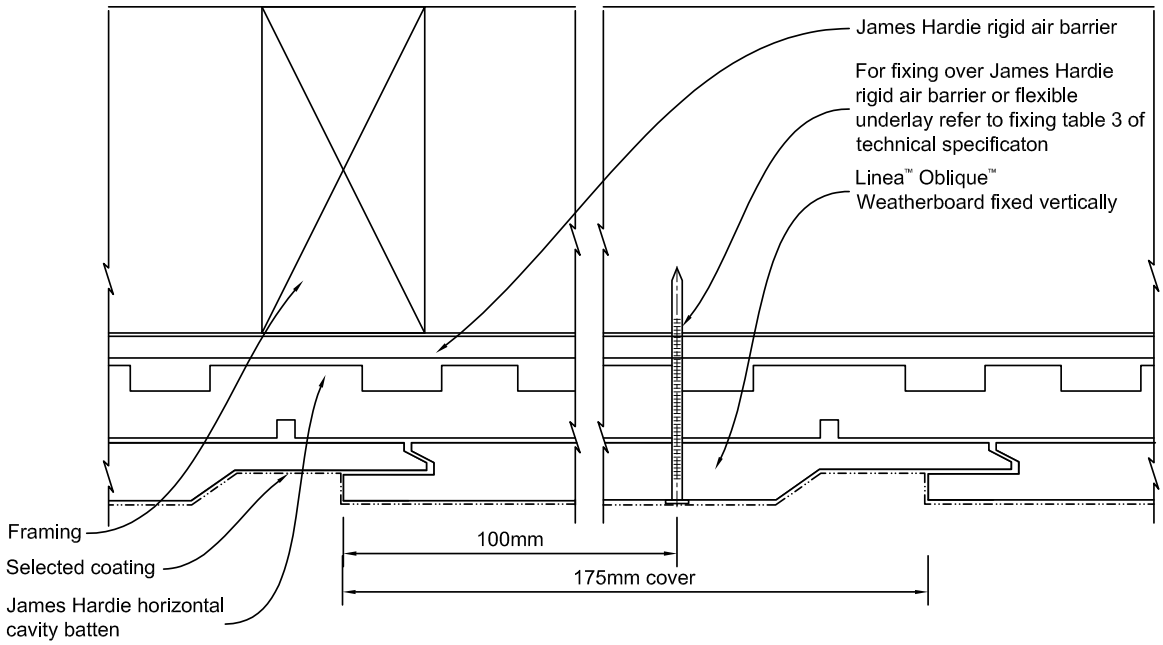


Figure 9: Vertical joint 300mm weatherboard width EH wind zone and SED

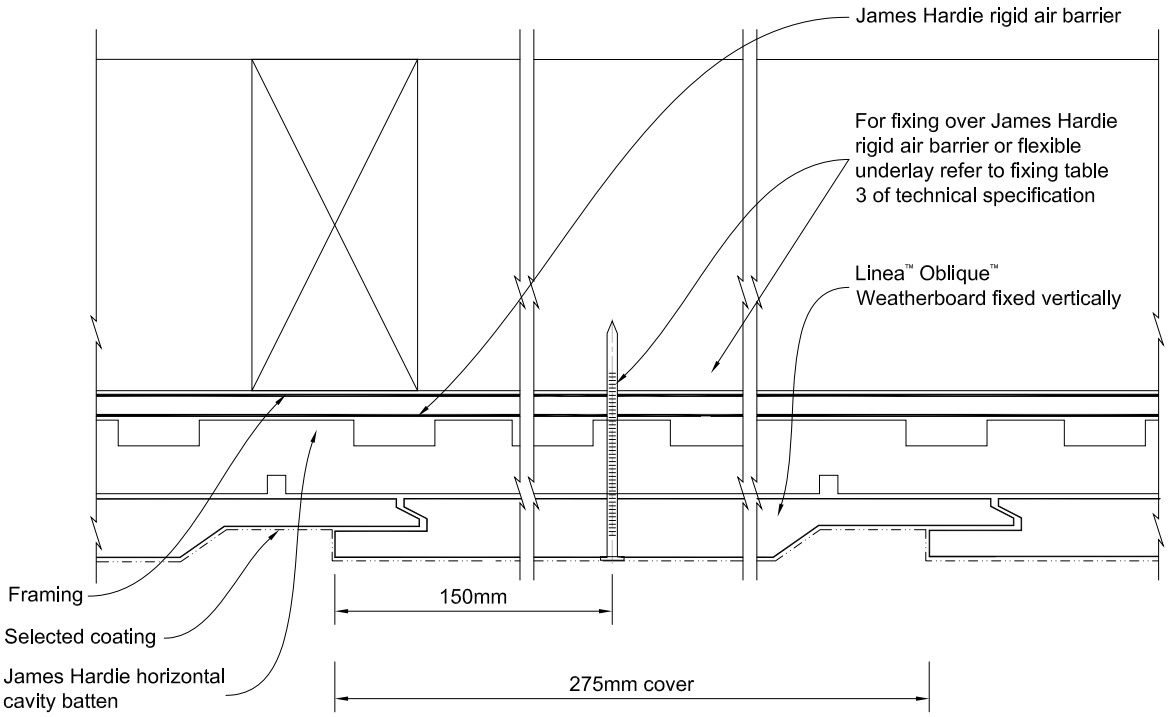


Figure 10: Internal corner

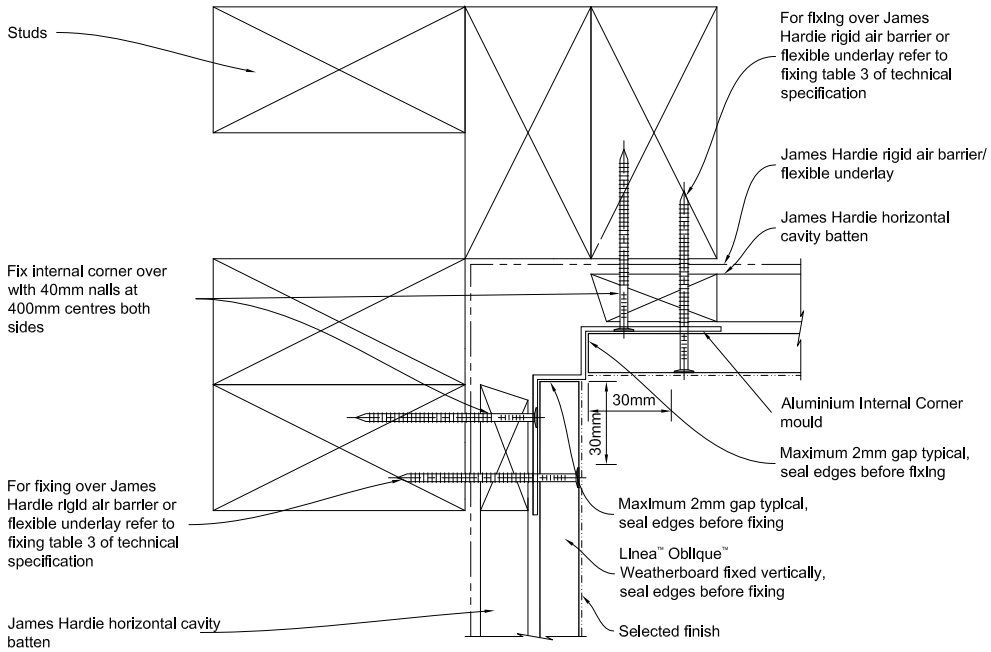


Figure 11: External aluminium box corner

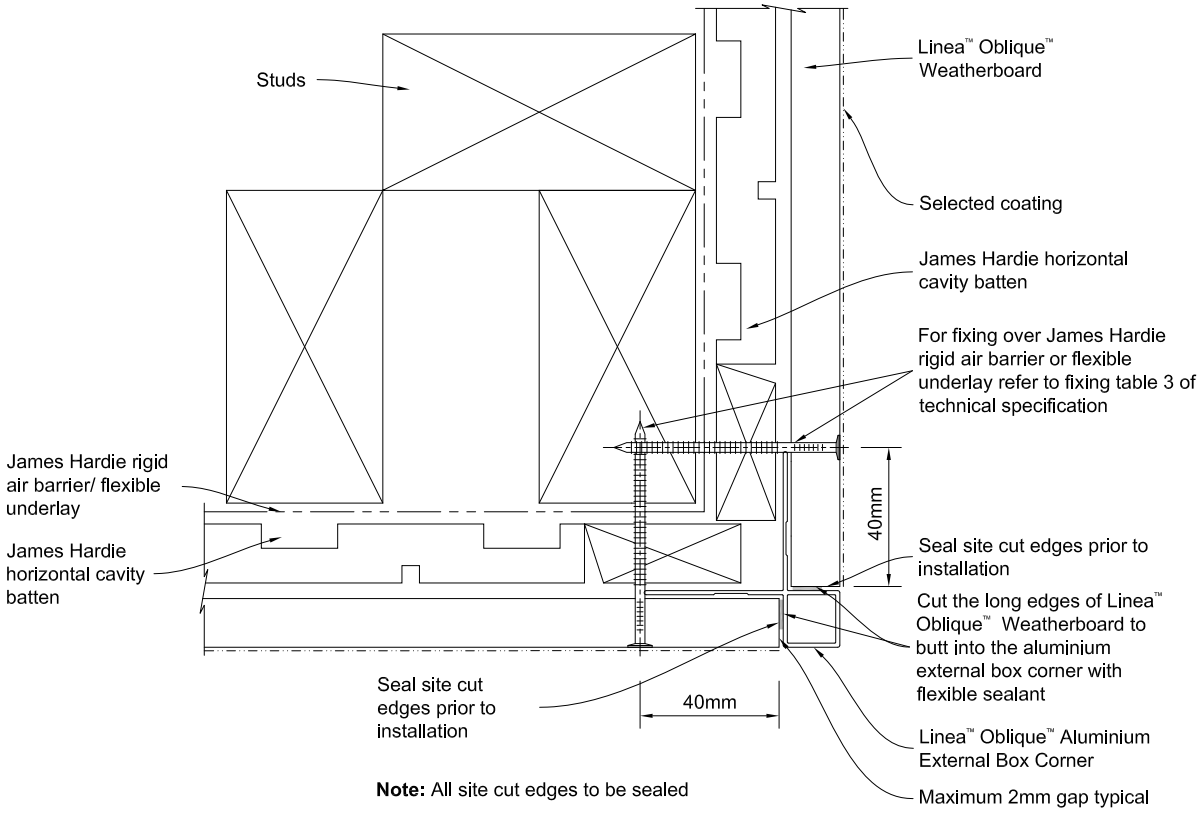


Figure 12: External box corner

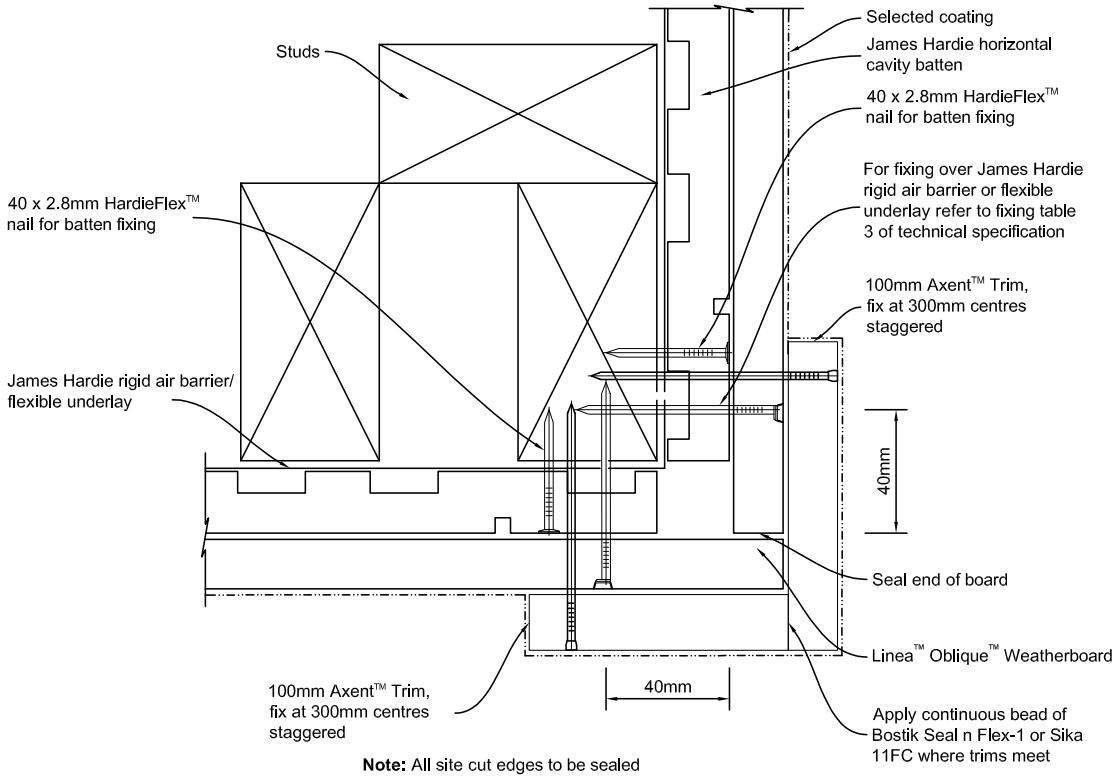
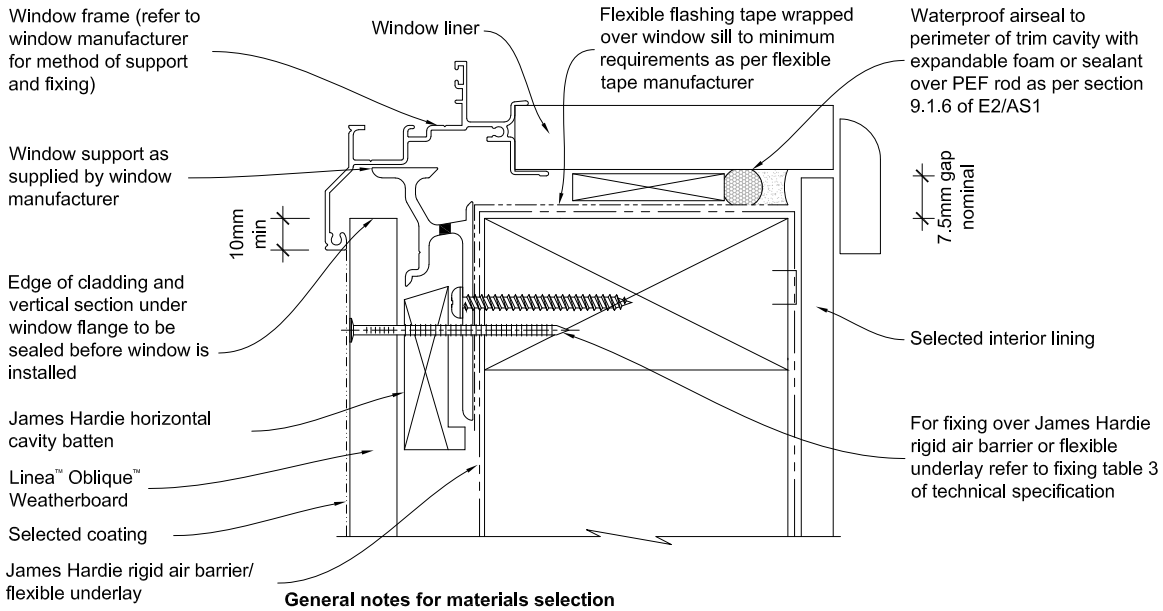


Figure 13: Window sill

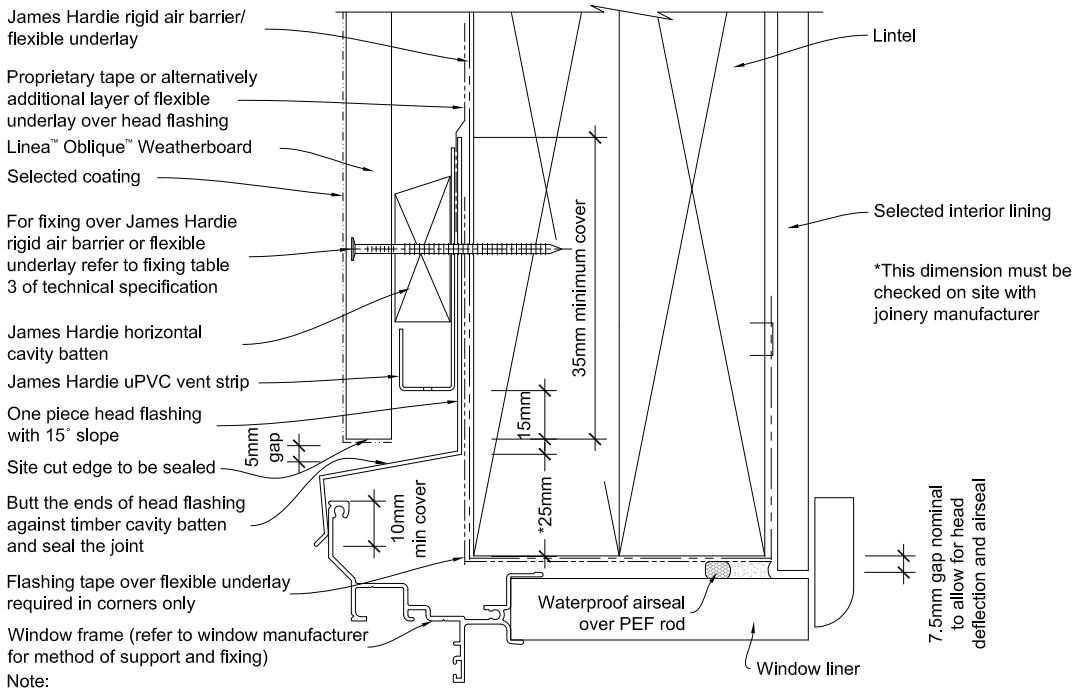


General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. When James Hardie rigid air barriers are used flashing tape to be applied to the entire opening

Refer to the manufacturer or supplier for technical information for these materials.

Figure 14: Window head



Note:

- When James Hardie rigid air barriers are used flashing tape to be applied to the entire window opening
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED projects
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1

Figure 15: Window jamb

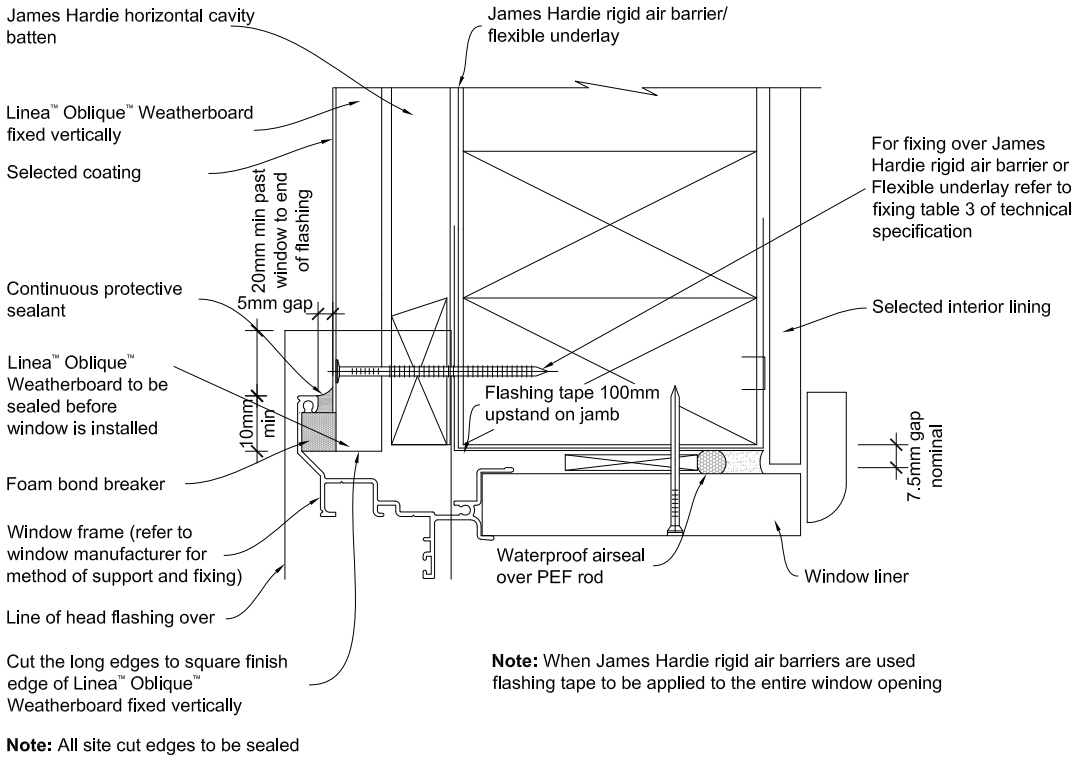


Figure 16: Window jamb flashing

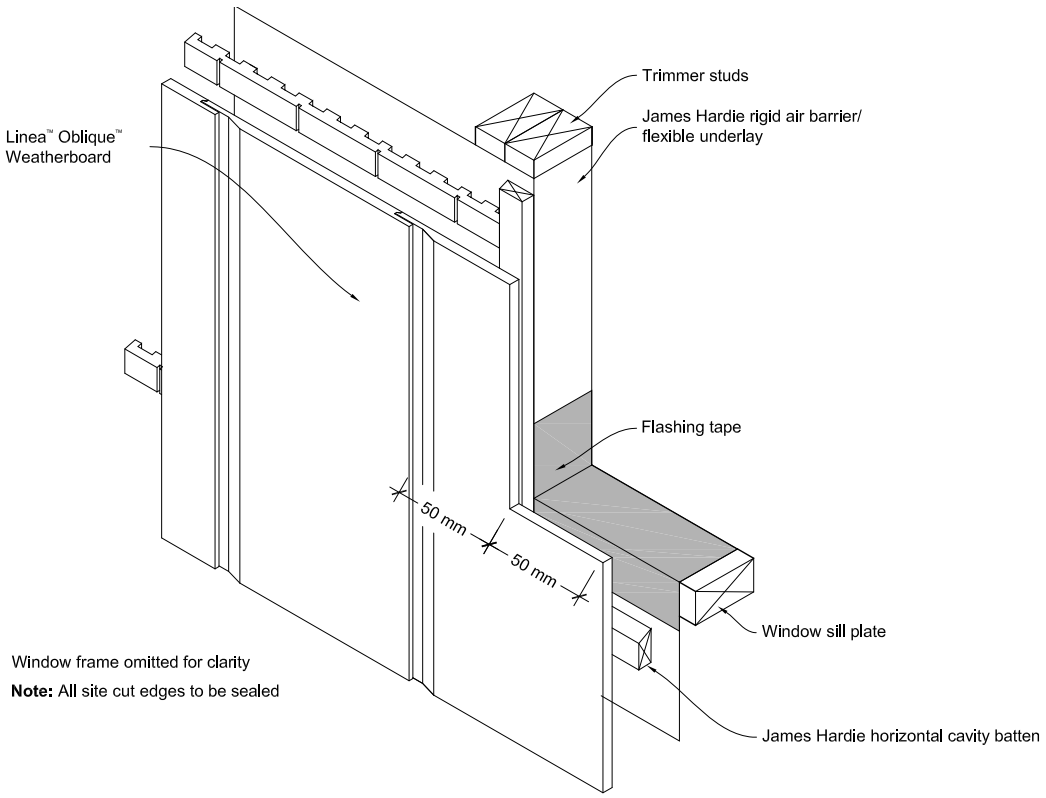


Figure 17: Over joist at floor level

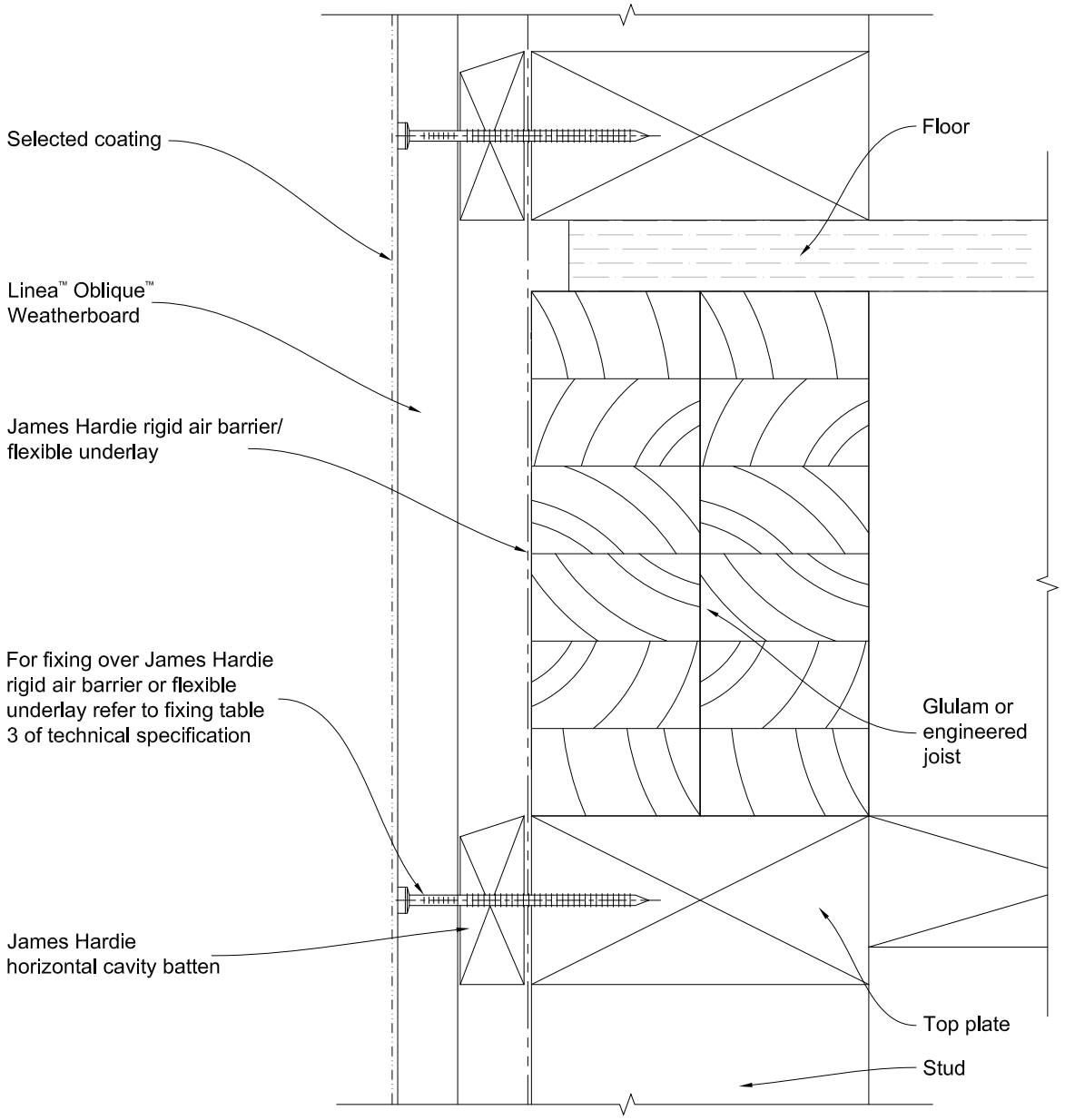


Figure 18: Butt jointing of Vertical Linea Oblique Weatherboard

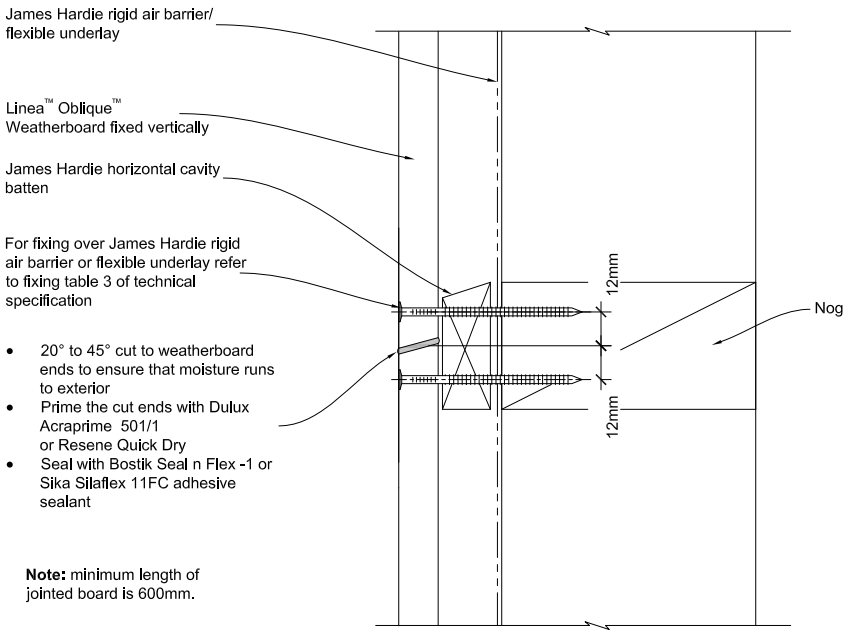
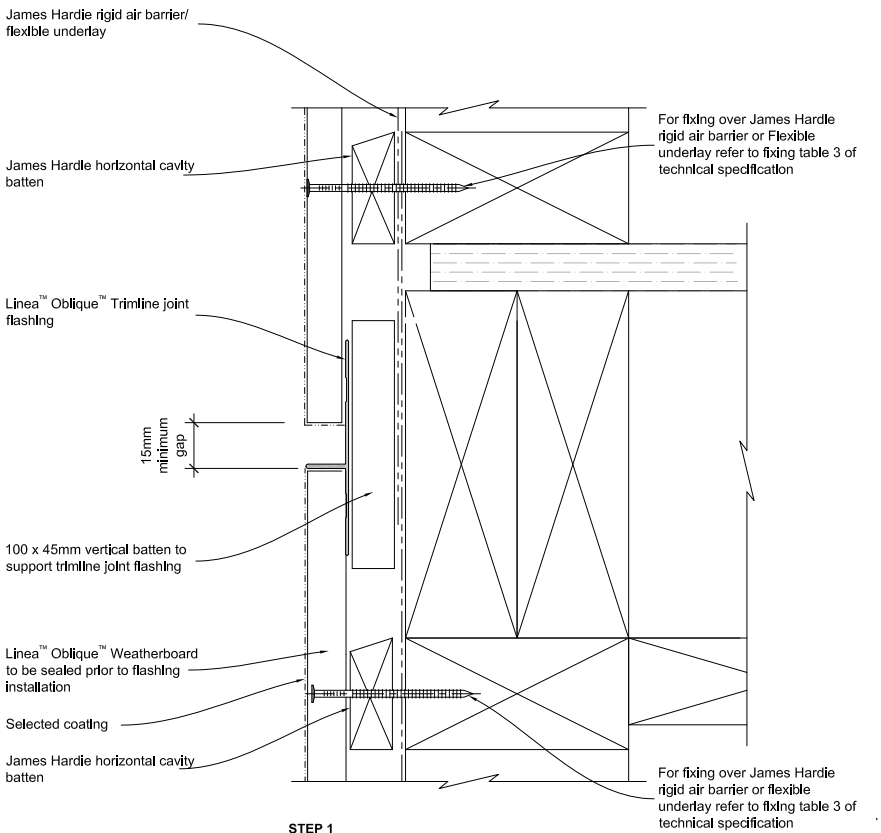


Figure 19: Trimline flashing joint at floor level



STEP 1

STEP 1

- Ensure flat James Hardie rigid air barrier / Flexible underlay is in place.

STEP 2

- James Hardie horizontal cavity batten to be installed over the studs and nogs. - Nylon strapping intermediate support to hold insulation in place between studs.

STEP 3

- Install the lower weatherboards with aluminium trimline flashing.
- Install the upper weatherboard keeping a 15mm gap.

Notes:

- The aluminium trimline flashing is installed prior to weatherboard. Apply two 6mm thick lines of adhesive sealant on the bottom portion of aluminium trimline flashing to seal. Take care to ensure continuous seal is formed between weatherboard and aluminium trimline flashing.
- The sealant must continue between flashing flange and weatherboard edge.
- Install purpose-made jointer 50mm over each end of trimline flashing and seal with flexible sealant to prevent water ingress.

Figure 20: Trimline flashing joint external corner

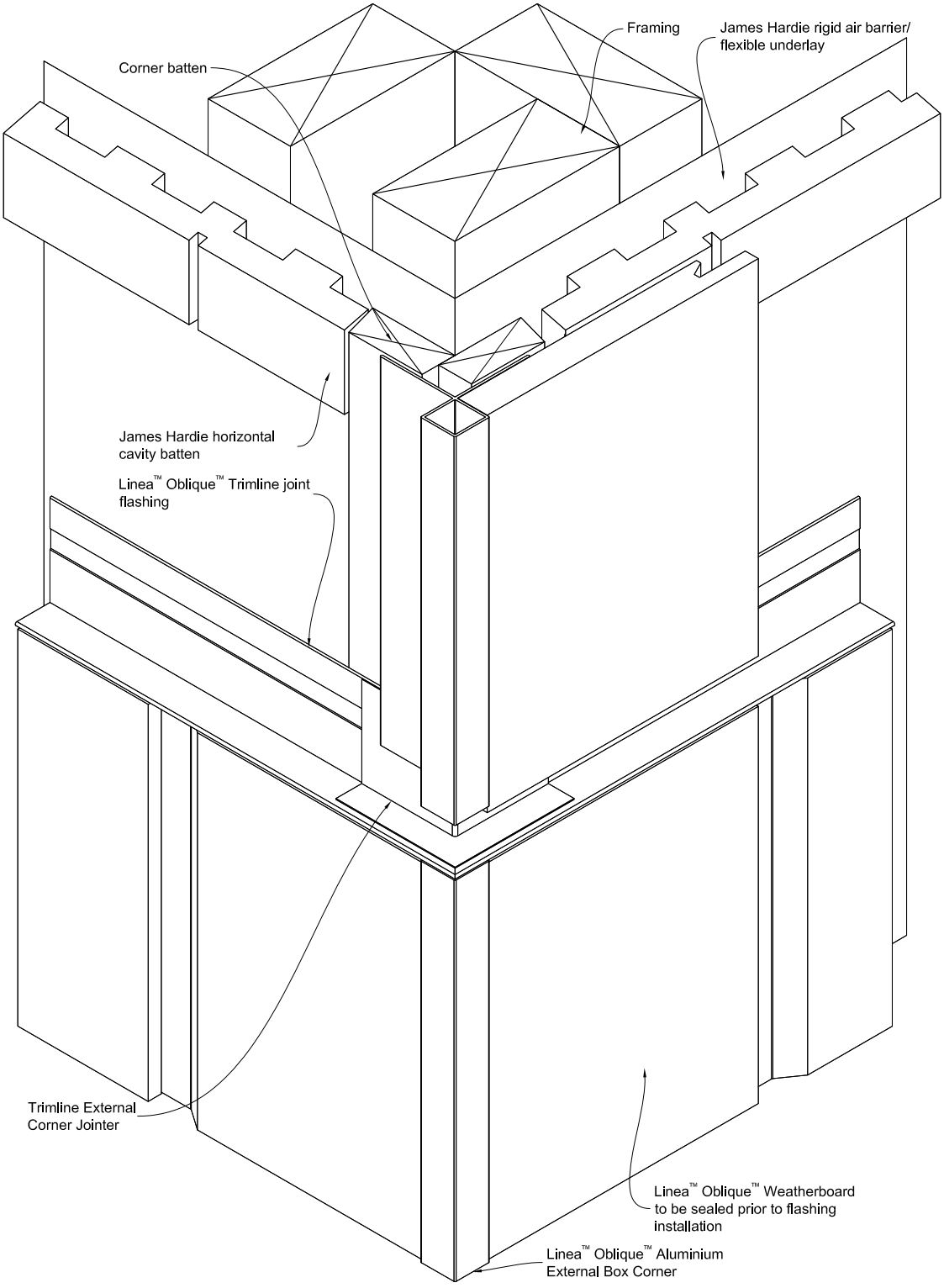


Figure 21: Trimline joint

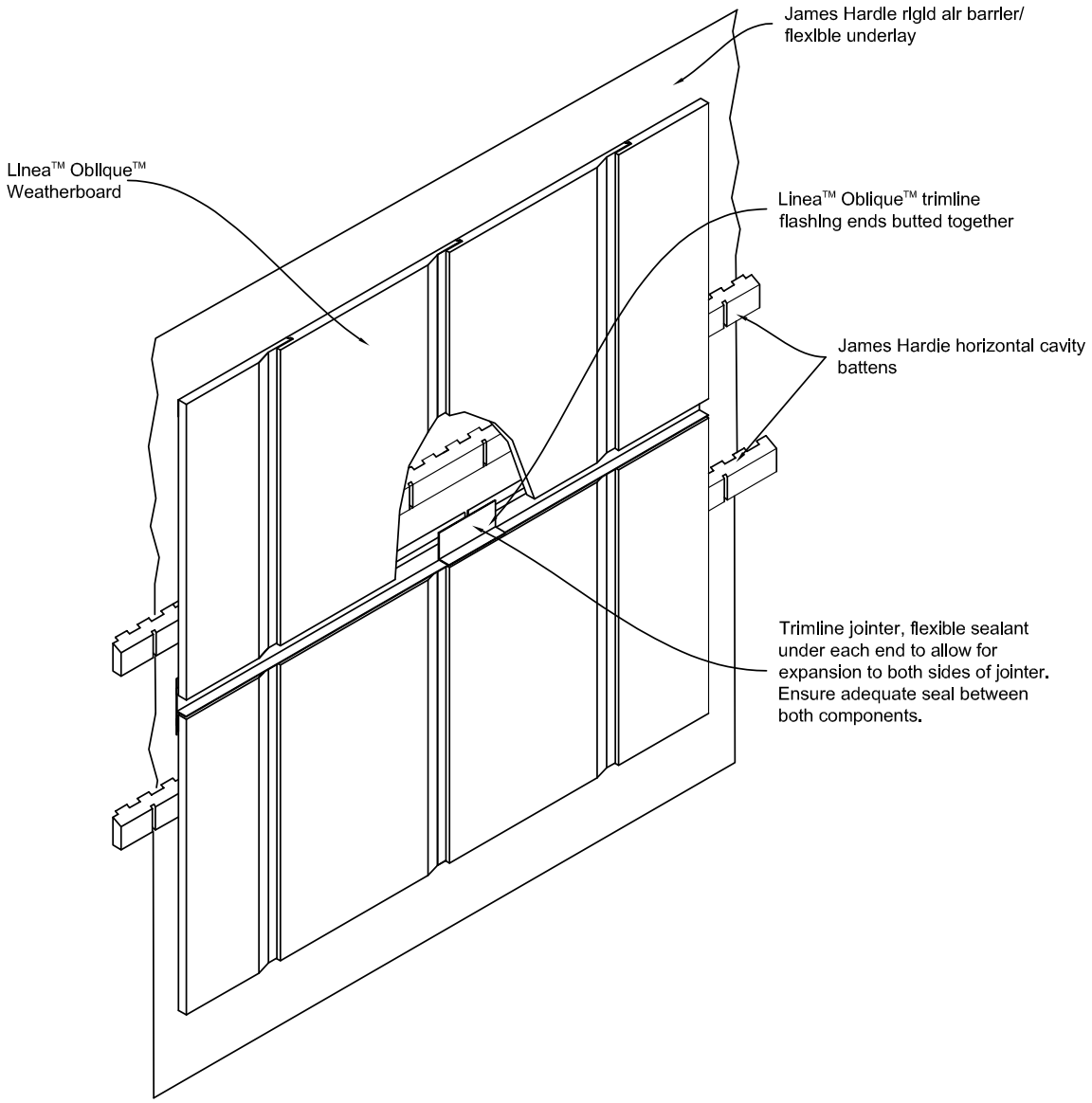
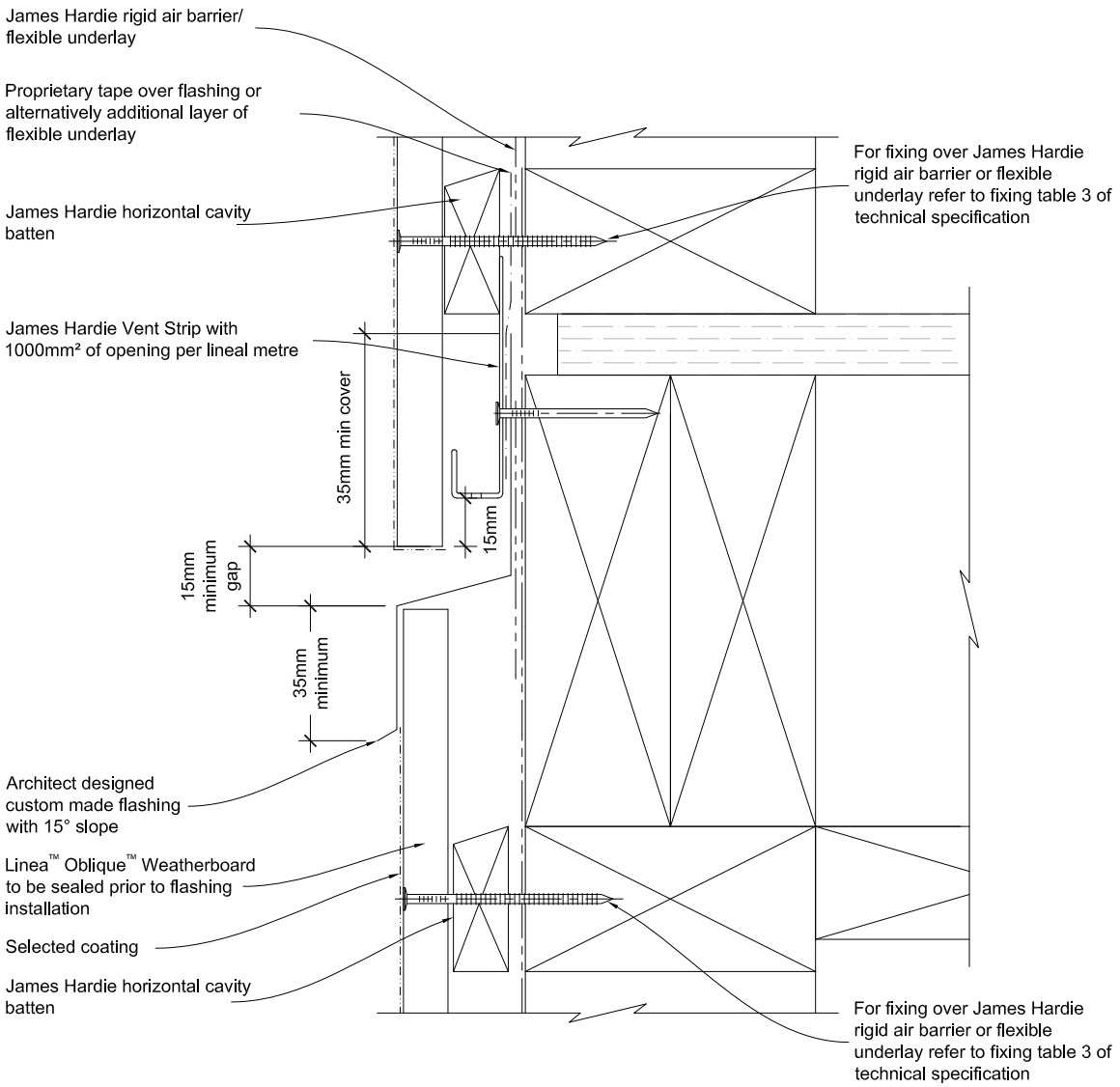


Figure 22: Drained flashing joint at floor level



Note:
This detail is required to limit cavities to a maximum of 2 stories or 7 metres
Refer to E2/AS1 clause 9.1.9.4

STEP 1

- Check architect's plans for the type of flashing to be used

STEP 2

- Check fixing centres and edge distances
- If top fixings are to be hidden by the Z flashing they will need to be fixed and sealed before the Z flashing is installed
- Cut edges need to be primed with Acraprime sealer or similar

STEP 3

- When 50 year durability is required refer Table 20 E2/AS1

STEP 4

- The flashing to be placed in the centre of the floor joists. Do not fix James Hardie horizontal cavity batten or cladding into floor joists

Figure 23: Drained flashing joint at floor joist

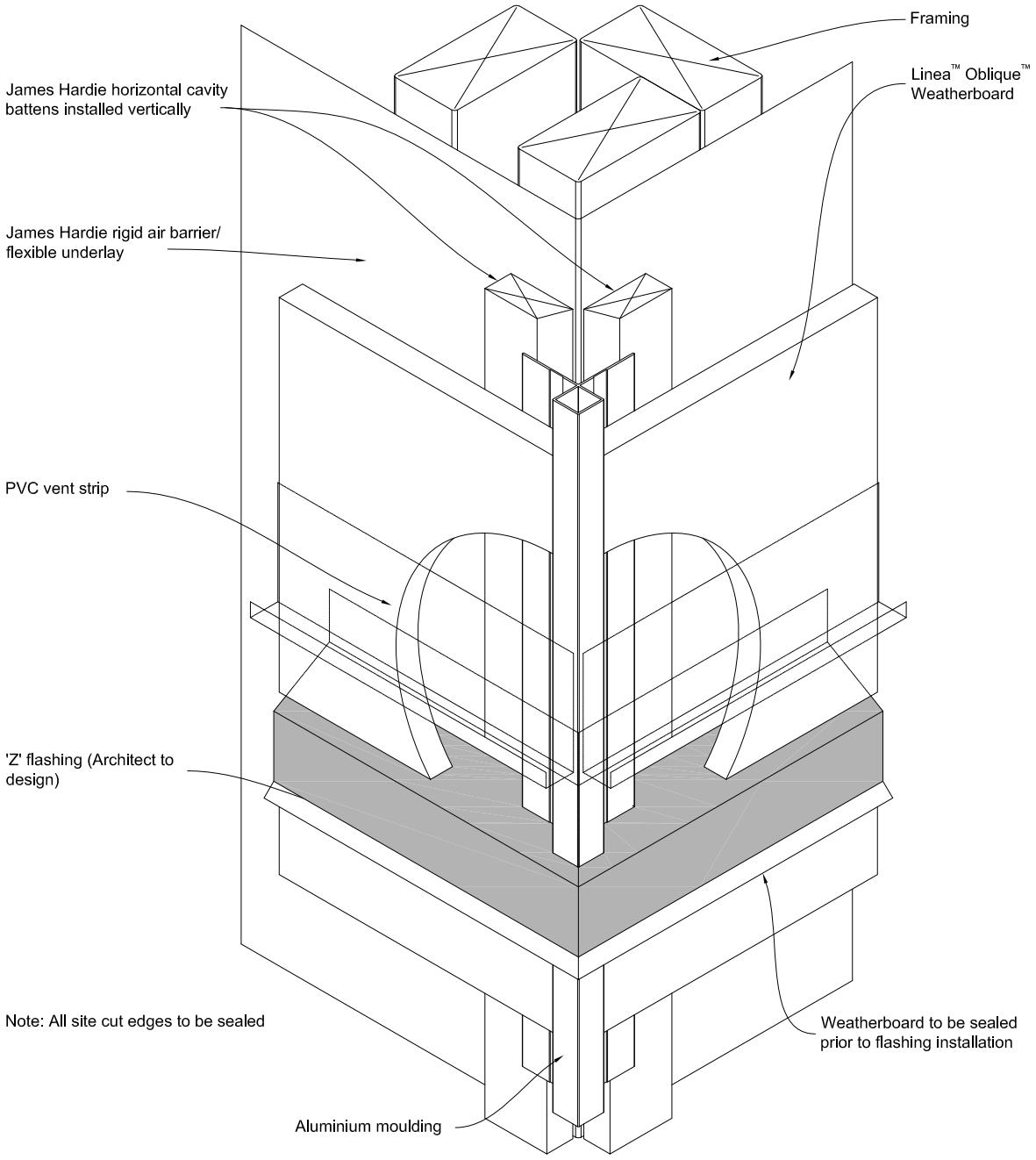


Figure 24: Apron flashing detail

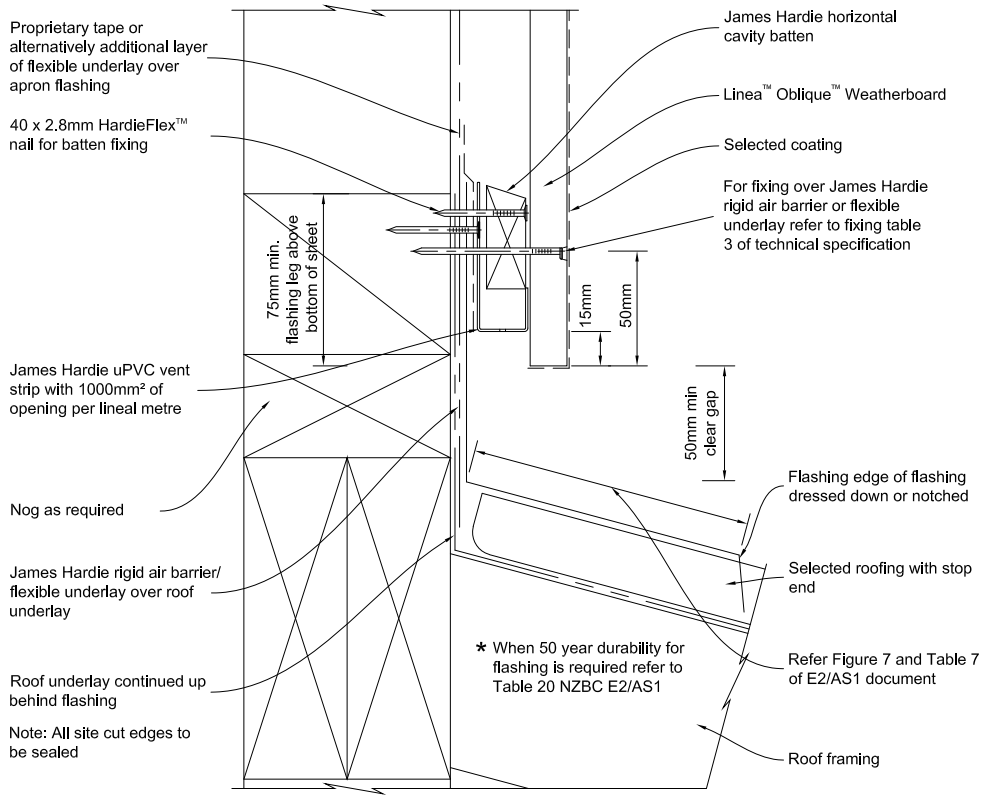


Figure 25: Parapet flashing

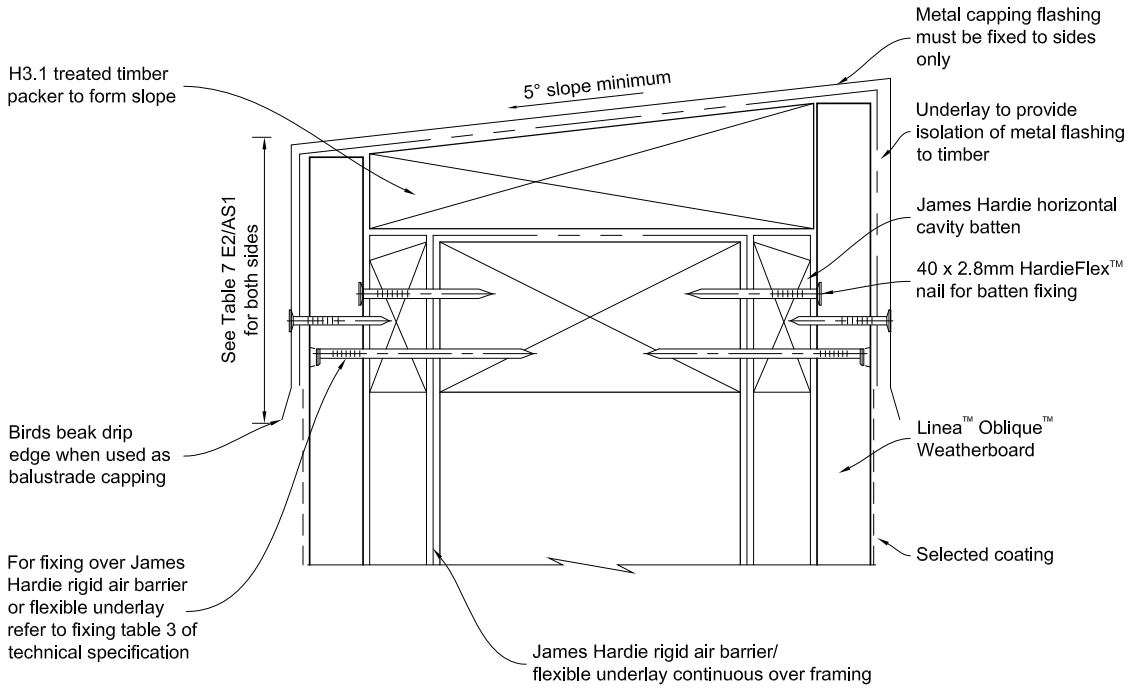


Figure 26: Roof to wall junction detail

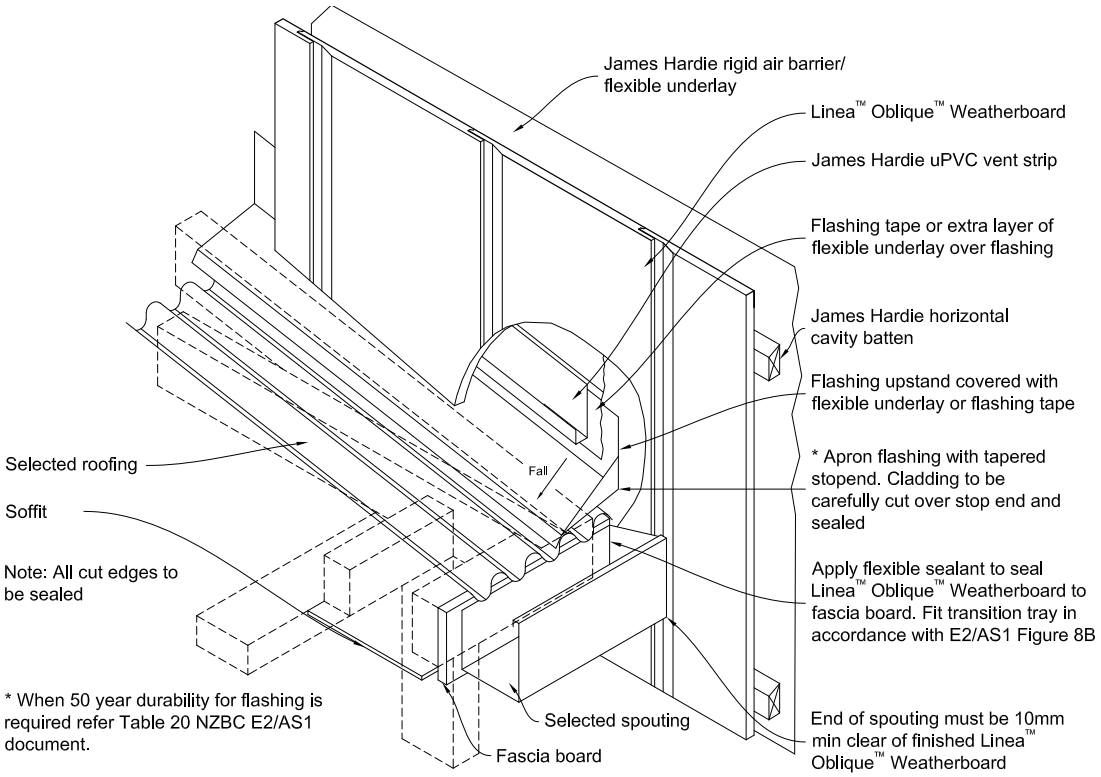


Figure 27: Meter box at sill

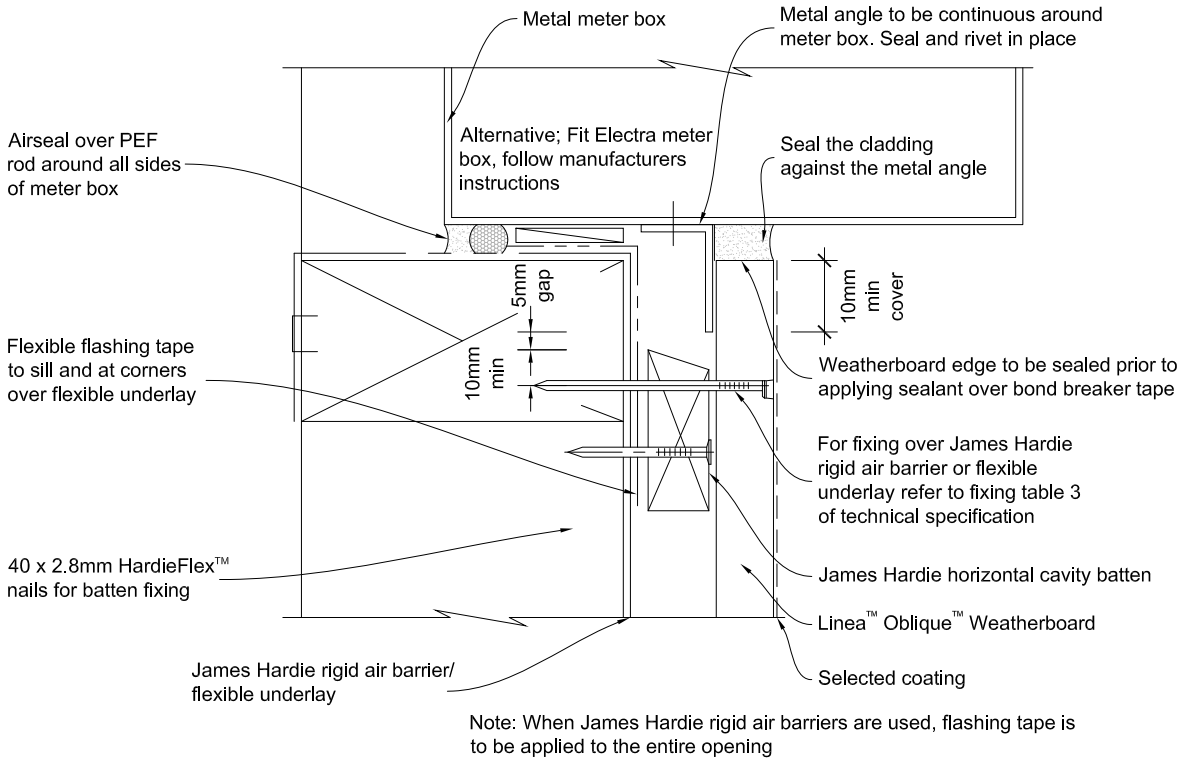


Figure 28: Meter box at jamb

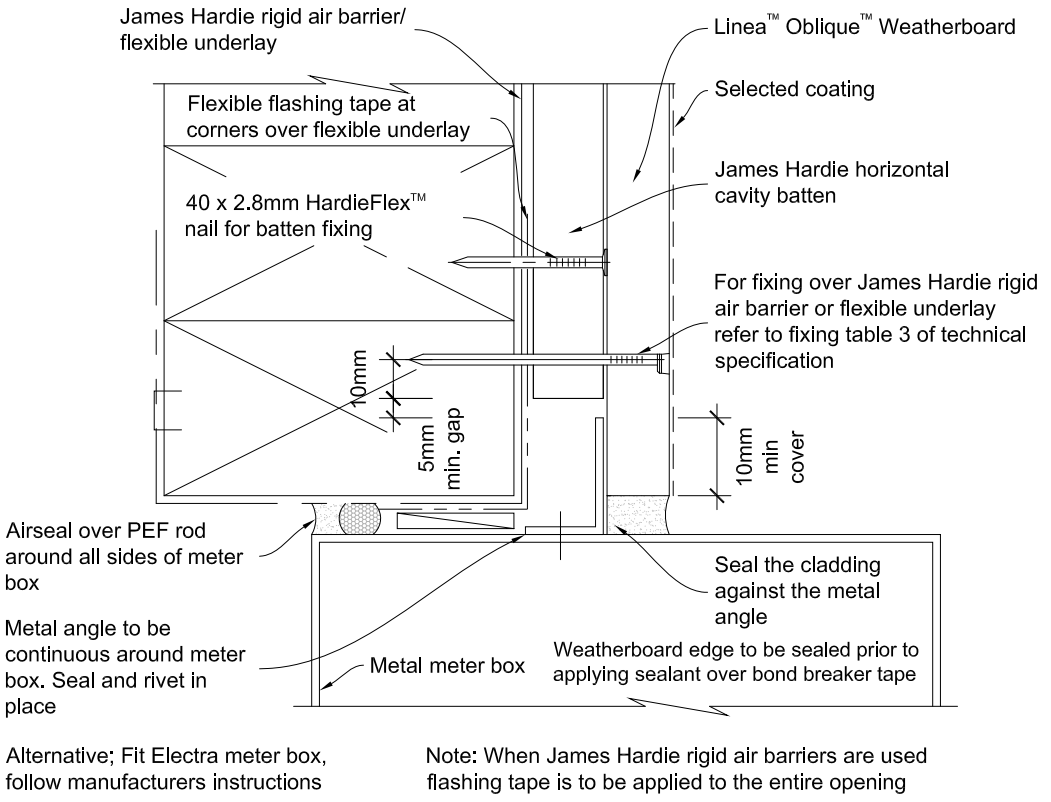
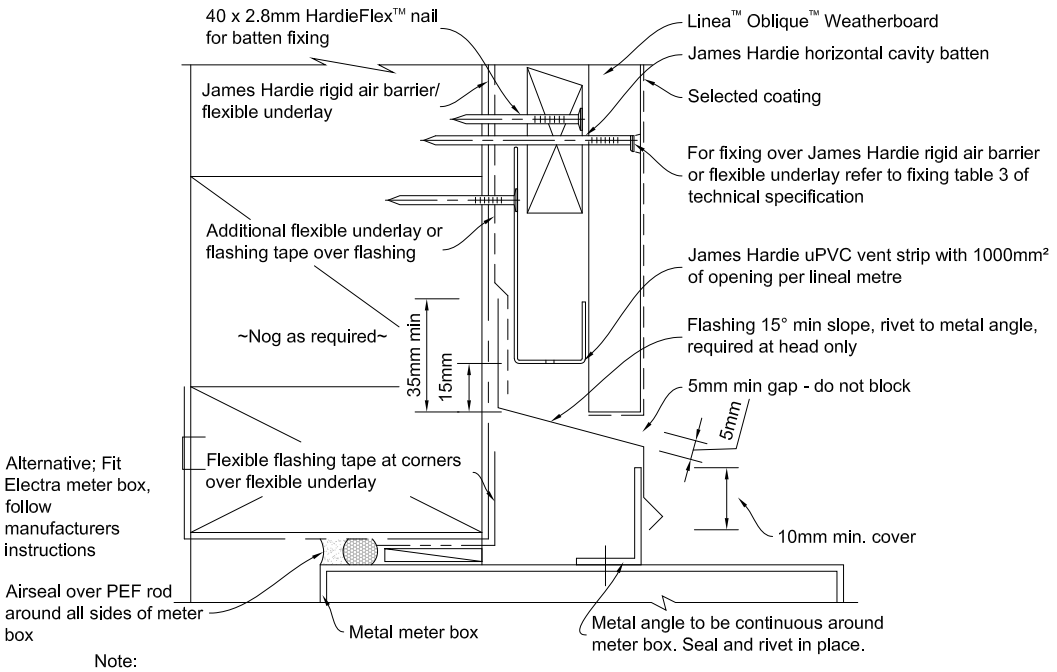


Figure 29: Meter box at head



Note:

- When James Hardie rigid air barriers are used flashing tape is to be applied to the entire opening.
- Sealant must be installed between head flashing and flange in VH and EH wind zones and SED projects.
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- All site cut edges to be sealed

Figure 30: Enclosed deck

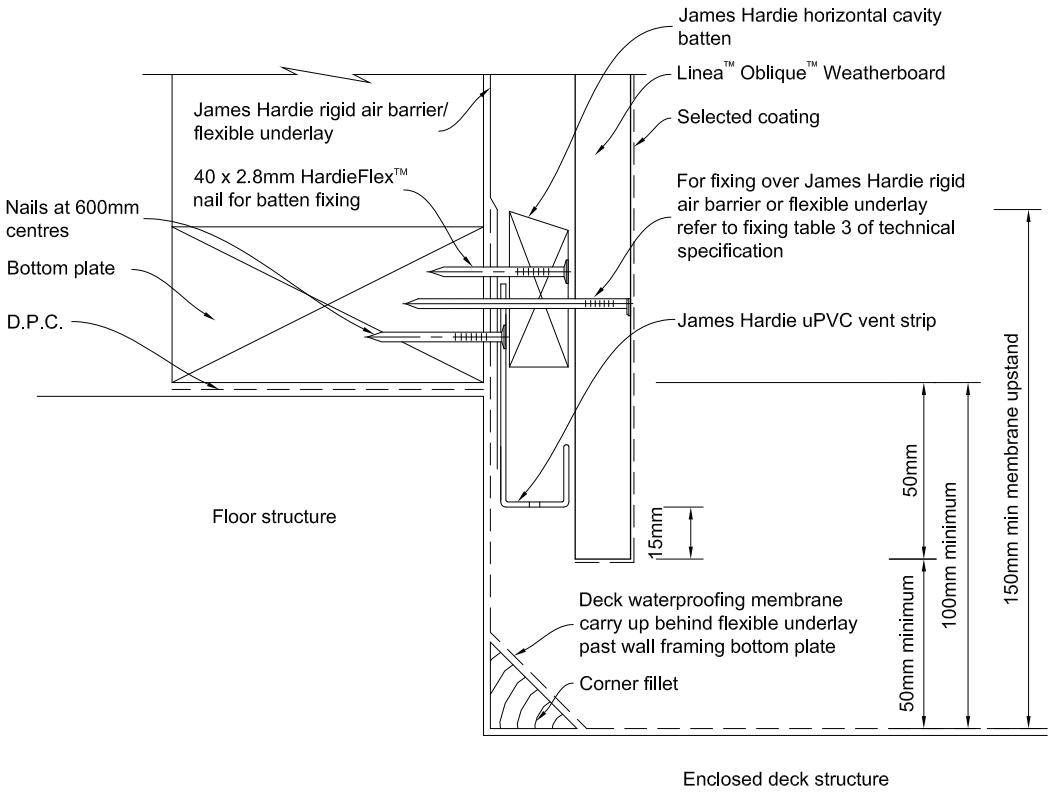


Figure 31: Pipe penetration

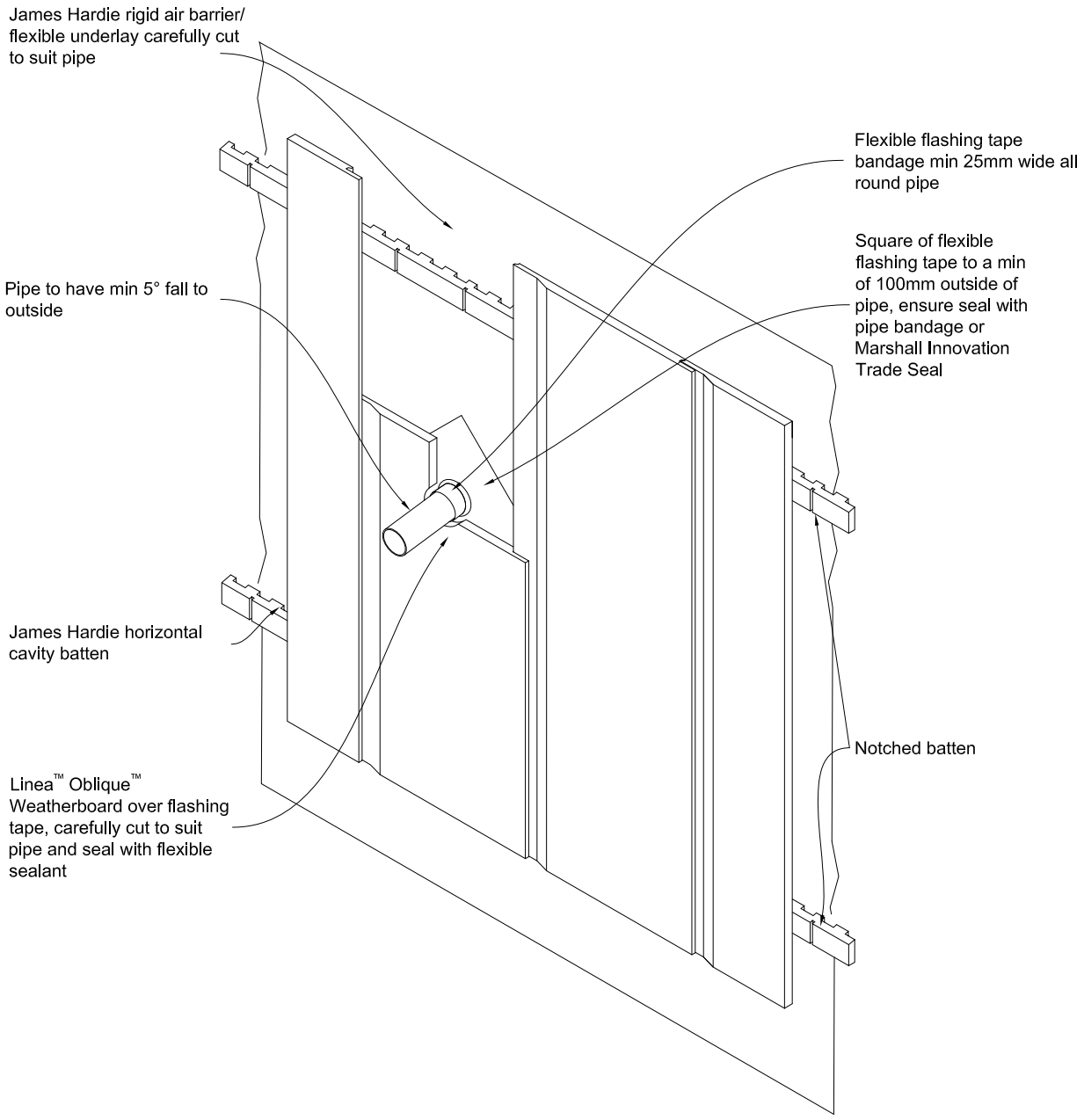


Figure 32: Cladding installed

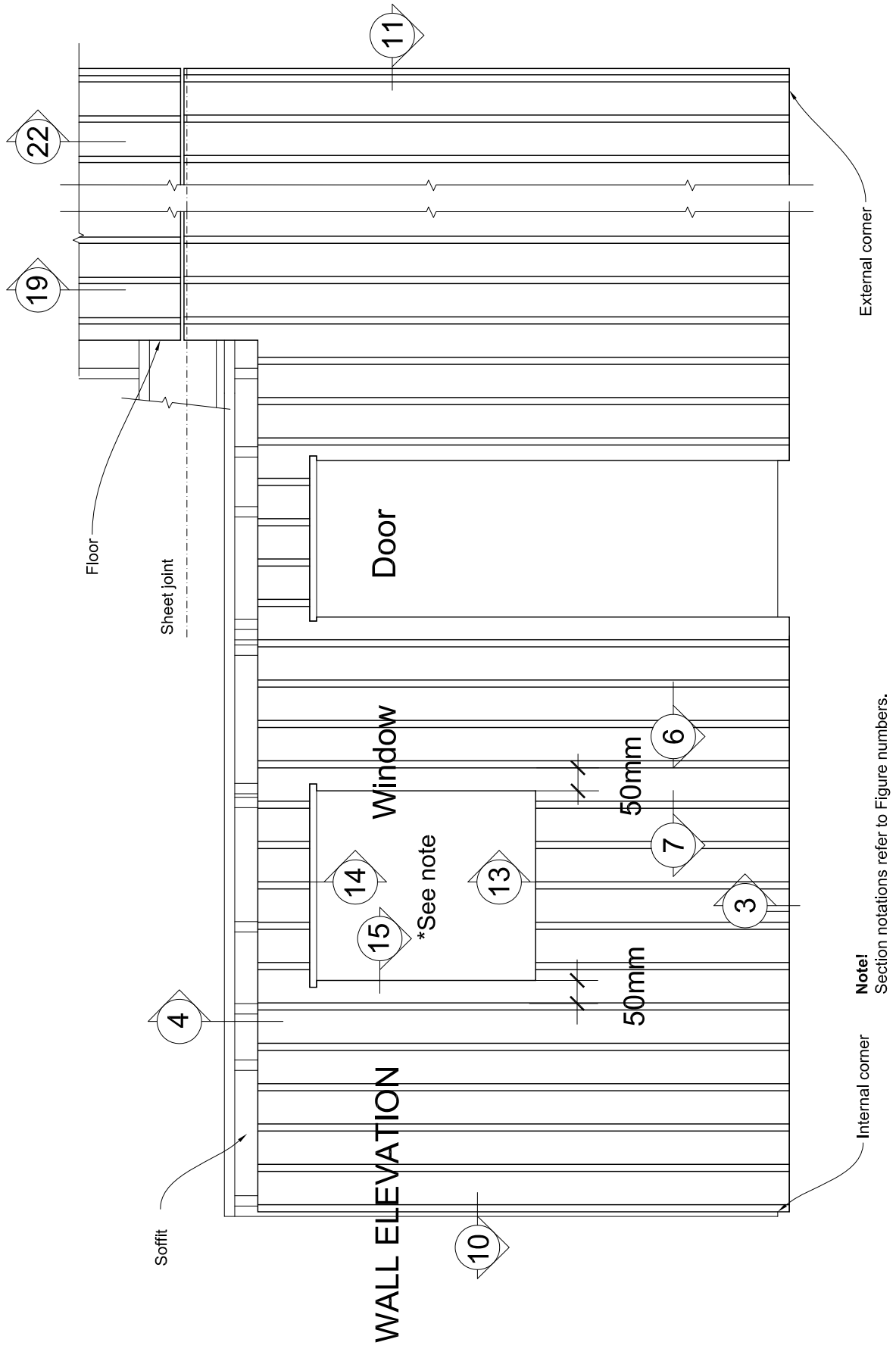


Figure 33: Garage head

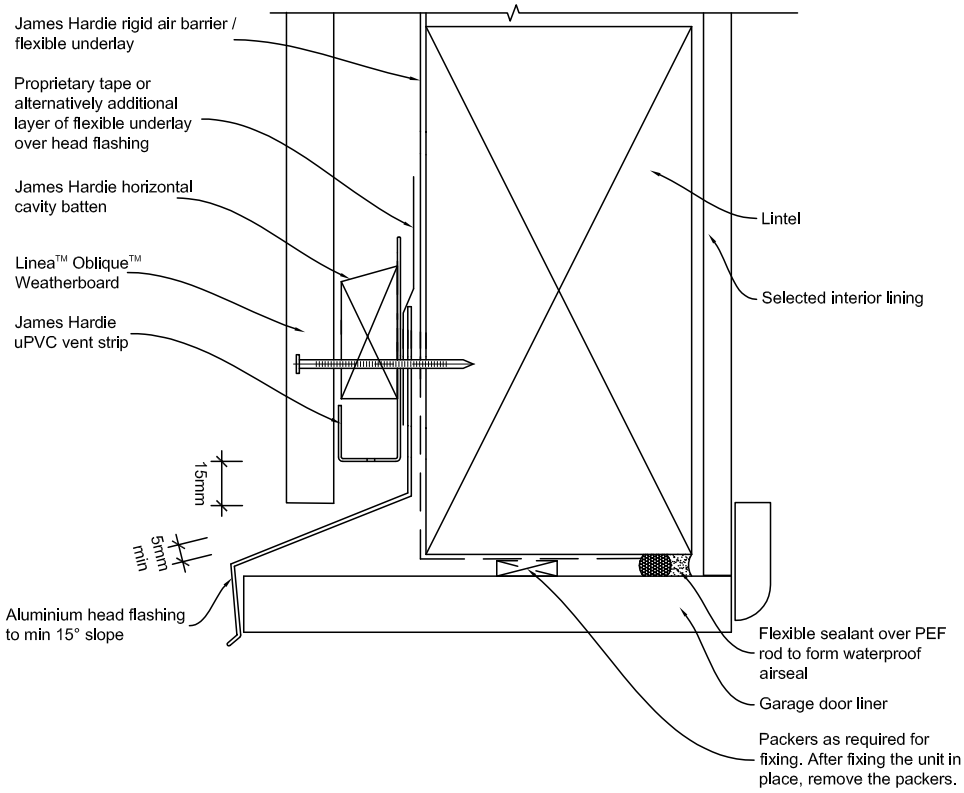
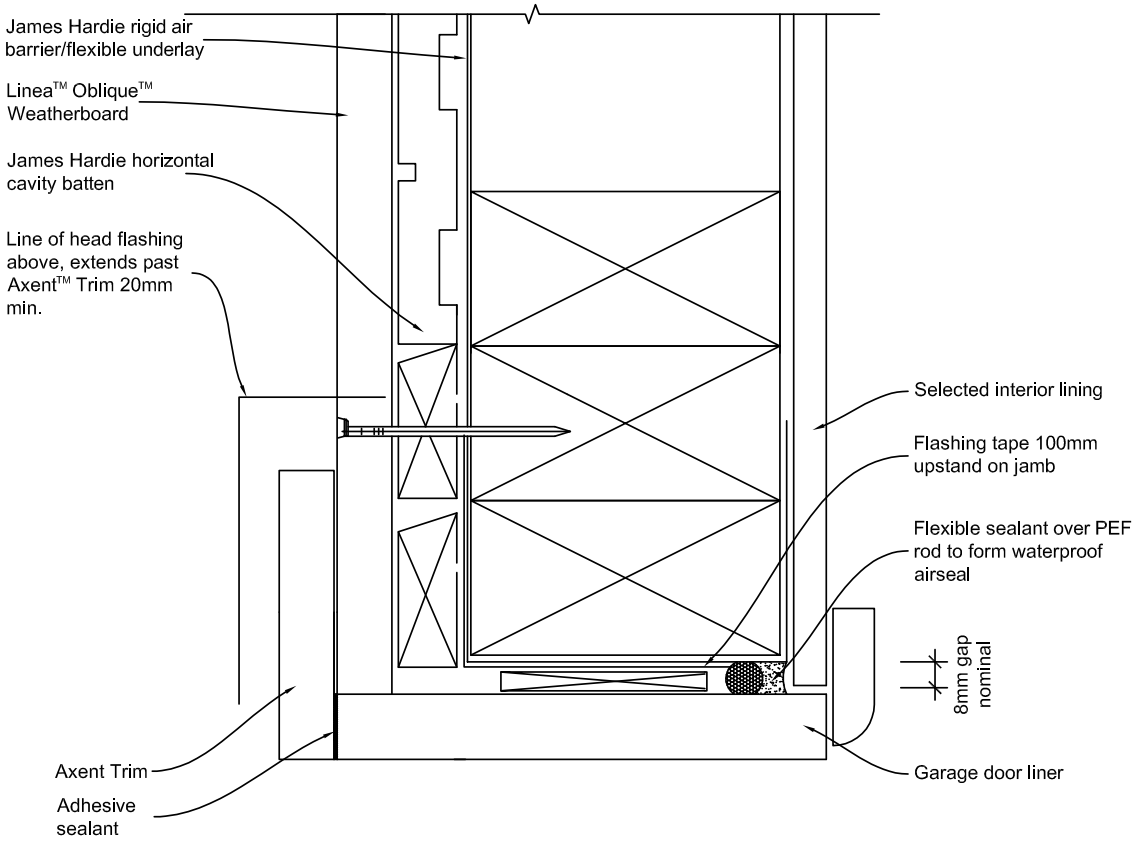


Figure 34: Garage jamb



Notes

Notes

Product Warranty

Linea™ Oblique™ WEATHERBOARD

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Oblique™ Weatherboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation;

b) this warranty is not transferable;

c) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice;

d) the project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards;

e) the claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product;

f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces);

g) all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;

h) if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. Linea™ Oblique™ Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with the Linea™ Oblique™ Weatherboard Vertical Installation technical specification. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

James Hardie

Ask James Hardie™ | Call 0800 808 868 | jameshardie.co.nz

WET WALL LINING

CBI 5113

March 2007

GIB Aqualine®
Wet Area Systems

www.gib.co.nz

Introduction

MARCH 2007

THIS PUBLICATION

This publication is not intended as the definitive guide on wet area construction and wet area systems, but rather as a helpful guide to best practice around areas where there is intermittent water exposure and splash zones within residential and non-residential buildings – in particular, areas covered by the New Zealand Building Code (NZBC), Clause E3 Internal Moisture.

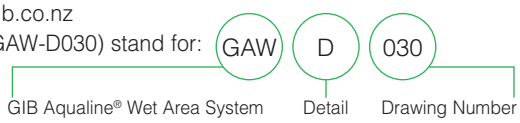
The information herein is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZBC and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

It is important to introduce materials and systems which have been specially designed to cope with the conditions that are common in wet areas, and to ensure they are installed correctly, using best practice, and are compatible to form a complete wet area system.

The code numbers shown with each "typical detail", e.g. GAW-D030, match the code numbers for drawings available as downloads on the GIB® website at www.gib.co.nz

The reference numbers (e.g. GAW-D030) stand for:



WHAT IS A WET AREA?

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Wet areas fall into two categories; these are well explained and documented in the NZBC, Clause E3.

1. Water splash areas – These are areas subject to intermittent splash of liquid water around sanitary fittings and appliances such as baths, vanities, laundry tubs, sinks, etc. These areas are required to have an impervious, easily cleaned surface.
2. Shower enclosures – These are areas subject to more frequent, larger quantities of water, and include shower enclosures and shower over bath areas. The NZBC E3/AS1 requires these areas to be impervious, and specifically excludes any paint and wallpaper finishes. Where ceramic tile or stone finishes are applied, E3/AS1 requires that they "shall be laid on a continuous impervious substrate or membrane".

The requirements of these wet areas are described on page 6 of this publication and in full in Clause E3 of the NZBC. Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management, which will require separate consideration. Ongoing maintenance of wet areas is also important to maximise the life of the wet area.

GIB AQUALINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or moisture.

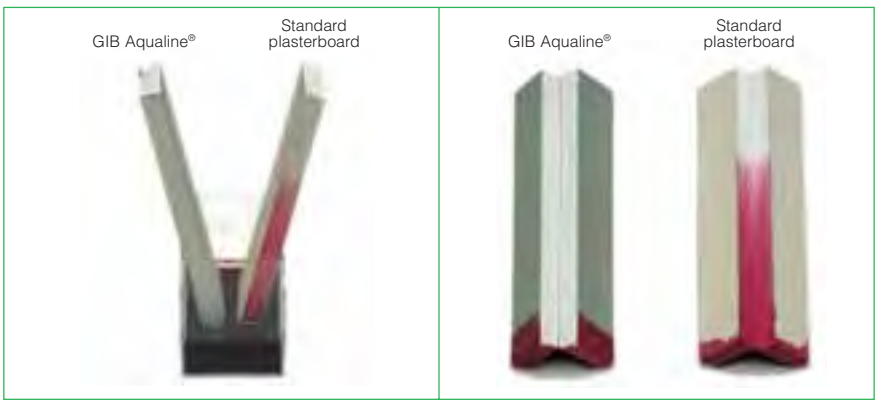
The NZBC does not call for water resistant linings in wet areas but it is highly desirable to incorporate lining materials which will maintain their integrity longer when exposed more frequently to water or steam and particularly to one-off events such as leakages or flooding of a room.

GIB Aqualine® is ideal in such situations because it features a water resistant wax polymer impregnated core.

Unlike other commonly used substrates, the GIB Aqualine® core not only resists penetration of water through the lining into the framing behind, but also resists water "wicking" up the core, a common cause of long-term damage where a water resistant lining has not been used.

GIB Aqualine® will maintain its integrity for extended periods, particularly where wicking over large areas can destroy the integrity of the interface between the lining and paint or wallpaper surfaces or between the lining and the tile adhesive.

The illustrations below graphically show the difference between GIB Aqualine® and standard plasterboard after a two-hour soak test in red dye.



Introduction/Design Considerations

GIB AQUALINE® *continued*

Where to Use GIB Aqualine®

Though not required by NZBC, it is highly desirable to include GIB Aqualine® in all areas at risk of water or moisture damage, in order to prolong the life expectancy of that space.

They include:

	WALLS	CEILINGS
BATHROOMS	✓	✓
SHOWERS	✓	✓
LAUNDRY	✓	✓
KITCHEN	✓	
TOILET	✓	

Benefits

- Water resistant and durable to help protect against water damage
- Proven substrate for paint, wallpaper, tiles, sheet vinyl and rigid sheet shower linings with installations in over 300,000 bathrooms in New Zealand
- Suitable for both residential and non-residential applications
- Dimensionally stable, will not buckle or warp, hence an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains fibreglass and other additives for strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB® Noise Control Systems (see Compliance with the NZBC, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details
- Green face paper for ease of recognition.

Sheet Dimensions and Weights

SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE AND TE/TE)		MAXIMUM WEIGHT/m²
Thickness (mm)	**Length (mm)**	
10	2400, 2700, 3000, 3600	7.8kg
13	2400, 2700, 3000, 3600	10.2kg

Handling and Storage

- GIB Aqualine® must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB Aqualine® must be handled as a finishing material.

APPRAISAL

The document entitled *GIB Aqualine® Wet Area Systems* 2007 has been appraised by BRANZ, Appraisal Certificate, No. 427 (2007).

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC)

Structure – Clause B1

The design and material specification for steel and timber framing used in GIB Aqualine® systems must be in accordance with the performance requirements of NZBC Clause B1 (Structure). See Bracing in Wet Areas on page 5.

Durability – Clause B2

When installed and maintained in accordance with this literature, GIB Aqualine® tiled or vinyl covered systems have a serviceable life of at least 15 years. They comply with the requirements of NZBC Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB Aqualine® systems have a serviceable life of at least 50 years and comply with NZBC Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

Spread of Fire – Clause C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZBC Clause C3 (Spread of Fire). When GIB Aqualine® is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

Design Considerations

MARCH 2007

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC) *continued*

Internal Moisture – Clause E3

When installed in accordance with this literature, tiled or vinyl covered GIB Aqualine® systems may be used in areas directly exposed to liquid water, such as showers, to provide an impervious and easily cleaned wall surface. These systems comply with the requirements of NZBC Clause E3 (Internal Moisture).

Hazardous Building Materials – Clause F2

At no stage during handling, installation, or serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZBC Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

Ventilation – Clause G4

NZBC Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

Airborne and Impact Sound – Clause G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZBC Clause G6 (Airborne and Impact Sound). When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline 0800 100 442.

LIMITATIONS

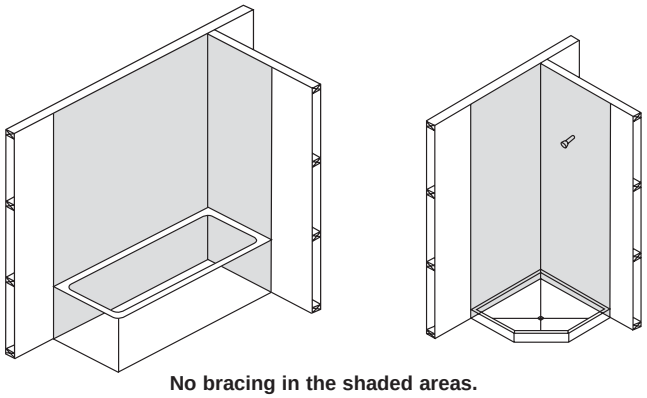
- GIB Aqualine® must not be used for bracing purposes in shower cubicles or above baths (see Bracing in Wet Areas below)
- Do not use GIB Aqualine® where it may be exposed for extended periods to humidities of 90% RH and above. Such areas include group shower or steam rooms as well as moisture and chlorine rich environments such as indoor swimming pools
- GIB Aqualine® must not be directly applied to solid plaster (gypsum or cement), wood based sheet linings or similar materials, masonry or concrete. GIB Aqualine® may only be applied to these materials where timber strapping or steel furring channels are installed
- GIB Aqualine® must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details.

BRACING IN WET AREAS

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members.

Otherwise, GIB® Bracing Systems can be used in water-splash areas as defined by NZBC Clause E3/AS1, provided these are maintained impervious for the life of the building.

GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100mm centres, using the GIB Braceline® corner fixing pattern.



No bracing in the shaded areas.

Design Considerations

MARCH 2007

NEW ZEALAND BUILDING CODE

E3.3.4 requires impervious and easily cleaned surfaces to all surfaces adjacent to sanitary fixtures or laundering facilities.

E3.3.5 requires that surfaces of building elements likely to be splashed or contaminated in the course of the intended use of the building must also be impervious and easily cleaned.

E3.3.6 requires that surfaces of building elements likely to be splashed must be constructed in a way that prevents water from penetrating behind linings or into concealed spaces (e.g. wall cavities).

Walls in wet areas therefore need to be addressed according to whether they fall within the scope of one of the following descriptions:

1. Wall surface likely to be splashed
2. Shower walls. Although not a requirement of NZBC it is highly recommended that the wall surfaces within 150mm of the top edge of a bath, and the vertical faces immediately under the edge of a bath, are treated in the same way as for a shower wall.

WALL SURFACES IN AREAS LIKELY TO BE SPLASHED

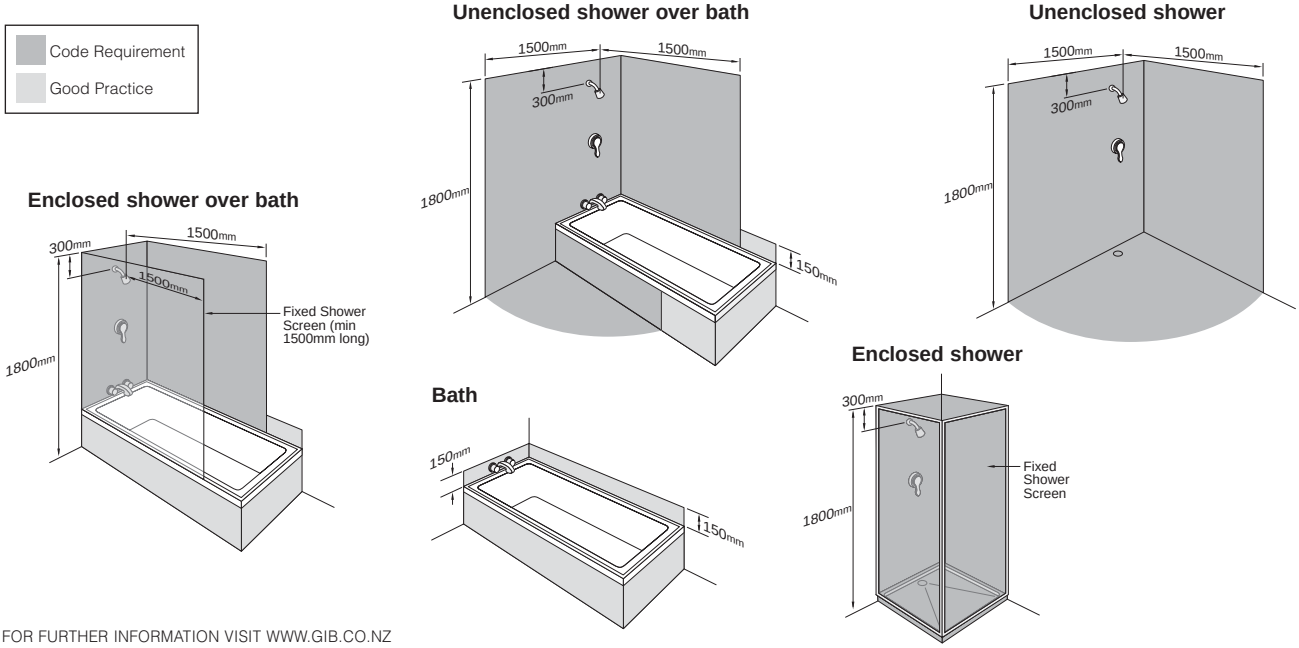
Suitable linings include:

a. Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints
b. Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use
c. Cement based solid plaster or concrete having a steel trowel or polished finish (semi-gloss or gloss paint must be used if a paint finish is required)
d. Cork tile or sheet sealed with waterproof applied coatings
e. Monolithic applied coatings having a polished, non-absorbent finish (e.g. terrazzo)
f. Sheet linings finished with vinyl coated wallpaper, or semi-gloss or gloss coating
g. Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin
h. Modular or multiple lining units which are themselves *impervious* and easily cleaned, and are installed with *impervious* joints
i. Timber or timber-based products such as particleboard sealed with waterproof applied coatings.

NB: Floor surfaces and floor/wall junctions are required by E3 to be impervious.

SURFACES IN SHOWERS AND AROUND BATHS

Suitable linings include all of the above, but **NOT including items (d) and (f) from the above list.**
Note that a waterproof membrane complying with AS/NZS 4858: 2004 **MUST** be applied to all lining materials used under ceramic tiles in these areas.
The waterproof membrane must extend to a 1500mm horizontal radius from a shower rose unless the shower is contained within a fixed enclosure. A shower curtain does not constitute a fixed enclosure.
Particleboard manufacturers recommend that in wet areas, panels should be protected with a suitable wet area membrane or an integrally waterproof sheet material. Some local authorities call for this treatment on all timber based floors. Local requirements should be checked before proceeding.
Dark grey shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membranes prior to tiling. Light grey shaded areas represent good practice.



Design Considerations

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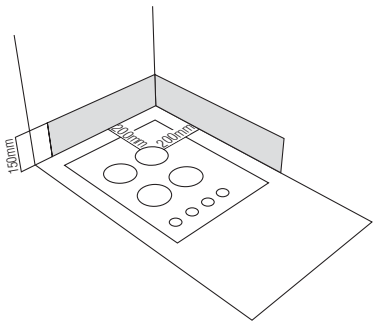
WALL SURFACES SURROUNDING COOKTOPS

The protection of combustible surfaces surrounding gas cooking appliances is covered by NZS 5261. Consult the current version of this standard to ensure compliance.

However, as a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm ceramic tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the requirements of Clause 2.6.2.6 of NZS5261.



Because of the moisture generated by cooking, it is highly recommended that GIB Aqualine® is used in kitchen areas.

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. However, it would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Sealants should be of a mould inhibiting type and be neutral cure. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Gun a bead of silicone sealant to the full depth of the GIB Aqualine® in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the GIB Aqualine®
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the GIB Aqualine® wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable then refer to the publication *Penetrations in GIB® Fire Rated Systems*. Always use tested and approved proprietary solutions.

WATERPROOF MEMBRANES

- A waterproof membrane must be applied to **all** lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane over the lining and the jointed areas shown shaded on page 6
- Only in-situ waterproofing materials which are manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and applied to manufacturer’s recommendations. Typically, these types of membranes are not suitable for paint and wallpaper finishes
- Waterproof membranes must be fully cured and dry prior to application of tiling adhesives
- Embed reinforcing mats in the membrane at all internal corners of the shower (including floor/wall junctions)
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this technical literature are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane.

TILING

GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10mm GIB Aqualine® up to 20kg/m^2
- 13mm GIB Aqualine® up to 32kg/m^2.

Note: Most ceramic and porcelain tiles weigh less than 20kg/m^2.

For further information on tiling consult the BRANZ *Good Practice Guide – Tiling*.

Design Considerations

MARCH 2007

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine® is a suitable substrate for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures for the GIB Aqualine® substrate shall be as per page 10 or 11, except that the lining gap at the floor should be reduced to 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles (32 x 32 x 0.55mm) behind internal GIB Aqualine® corners is recommended for sheet vinyl applications in showers or shower over bath situations (see illustration page 14)
- The GIB Aqualine® lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph through even a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended for the wall finish in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of the flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/manufacturers of the vinyl.

RIGID SHEET SHOWER LININGS

- The manufacturers/suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- **Do not preseal or paint** areas which are to be covered by the rigid shower linings
- The wall surface must be free of dust before installation of the lining
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service
- Care must be taken to ensure that rooms are adequately ventilated and the adhesive is fully cured before the shower is used
- Consult the manufacturer/supplier of the shower lining for full installation details.

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture within those spaces.
In most cases when renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them with GIB Aqualine®. This allows for a completely new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation and water resistant linings where appropriate
- Make the job easier.

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often very expensive failure of components and building elements within wet areas.
It is important to regularly inspect and repair any potential problem before it becomes a major problem and expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and recoated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out.

Non-residential and Apartments

MARCH 2007

High-rise and commercial wet areas can generally be divided into four separate categories:

HIGH-RISE APARTMENTS AND INTERTENANCY

Wet areas in apartment complexes are generally covered by Clause E3 of the NZBC and will have the same requirements as shown for residential applications. However, apartment buildings will also involve intertenancy walls requiring noise control and fire resistance.
Generally, noise control and fire resistance are the first consideration and then the water resistance is added to those systems.
For noise control, GIB Aqualine® can substitute for the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®.
For fire resistance, GIB Aqualine® can substitute for GIB Fyreline® of equivalent thickness.
In all cases the prescribed noise control or fire resistance system specifications must be followed completely as presented in the GIB® publications *GIB® Noise Control Systems* and *GIB® Fire Rated Systems*.
Refer to typical details on page 25.
The NZBC for intertenancy calls for special consideration to be given to preventing water from travelling from one tenancy to another. This calls for a waterproof membrane to all wet area floors with upstands to walls and the inclusion of floor wastes.
It is important to avoid penetrations such as taps, shower roses, etc. in intertenancy walls as this will compromise fire and noise ratings.

OFFICE, WORKPLACE AND SCHOOLS

These wet areas are generally no different in requirements to those shown in this publication or those of high-rise apartments, and are treated in the same manner.
As there is often a higher impact requirement in commercial applications, 13mm GIB Aqualine® is the minimum thickness recommended.
These areas are often finished in sheet vinyl or ceramic tiles and GIB Aqualine® is an ideal substrate, particularly in the case of sheet vinyl where a high quality finish is required to minimise telegraphing of imperfections in the substrate.

HEALTHCARE AND HOSPITALS

This industry will generally have special requirements for wet areas. GIB Aqualine® will generally satisfy specific design needs in healthcare facilities and in particular is an ideal substrate for the preferred finish of sheet vinyl.

PUBLIC AMENITIES AND SPORTS CLUBS

Public amenities and sports clubs often have a high demand for impact resistance, therefore 13mm GIB Aqualine® should be used, and suitable impact resistant wall coverings considered, such as heavy duty sheet vinyl or ceramic tiles over waterproof membrane to 1200mm high.
Also full consideration should be given to the usage of the amenity and whether high pressure or chemical cleaners will be used or if the amenity may be subject to vandalism.
Because of extreme humidity and presence of chemicals, GIB Aqualine® is not suitable for enclosed swimming pool areas.
Contact the GIB® Helpline on 0800 100 442 for further assistance.

Non-tiled Walls – Timber Framing

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If bracing, noise control or fire rating considerations exist, consult the relevant GIB® technical publication, e.g. *GIB® Fire Rated Systems, GIB® Noise Control Systems, GIB® Bracing Systems*, for the appropriate information.

Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems.

Fasteners

- 10mm GIB Aqualine® – minimum 25mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails
- 13mm GIB Aqualine® – minimum 32mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails.

Fastener Centres

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element.

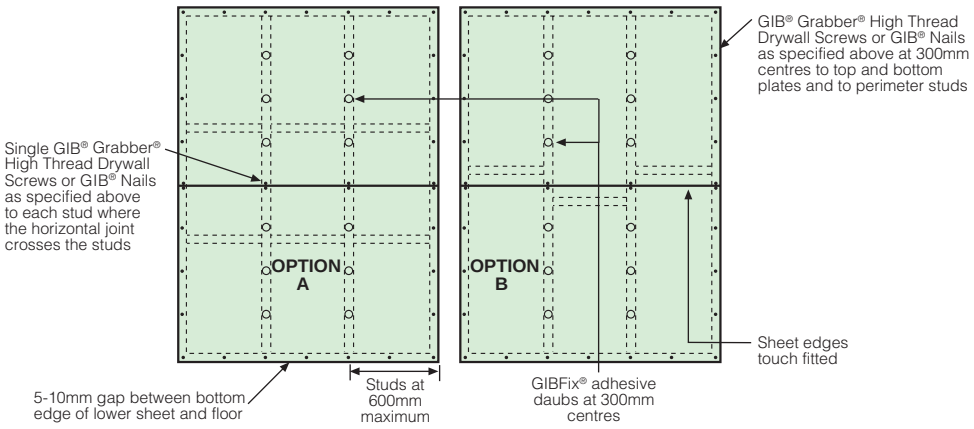
Lining

- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

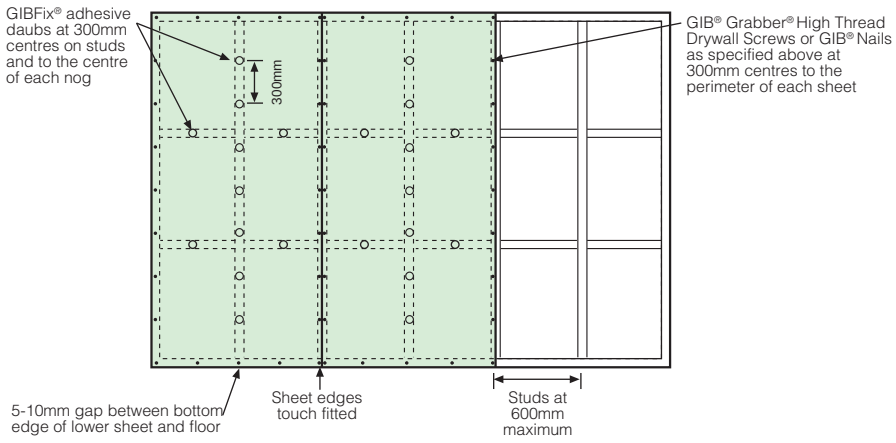
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*; GIB® AquaMix is recommended for the first two coats.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



Non-tiled Walls – Steel Framing

MARCH 2007

The minimum sheet thickness for fixing on light gauge steel framing is 13mm GIB® plasterboard.
Steel framing for residential construction is by specific design.
If noise control or fire rating considerations exist, consult the relevant GIB® technical publication (e.g. *GIB® Fire Rated Systems or GIB® Noise Control Systems)* for the appropriate information.

Wall Framing

- Steel stud dimensions to be minimum 63 x 34 x 0.55mm nominal with a 6mm return
- Steel channel dimensions to be minimum 63 x 30 x 0.55mm nominal
- Studs shall be spaced at 600mm centres maximum
- Ensure that the studs are placed with the open side facing in the same direction (see *GIB® Site Guide*).

Fasteners

- 25mm x 6g GIB® Grabber® Self Tapping Drywall Screws.

Fastener Centres

- 300mm centres to top and bottom channels and to end studs
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® All-Bond adhesive OR screws at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed.

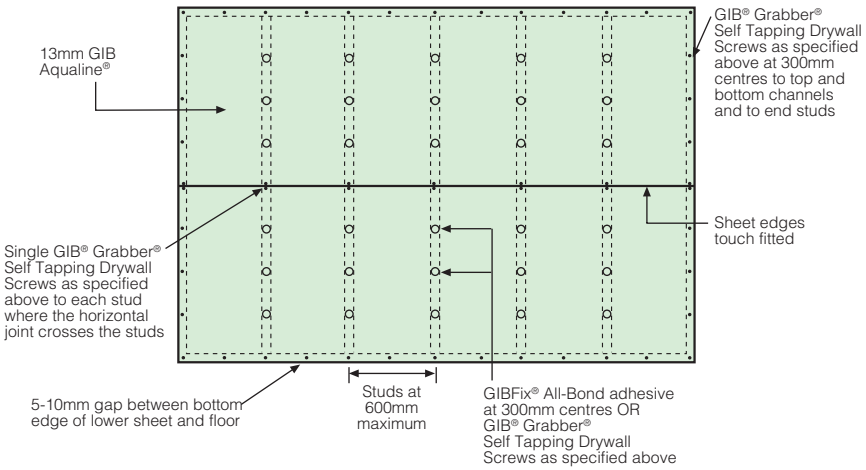
Lining

- Lay the sheets, leaving a 5-10mm gap at the floor line.
  Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry
- Sheets to be touch fitted.

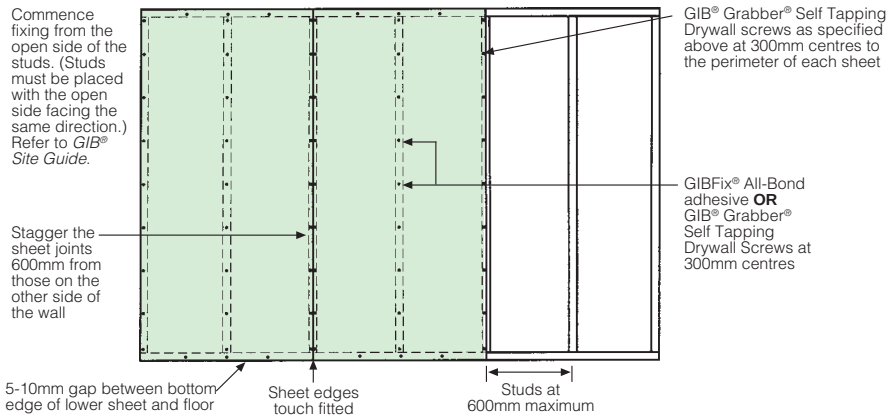
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*. GIB® AquaMix is recommended for the first two coats.

Fastening and Jointing the Linings – Horizontal Fixing



Fastening and Jointing the Linings – Vertical Fixing



Tiled Walls

MARCH 2007

Important: See page 6 and 7 for waterproof membrane requirements.

Wall Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle. Each side of the angle shall be fastened to the framing with 30mm galvanised clouts at 300mm centres
- Steel stud systems do not generally require nogs except as below:
  - Adjacent to each pipe penetration and behind sink and tub flashings
  - Between all studs above bath flanges and preformed shower bases
- For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require either vertical fixing of the GIB Aqualine® or the installation of some additional nogs.

Fasteners

- For 10mm GIB Aqualine® use minimum 25mm x 6g GIB® Grabber® Drywall Screws
- For 13mm GIB Aqualine® use minimum 32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

- GIB® Grabber® Drywall Screws at 100mm centres to perimeter of wall and to all intermediate studs
- Adhesive is not to be used in place of mechanical fastenings.

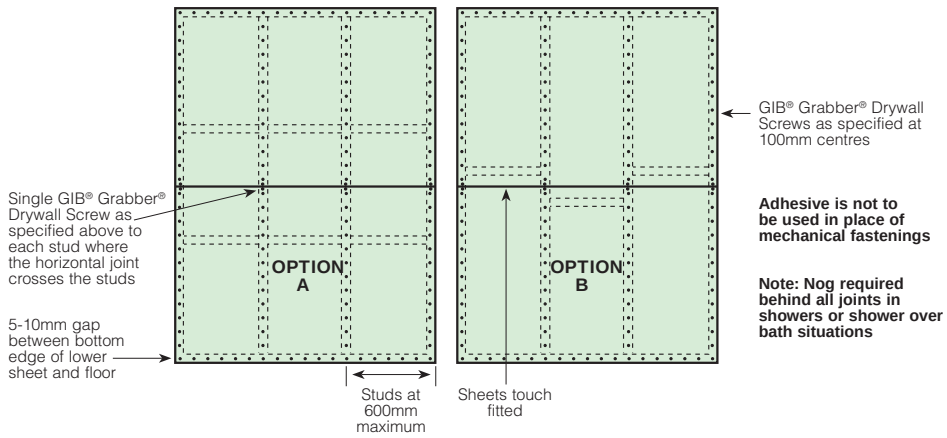
Lining

- 10mm or 13mm GIB Aqualine® is suitable for use on timber framing and for tile weights up to 20kg/m^2
- 13mm GIB Aqualine® must be used for tile weights between 20 and 32kg/m^2 and when light steel framing has been used
- GIB Aqualine® may be fixed vertically or horizontally
- Provide a 5-10mm gap at the wall/floor junction
- Provide a 5-10mm gap between the bottom edge of the GIB Aqualine® and any bath rim or preformed shower base to allow for placement of sealant
- GIB Aqualine® sheets shall be touch fitted
- Where the framing or fastener centres required for tiled areas are closer than those specified for GIB® Fire Rated and GIB® Noise Control Systems, the tiling specification shall prevail. Where relevant, check that fastener lengths comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems.

Jointing

- Jointing shall be carried out in accordance with instructions in the *GIB® Site Guide*
- Water resistant GIB® AquaMix is recommended for the first two coats
- No top coat is required.

Fastening the Linings – Horizontal Fixing in Tiled Areas



Note:

GIB Aqualine® is suitable for tiling to full height of walls, but if a wall is to be partially tiled (i.e. half high), only the area of wall under the tiles needs to be fixed as above. The remainder of the wall may be fixed as for non-tiled area (see page 10 & 11).

Ceilings

MARCH 2007

Ceiling Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.
If bracing, noise control, fire rating considerations exist consult the relevant GIB® publication for appropriate information.

Fasteners

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping Drywall screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber High Thread Drywall screws.

Adhesives

- Steel battens – GIBFix® All-Bond
- Timber battens – GIBFix® Wood Bond (not suitable for LOSP treated timber).

Fasteners Centres

- Single screws to the edges and centre of the sheets across each batten
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops.

Lining

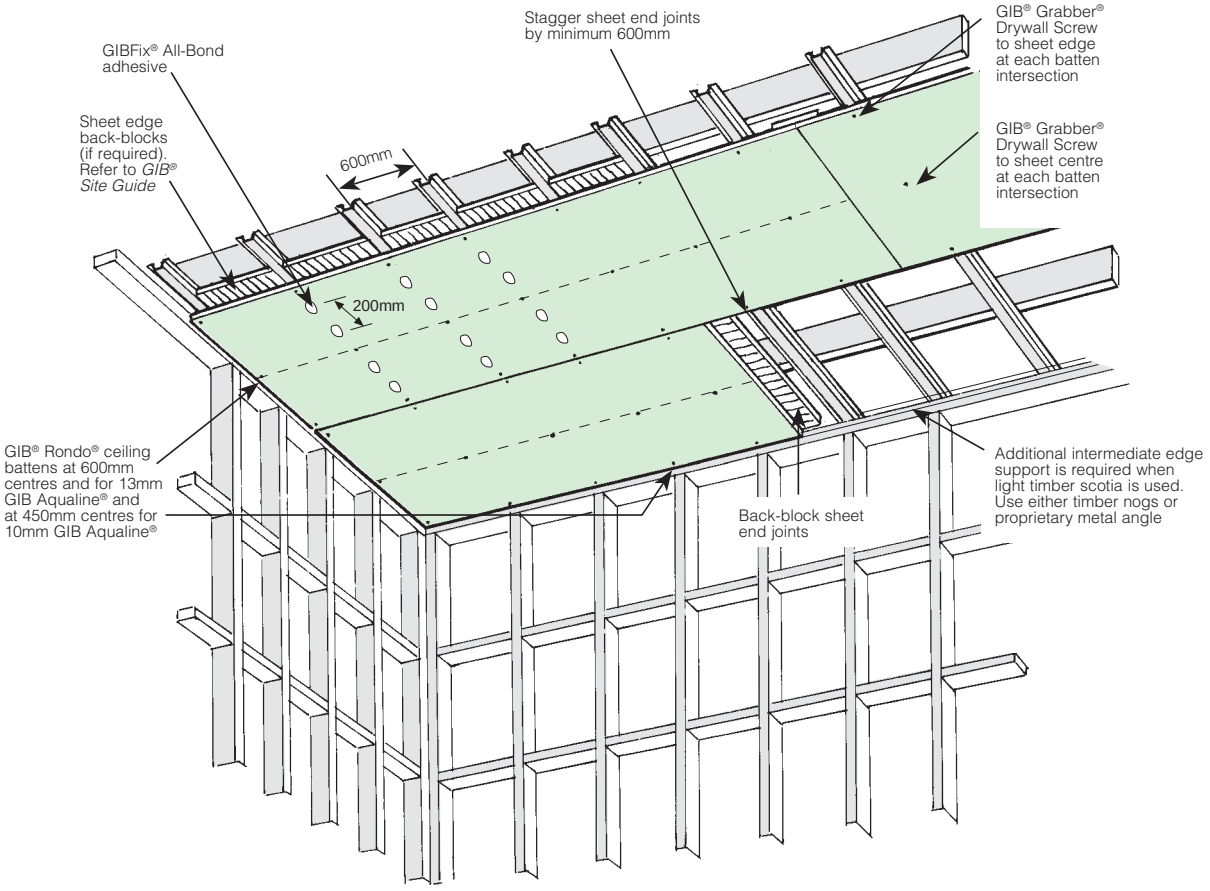
- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements.

Batten Spacings

- 13mm GIB Aqualine® plasterboard – 600mm centres max
- 10mm GIB Aqualine® plasterboard – 450mm centres max.

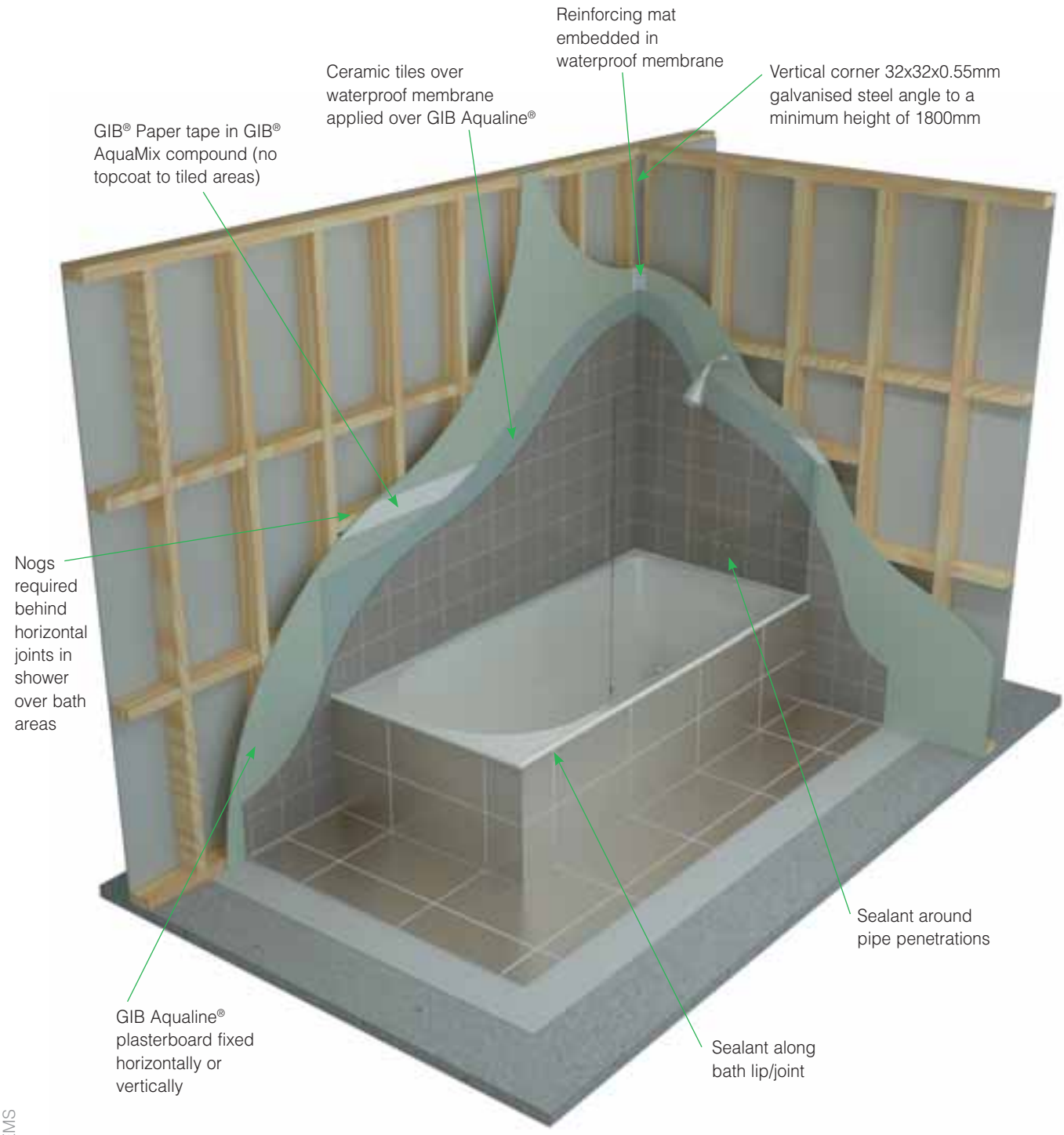
Jointing

- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the *GIB® Site Guide*. Water resistant GIB® AquaMix is recommended for the first two coats.
- Do not fix tiles to GIB® plasterboard ceilings.



Shower Over Bath – Tiled Walls

MARCH 2007



Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture.

For typical details, see the following pages.

Shower Over Bath – Tiled Walls

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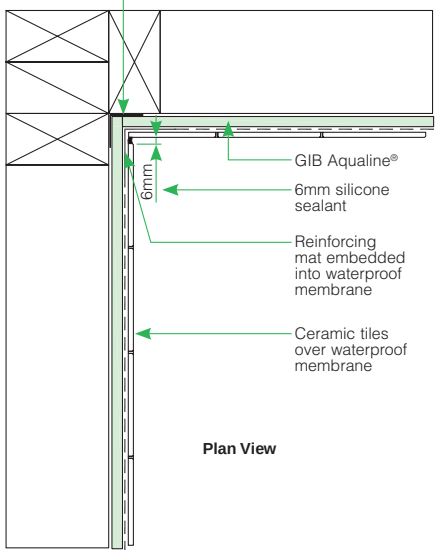
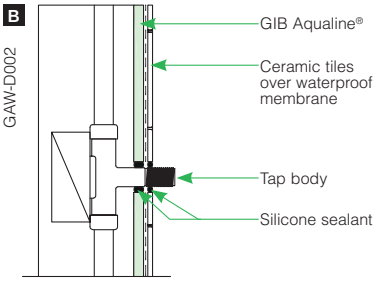
A GAW-D001



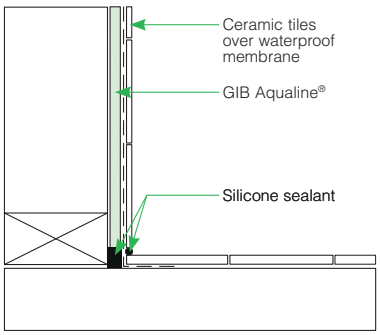
Plan View

B GAW-D002



Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

C GAW-D003



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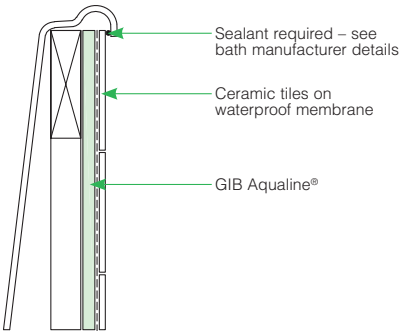

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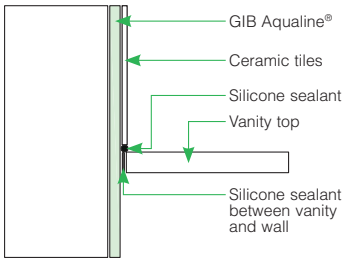

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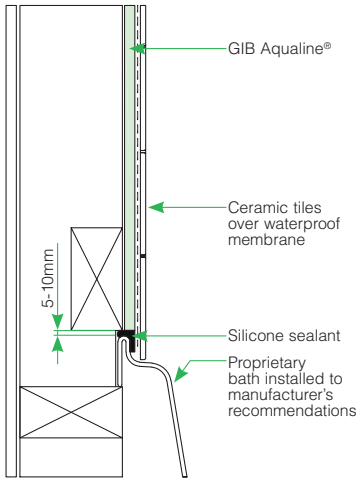

Shower Over Bath – Acrylic Liner

MARCH 2007

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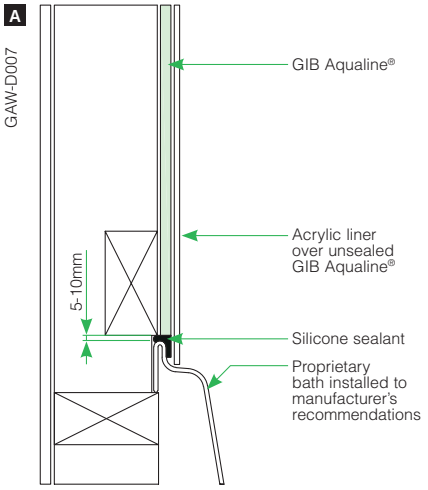

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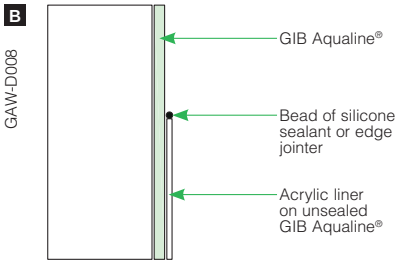

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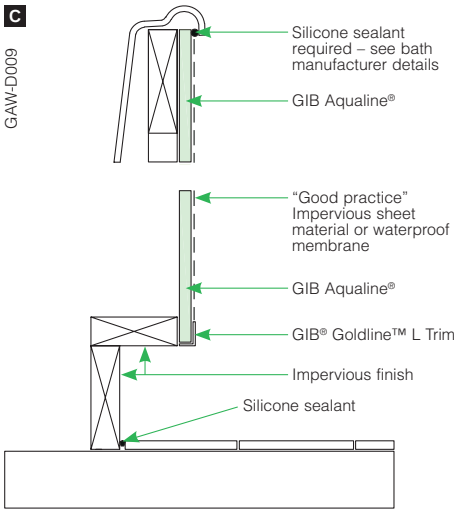

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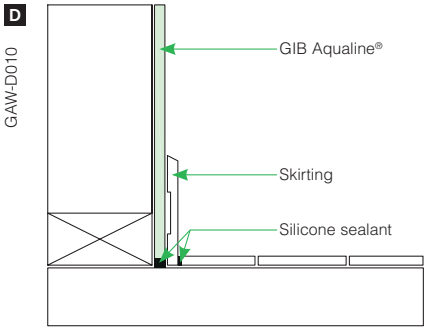

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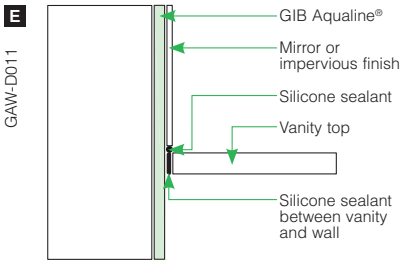

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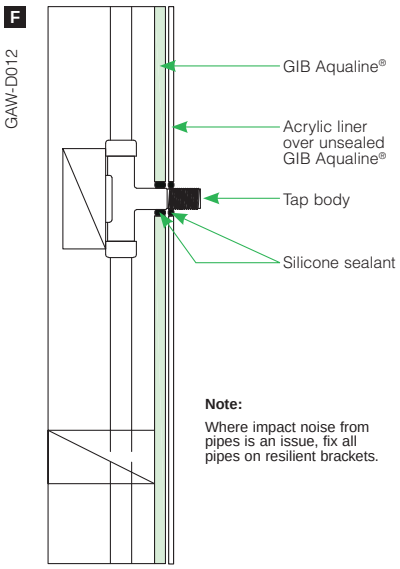
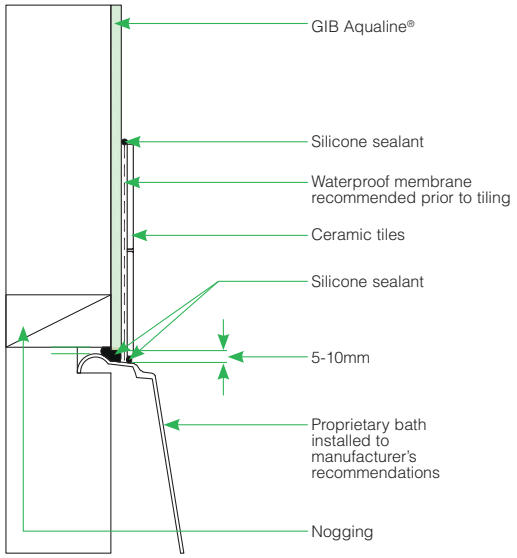


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

Bath – Tiled Upstand

MARCH 2007

A GAW-D013



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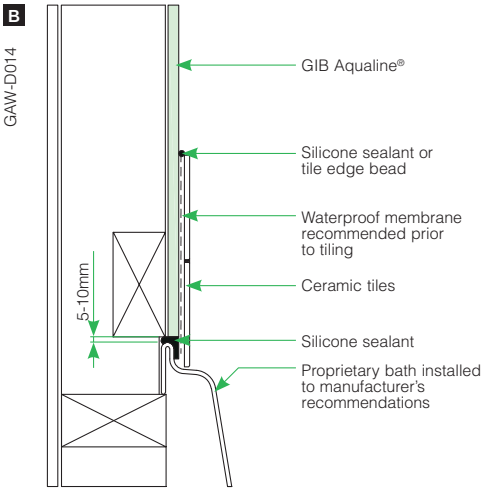

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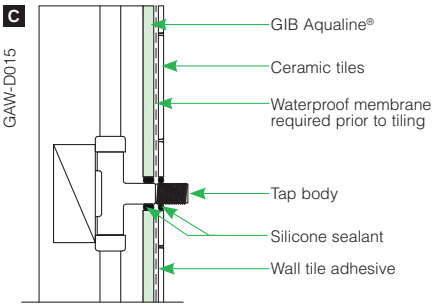
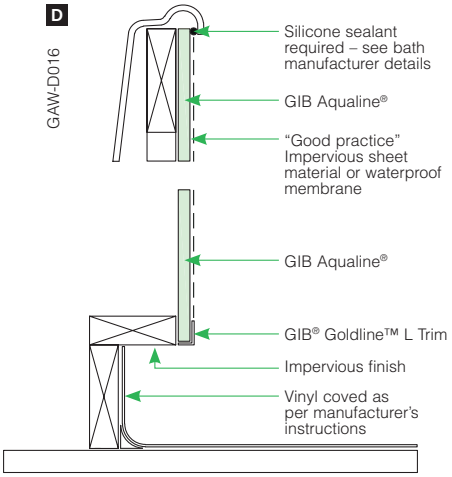
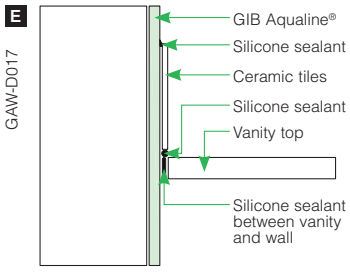


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

D GAW-D016

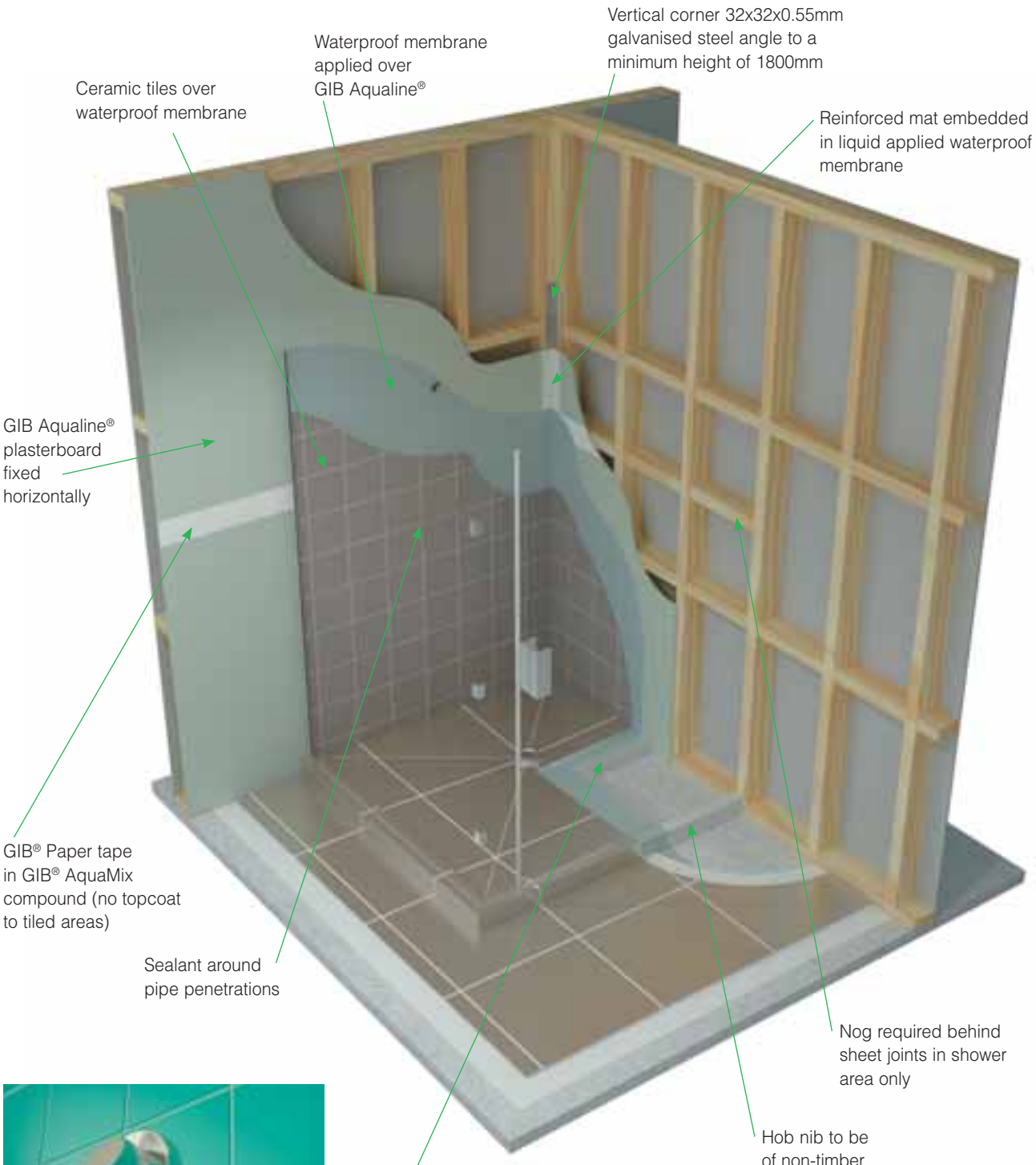


E GAW-D017



Shower – Tiled Walls and Base

MARCH 2007



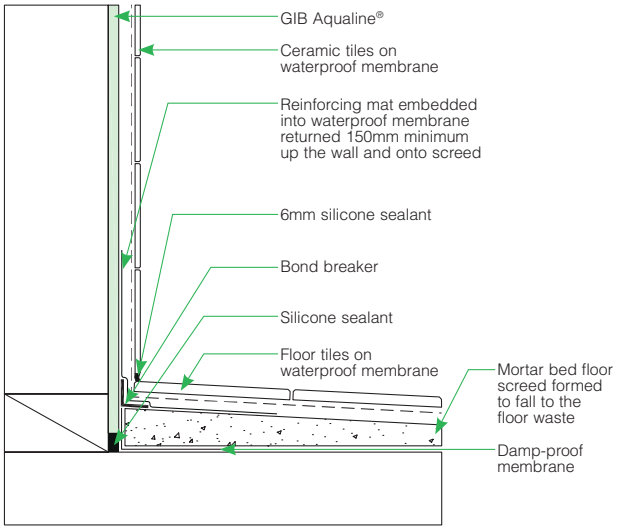
Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture.

For typical details, see the following pages.

Shower – Tiled Walls and Base

MARCH 2007

A GAW-D018



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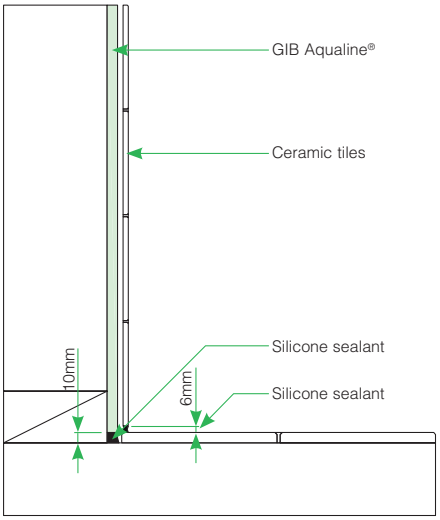
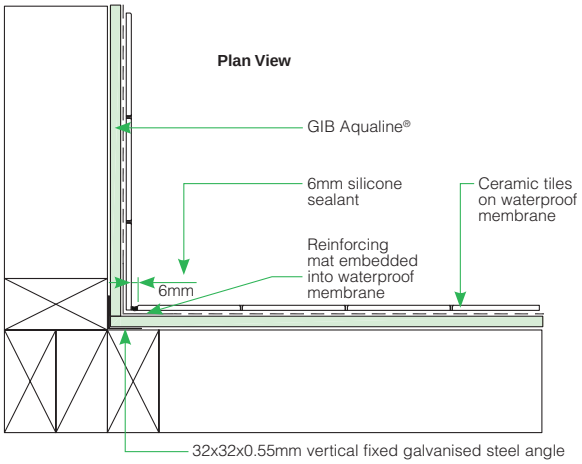
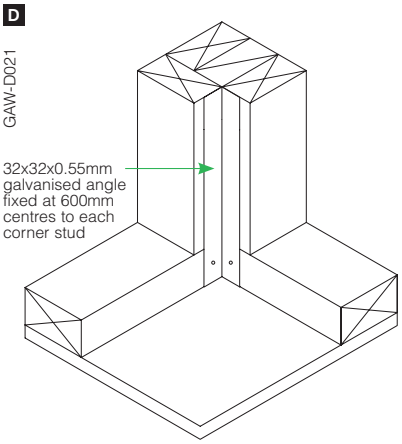


C GAW-D020



D GAW-D021



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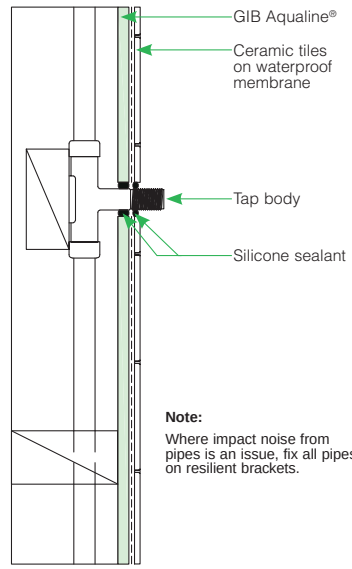
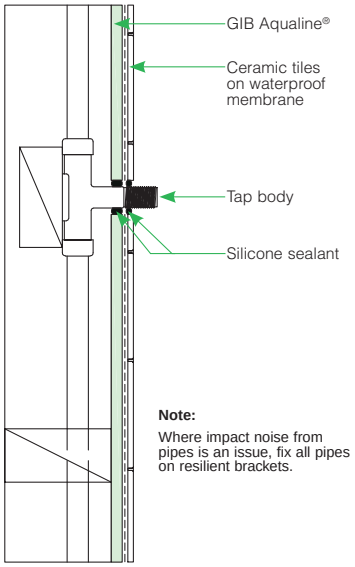


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

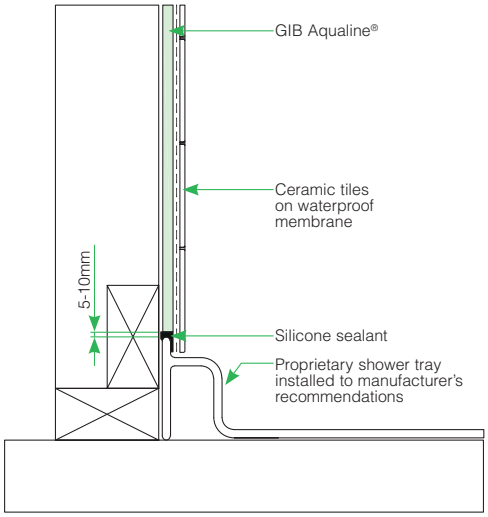
Shower – Tiled Walls and Acrylic Base

MARCH 2007

A GAW-D023



B GAW-D024



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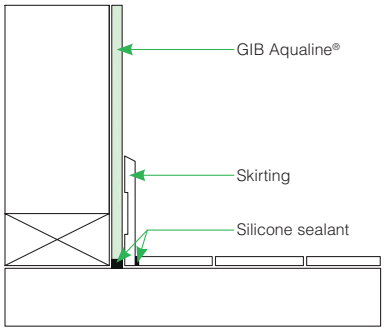
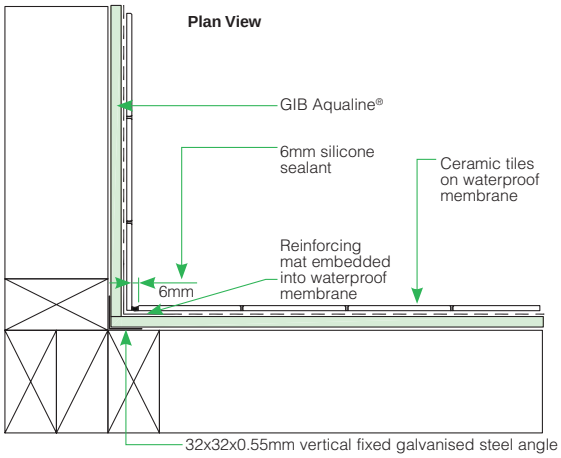
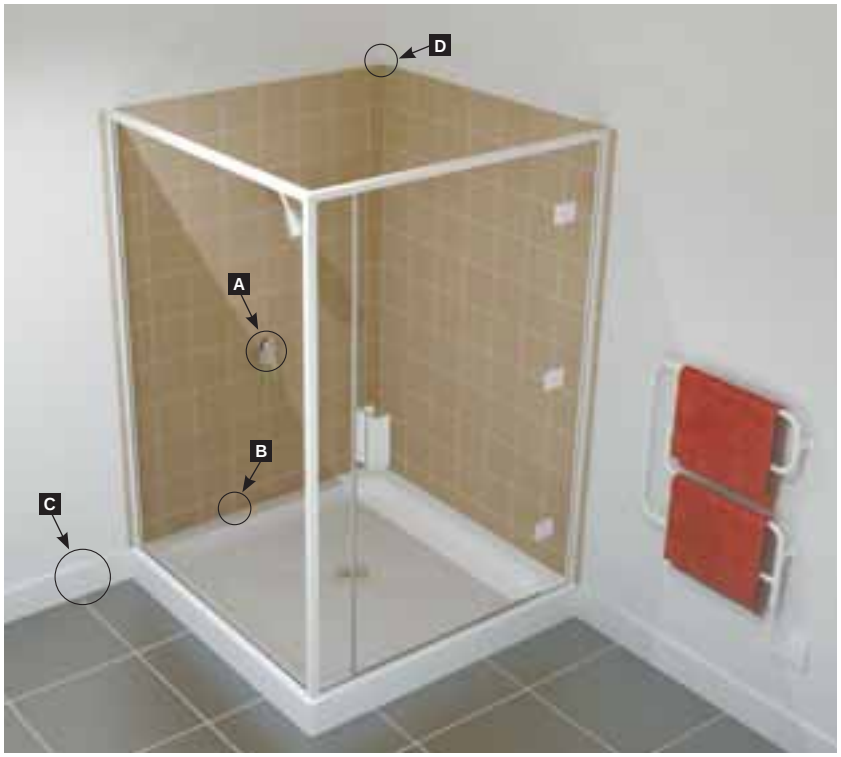


D GAW-D026



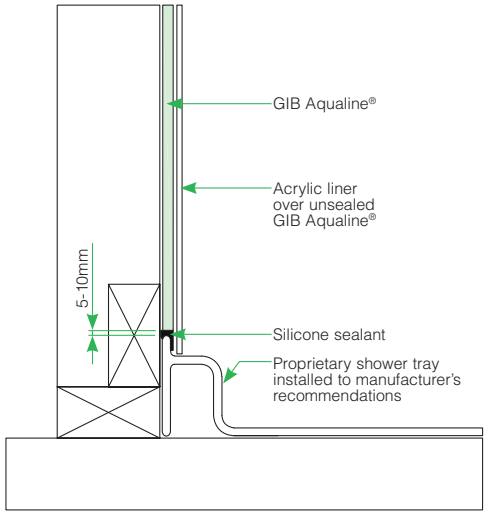


Shower – Acrylic Liner and Base

MARCH 2007

A

GAW-D027



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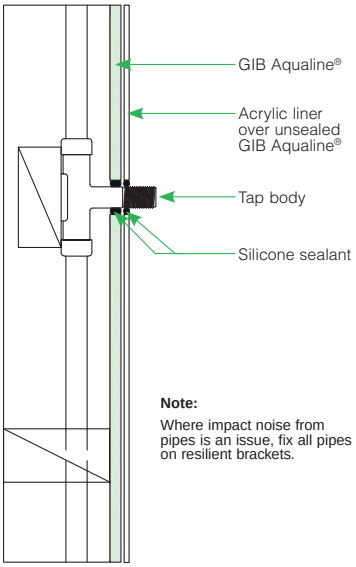
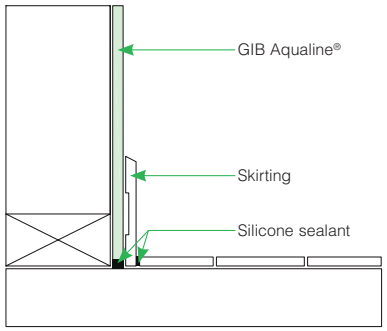
GAW-D028



Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

C

GAW-D029



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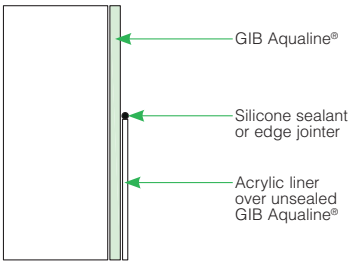
GAW-D030

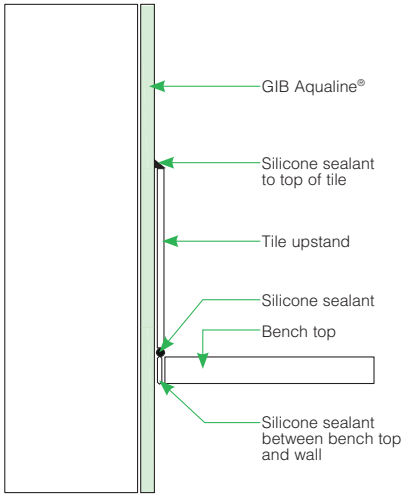


Kitchen and Laundry

MARCH 2007

A

GAW-D031



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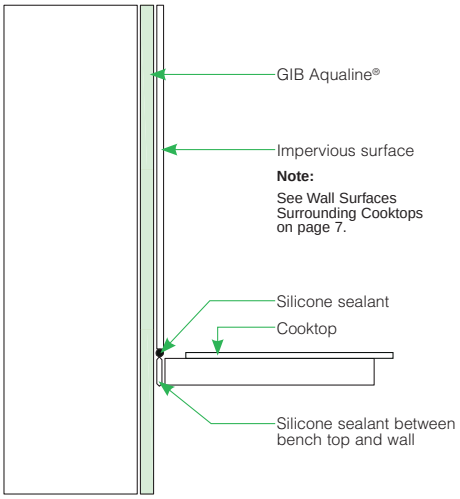
GAW-D032



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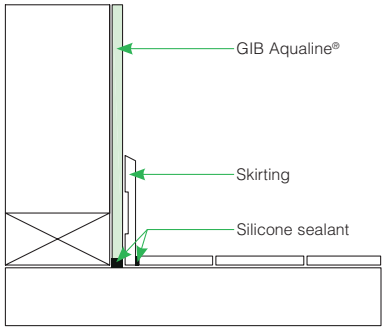
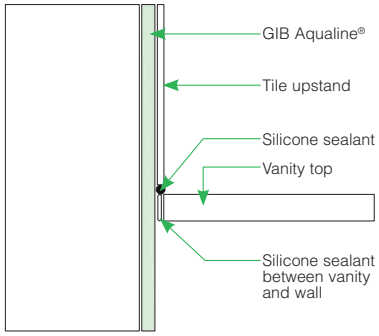


Office, Workplace or School Bathroom

MARCH 2007

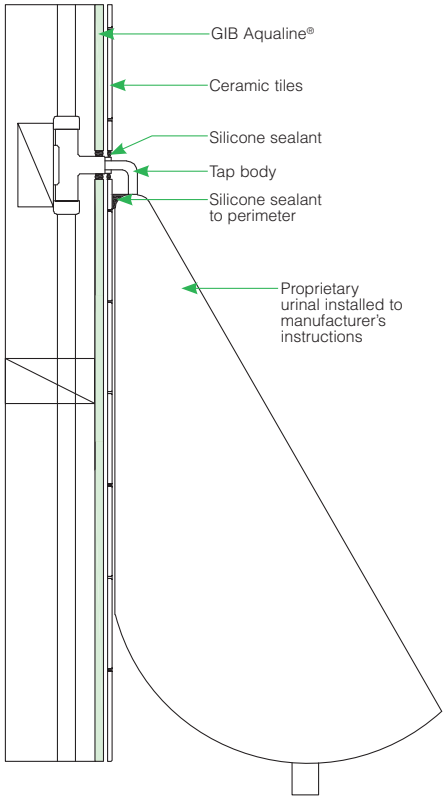
A

GAW-D034



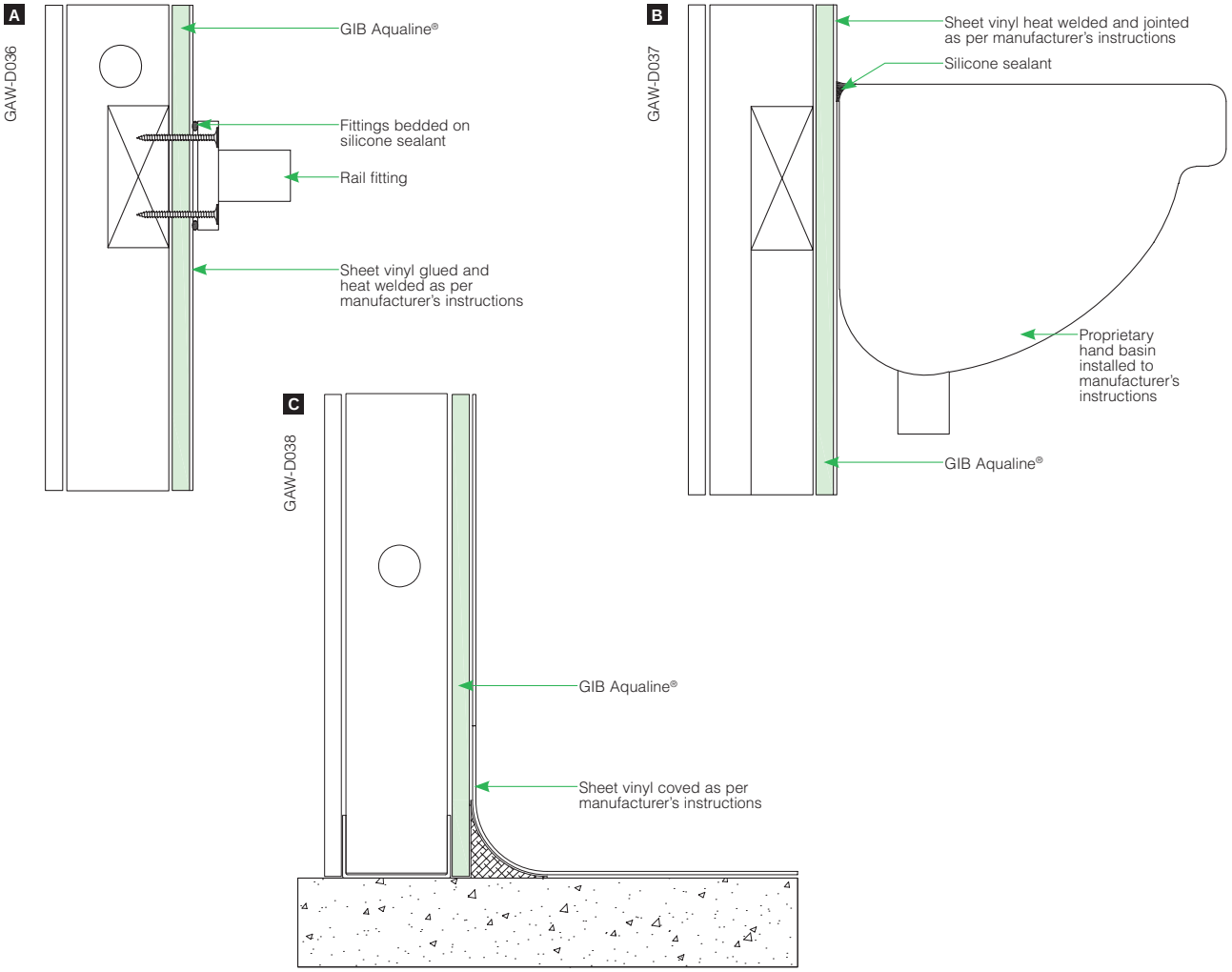
B

GAW-D035



Healthcare and Hospital Bathroom

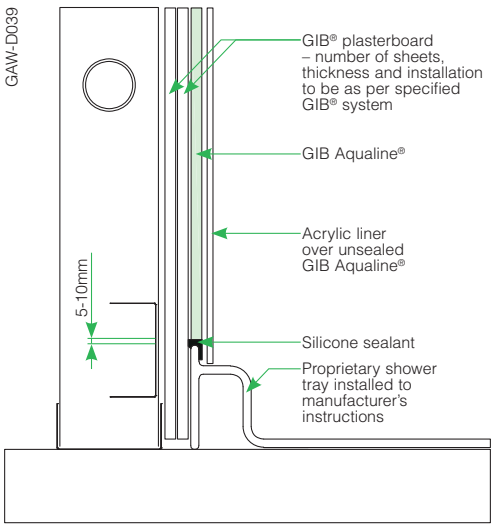
MARCH 2007



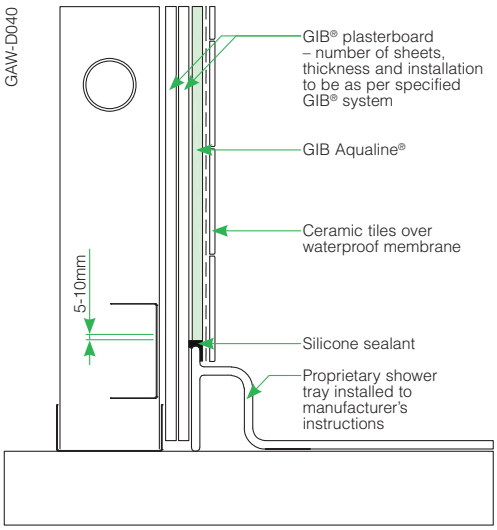
Fire Rated and Noise Control

MARCH 2007

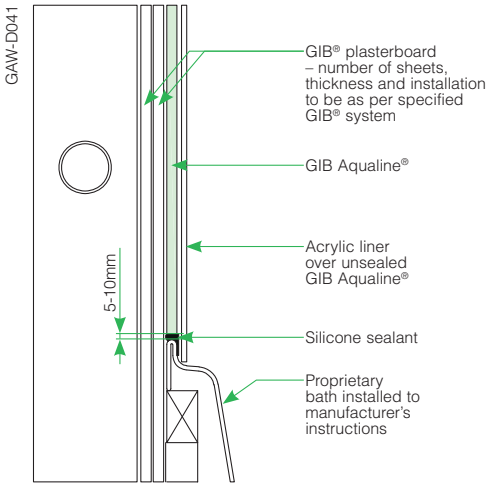
Shower – Acrylic Liner



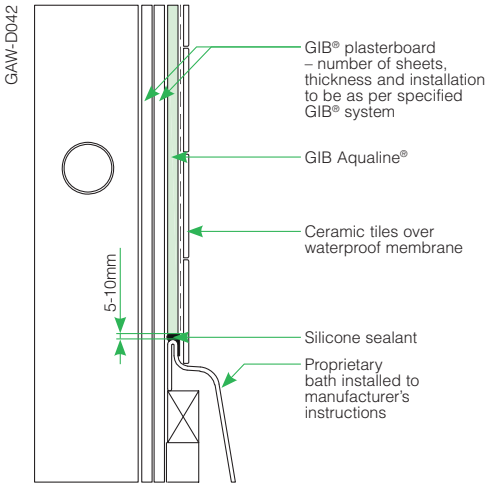
Shower – Tiled Walls



Shower Over Bath – Acrylic Liner



Shower Over Bath – Tiled Walls



GIB Aqualine® Fire Resistance and Noise Control Performance

When GIB Aqualine® is substituted into GIB® Fire Rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline on 0800 100 442.

Specification and Installation Checklist

MARCH 2007

Contract ID	
Site Address	
Client Name	
Designer	
Builder	
Plasterboard Installer	
Plasterboard Supplier	
Tiler	
Shower Installer	

DESIGNER	YES	NO	CHECKED BY	DATE
GIB Aqualine® specified for wet areas and appropriate details included on plans?				
Are tiled areas clearly shown on plans?				
Is area requiring waterproof membrane clearly shown on plan?				
Is the waterproof membrane required to be installed by a licensed applicator? If so, is this noted on the documentation?				
No bracing behind shower or bath?				
BUILDER	**YES**	**NO**	**CHECKED BY**	**DATE**
Galvanised steel angle installed to the internal corners of tiled shower?				
All sheet joints in showers to be made on solid timber. This may require some additional dwangs for horizontal board installation.				
PLASTERBOARD INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
10mm GIB Aqualine® for tiles up to 20kg per m^2?				
13mm GIB Aqualine® for tiles up to 32kg per m^2?				
GIB Aqualine® mechanically fastened at 100mm centres when tiles are to be installed?				
All junctions between GIB Aqualine® and walls, floors, baths, showers and other elements are correctly sealed with appropriate sealant?				
Pipe penetrations sealed?				
PLASTERBOARD STOPPER	**YES**	**NO**	**CHECKED BY**	**DATE**
Air drying compound (e.g. GIB ProMix® or GIB Plus 4®) not to be used on areas to be tiled.				
Recommended that GIB® AquaMix is used in wet areas.				
TILER	**YES**	**NO**	**CHECKED BY**	**DATE**
Waterproof membrane applied to shower areas prior to tiling?				
SHOWER INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
GIB Aqualine® walls must not be sealed or painted under where acrylic linings are to be installed.				
Ensure GIB Aqualine® is free from dust before installation of acrylic liners.				
Sealant applied to top edge of acrylic shower linings?				
BUILDER/PLUMBER	**YES**	**NO**	**CHECKED BY**	**DATE**
Sealant applied under penetration face covers?				

ROOFING

NEW ZEALAND STEEL

June 2010
(Replaces November 2005)

SPECIFIERS AND BUILDERS GUIDE

GALVSTEEL™ Axxis® STEEL FOR FRAMING COLORSTEEL® Zincalume®

CONTENTS

DESCRIPTION

New Zealand Steel produces a range of coated steel products.

COLORSTEEL® prepainted steel describes those steel building materials which have oven-cured paint applied to a galvanised or ZINCALUME® steel base on a continuous 'coil to coil' operation at the New Zealand Steel Glenbrook works.

The prepainting process gives excellent adhesion of the coating to the substrate, allowing rollforming to be performed after painting without delamination or deterioration of the paint film.

A variety of COLORSTEEL® prepainted steel coating types is offered. All COLORSTEEL® products are produced using either a ZINCALUME® steel substrate with an AZ150 or AZ200 coating class, (i.e.: 150 g/m^2 or 200 g/m^2 of zinc/aluminium alloy), or a galvanised steel substrate with a ZM275 coating class (i.e. 275 g/m^2 of zinc).

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

COLOUR FOR THE EXTREME

COLORSTEEL® MAXX™ products have a ZINCALUME® coated steel base. This product is intended for Very Severe environments.

COLOUR FOR THE FUTURE

COLORSTEEL® ENDURA™ prepainted steel has a ZINCALUME® coated steel base and is available in a range of colours, selected for their ability to provide optimum performance, durability and appeal.

ZINCALUME® zinc/aluminium alloy–coated steel has a 45% zinc, 55% aluminium alloy coating which offers superior corrosion resistance compared to galvanised steel in most environments (particularly coastal environments).

Traditional galvanised steel is offered under the trade name of GALVSTEEL™. This material has a 100% zinc coating and is available in a range of dimensions, grades, zinc coating weights and types.

STEEL FOR FRAMING

AXXIS® Steel for Framing is a brand of galvanised, high-tensile steel supplied for steel frames and trusses, used in residential and similar construction.

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

Where there is a requirement for a very durable product with high aesthetic appeal and low costs of installation and maintenance, then COLORSTEEL® prepainted steel products should be specified.

Each product is designed for application in a specific environment. These applications are discussed under the heading “The New Zealand Building Code” later in this publication.

QUALITY ACCREDITATION

The New Zealand Steel Limited Paint Line received accreditation to ISO 9002 in April 1992 and has subsequently been upgraded to ISO 9001 since July 1993. An on-going programme of continuous improvement will ensure that practice at New Zealand Steel Limited continues to reflect the best available international technology.

DESIGN FOR DURABILITY

Design has a major impact on the durability of the building. A good design will ensure that you will get the best possible life from your building and reduce maintenance costs.

The following design elements are presented alphabetically with guides to provide improved durability.

ANIMAL SHELTERS

Some agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. A corrosive ammonia environment can develop within sheds used for intensive animal farming.

ZINCALUME®, COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ should not be used for this application.

Design Guide:

1. Contact New Zealand Steel Limited for specialist advice.
2. ZINCALUME® STEEL OR COLORSTEEL® SHOULD NOT BE USED IN THIS ENVIRONMENT DUE TO EXTREME CORROSION RISK.

CORROSION

Dissimilar Metals Corrosion

When two different metals are in contact and moisture is present, one metal is relatively protected while the other suffers accelerated corrosion. This is known as galvanic or bi-metallic corrosion. A similar effect commonly occurs with water flowing over dissimilar metals.

This form of corrosion is commonly found:

1. Where water is discharged from copper or brass systems over a galvanised, or COLORSTEEL® prepainted steel or ZINCALUME® coated steel roof.
2. Where unpainted lead flashings are applied directly to ZINCALUME® coated steel products. (Refer Information Bulletin No. 2 “Flashing Materials”).
3. Where fasteners are incompatible with the roofing material. (See Fixings and Fasteners, page 5).

Design Guide:

1. Separate dissimilar metals by using a barrier such as PVC tape, neutral cure silicone sealant or an appropriate paint system.
2. Prevent potential run-off from copper or brass pipes over GALVSTEEL™, ZINCALUME® coated steel or COLORSTEEL® prepainted steel surfaces by diverting the discharge clear of the roofing. Copper pipes must be isolated from AXXIS® Steel for Framing.

Note: Coastal areas with high salt levels and high humidity will increase the possibility of dissimilar metals corrosion.

Compatibility

More Active Metals

ZINC
ZINCALUME®
ALUMINIUM

STEEL

LEAD

COPPER

STAINLESS STEEL

More Noble Metals

This chart lists commonly used metals in a “Galvanic Series”. If any of these metals are in damp contact or a run–off situation, the metal higher on the table will sacrifice itself to protect the metal lower on the scale. Therefore the simple rule is to remember that you can run water down but not uphill. For example, zinc to copper is alright but copper to zinc is not.

RUN-OFF FROM INERT MATERIALS

The zinc coating on galvanised steel products develops a protective surface film as a result of natural weathering. This provides the longevity of performance which we have come to expect from GALVSTEEL™ products.

When flowing over galvanised roofing, rainwater dissolves small amounts of minerals and salts from the zinc surface. These minerals and salts promote and maintain the protective film and enhance the corrosion resistance of downstream galvanised steel products (eg: lean-to roofs, gutters and valleys).

However when rainwater flows over, or is collected from roofing materials which do not promote this protective film (INERT MATERIALS), accelerated corrosion of unpainted galvanised steel roofs and gutters can occur.

Some Examples of Inert Materials:

• ZINCALUME® steel • Glass • Fibreglass • COLORSTEEL® prepainted steel • Glazed Tiles • PVC • Acrylic • Aluminium

Design Guide:

1. On galvanised roofing, run skylights down to the gutter.
2. To achieve maximum life from your rainwater goods we recommend that they are manufactured from either ZINCALUME® steel or COLORSTEEL® prepainted steel products.
3. Unpainted galvanised steel must not be used for roofing or rainwater goods, including valleys and gutters, to collect water run-off from ZINCALUME® coated steel products or any other inert material.

DRINKING WATER

Rainwater collected from roofs clad with products made from GALVSTEEL™, ZINCALUME® coated steel and COLORSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources.

The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts.

Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

EDGE SEALING OF COLORSTEEL® PRODUCTS

Edge sealing of COLORSTEEL® products is not recommended. (See Environmental Categories and Product Recommendations section).

EXPANSION ALLOWANCE AND TEMPERATURE

All roofing and cladding is subject to expansion and contraction due to temperature extremes. This is particularly evident with darker colours and long spans where the expansion may be as much as 8.0mm for a 10.0 metre sheet. Fixing systems must allow for expansion and accommodate the longitudinal movement which results.

Design Guide:

Typical Roof Temperatures Summer Average - Calm Conditions

	INSULATED	UNINSULATED
Light Colours (eg Titania)*	58˚C	48˚C
Medium Colours (eg Mist Green)	79˚C	67˚C
Dark Colours (eg Karaka)	92˚C	77˚C

**Light Colours include unpainted galvanised and ZINCALUME® steel material.*

Typical Roof Expansions

Based on 0.01mm/m/˚C

	8 METRE RUN	12 METRE RUN	18 METRE RUN
Light Colours*	5mm	7mm	11mm
Medium Colours	6mm	10mm	14mm
Dark Colours	7mm	11mm	17mm

FIXINGS AND FASTENERS

The selection of the appropriate form of fastener is a task which should not be solely influenced by cost. Fastener costs are minimal relative to the overall project and there is no benefit to be gained through the use of inferior fixings. The fastener durability should equal or exceed that of the roofing or cladding product.

The “Metal Roofing and Wall Cladding Code of Practice” provides some information on selection, fixing methods and placement of fasteners. This handbook is available on request from members of the New Zealand Metal Roofing Manufacturers Incorporated or New Zealand Steel Limited. More detailed information can also be obtained from fastener manufacturers.

Design Guide:

1. Fastener performance should conform with the requirements of AS3566 (and Amendments) “Screws – Self Drilling for the Building and Construction Industries”.
2. Stainless steel and stainless steel capped fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments due to incompatibility.
3. Low carbon, non conducting sealing washers are required for use with COLORSTEEL® prepainted steel products and ZINCALUME® coated steel products.

   The advice of specialist fastener manufacturers is readily available and these manufacturers should be consulted, particularly where COLORSTEEL® prepainted steel products are to be fixed in Very Severe or Severe Environments. (see Environmental Categories and Product Recommendations, page 15).
4. Fasteners with heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566 Class 3 and 4 are fully compatible with all products.
5. Fasteners used on COLORSTEEL® prepainted steel products should be factory coated to provide an accurate colour match with COLORSTEEL® prepainted finishes.
6. ***Rivets:***

- Use aluminium rivets for joining all New Zealand Steel Limited roofing products. (Ensure rivet is of a suitable strength for the purpose. Refer to your rivet supplier).
- Monel rivets are not recommended as they are incompatible due to their copper content.

Fastener Recommendations

Environmental Category*	ISO	GALVSTEEL™	ZINCALUME®	COLORSTEEL® ENDURA™	COLORSTEEL® MAXX™
Coastal:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Industrial:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Inland:					
Moderate	C2	3	3	3	3,4

NR: New Zealand Steel product not recommended for exterior applications for these Environmental Categories.

4: Heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566.2–2002 Class 4.

3: Heavy zinc or zinc-tin coatings complying with AS3566.2–2002 Class 3.

* See page 16 for definitions of Environmental Categories.

Note:

1. Stainless steel fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments.
2. Sealing washers that contain carbon black filler levels of more than 15% by volume may lead to corrosion of ZINCALUME® steel and COLORSTEEL® prepainted steel products. Therefore, all fasteners for New Zealand Steel roofing products should have low carbon, non-conducting sealing washers.
3. Refer to Information Bulletin 10.

FLUES – DOMESTIC/INDUSTRIAL

Natural gas, wood, coal or oil-fired heaters generate high levels of sulphur compounds. When vented over a roof, particularly in damp conditions, sulphuric acid forms which will lead to premature corrosion of the roof, guttering and downpipes.

Design Guide:

1. Design the height of the flue to allow combustion by-products to be dissipated.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments.
3. Ensure that heaters are run as efficiently as possible to allow complete combustion.
4. Regularly wash the roof to remove contaminants.

FOOT TRAFFIC ON ROOFS

Repeated foot traffic and the dragging of maintenance or cleaning equipment, may damage the roof which will reduce its life expectancy.

Design Guide:

1. Design and install catwalks and platforms over the roof where necessary.
2. Aluminium or galvanised steel catwalks are recommended.
3. Design catwalks and platforms so as not to create an unwashed or ponding area on the roof.
4. Timber catwalks and platforms will cause preferential corrosion of underlying roof.

FUME EXTRACTORS AND VENTS

Corrosive dust and particles can be released through roof vents and discharged onto the roof surface. The immediate area of the roof adjacent to the vent is then at increased risk of corrosion.

Design Guide:

1. Install filter elements to contain hazardous material.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments to be installed adjacent to the vent.
3. Consider applying a suitable protective coating to the affected area of the roof.
4. Maintain coal or oil fired boilers or incinerators so that they do not discharge high sulphur levels over the roof surface.
5. Regularly wash the roof to remove contaminants.

GEOTHERMAL AREAS

In areas of geothermal activity, hydrogen sulphides associated with bore emissions can cause corrosion problems. Although heavier than air, hydrogen sulphide can be drawn into rainwater down-pipes and accumulate in gutters. This can lead to corrosion of the gutters and the roof overhangs.

Design Guide:

1. Install a water trap at the base of down-pipes.
2. Specify the appropriate COLORSTEEL® prepainted steel product.
3. Contact New Zealand Steel Limited for specialist advice.

MIXING OF BRANDS

Where different brands of prepainted material are used on the same building, differences in colour, gloss and weathering performance may appear obvious within a short period of time. This will be due to the different paint formulations used by different manufacturers.

New Zealand Steel Limited will not accept liability for problems caused by the mixing of brands.

Design Guide:

1. Specify either COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ products.

OVERPAINTING OF COLORSTEEL® PREPAINTED STEEL PRODUCTS

COLORSTEEL® prepainted steel products are designed for durability. However, all paint coatings will deteriorate over time. Therefore, at some stage, it will be necessary to repaint to avoid serious deterioration of the product.

The main consideration is the paint coating integrity to perform a suitable bond for the overpainted system so that the durability of the new coating system is maintained.

New Zealand Steel's experience would indicate that this period to first repaint is around 15 years. However, local climatic conditions, building design and paint colour can have a significant influence on the performance of the paint system. Therefore you may need to consult New Zealand Steel or our paint suppliers, PPG Industries NZ Ltd, to help assess the most suitable time to repaint.

COLORSTEEL® prepainted steel products may be readily overpainted, after suitable preparation, for aesthetic reasons. Detailed information is available in the New Zealand Steel Limited Information Brochure: Overpainting New and Weathered Steel Roofing.

PROCESSING PLANTS

(Including Swimming Pools)

Some commercial applications may create internal environments in which the build-up of pollutants or fumes are a potential source of corrosion. Plants where chlorine vapours are released (including enclosed swimming pools) should have adequate ventilation to minimise the risks.

Design Guide:

1. Where pollutants or humidity levels are likely to be high, allow for frequent air changes.
2. Passive ventilation may be inadequate to cope with the problem and the installation of fan systems should be considered and incorporated at the design stage.
3. Contact New Zealand Steel Limited for specialist advice.

PROFILE BEND DIAMETERS – ROOFING, WALL CLADDING AND ACCESSORIES

New Zealand Steel Limited products are custom designed to ensure maximum compatibility with the roll-forming process. The paint systems are designed to be durable and adhere to the metal substrate so that they are not affected by good roll-forming practices. However, tight tension bends in the finished product should be avoided as small cracks may be formed which expose the metal substrate to the atmosphere.

For optimum corrosion performance no visible microcracking should be present in the finished product. There are many factors, substrate, paint, bend diameter and forming practice, that affect the tendency to microcrack. Therefore, it is not practical to have a fixed bend diameter that guarantees no microcracking.

Most products, formed in well designed and operated equipment, will not have microcracks at tension bends. It is important that visual checks for microcracking be made on the finished product to ensure a high quality standard is maintained.

Products with microcracking on the tension bends will show earlier signs of corrosion when used in unwashed areas in severe environments.

Design Guide:

1. The use of corrugated profiles in severe and 'special conditions' (e.g. Geothermal) will help to ensure greater durability.

SOLAR HEATING PANELS OR RUBBER MATS

During the installation of solar heating systems, care should be taken to prevent any damage to the roofing material. Because of the high temperatures created and the increased condensation which may result, care should be taken to maintain an air space between the roof and the heating unit. Follow manufacturers' recommendations concerning tube direction and the use of fixing support brackets.

Failure to do this may invalidate a COLORSTEEL® prepainted steel product warranty.

Design Guide:

1. Never place heating elements or plumbing units directly on the roof surface. Follow the system supplier's recommendations concerning installation.

SWARF STAINING OF ROOFING AND CLADDING

Swarf is the term given to steel debris arising from cutting or piercing operations when using friction saws, abrasive discs, drills etc., on steel roofing and cladding products. Whilst comprising mostly fine steel particles mixed with abrasive, in this context swarf may also be taken to include any other discarded steel objects such as rivet shanks, nails, screws and nuts, which may come into contact with coated products; ie: COLORSTEEL® prepainted steel, ZINCALUME® zinc/aluminium alloy-coated steel and galvanised steel.

Swarf particles, if left on the surface, will corrode and cause rust stains which will detract from the finished appearance of a project. These stains are often mistaken for early deterioration of the roofing and cladding itself.

Design Guide:

1. Never leave swarf material on the coated surface. Follow the recommendations included in the New Zealand Steel Limited Installers Guide or Information Bulletin 7.

UNWASHED AREAS

When contaminants such as windblown salt and dust accumulate on painted surfaces and become damp, corrosion will take place. Many windblown contaminants absorb moisture when exposed to high humidity and their presence on steel accelerates corrosion.

For this reason, areas on a building which are seldom washed by rain are particularly prone to early breakdown of the material.

This effect may first be noticed as a white corrosion product, typically seen on the underside of gutters, canopies, roof vents or on sheltered areas and the underside of profiles used horizontally as wall cladding. It will be more noticeable where tighter radius bends have been used in roll forming.

Even on coated steel where corrosion reactions are much slower, the presence of contaminants over long periods of time will increase the rate of corrosion.

The maintenance regimes for unwashed areas, necessary to meet the durability requirements of the Building Code, are shown on pages 17 and 18 of this publication.

When the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel products is exposed in an unwashed area, e.g.: canopies, verandas, eaves, lean to buildings etc., additional maintenance, above that specified on pages 17 and 18, is required to ensure satisfactory performance of the product.

Design Guide:

1. Every effort must be made during the design of the building to eliminate or minimise sheltered or overhanging areas.
2. Consideration should be given during the design stage to ensure the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel is enclosed and therefore not exposed to the environment.
3. Where unwashed areas cannot be designed out, specify regular washing of these areas as part of an ongoing maintenance programme. Refer to pages 17 and 18 for New Zealand Steel Limited recommendations.
4. Design consideration for easy access must be given to areas that require regular maintenance.
5. Ensure profile bends are not tighter than those recommended under the heading of “Profile Bend Diameters – Roofing, Wall Cladding and Accessories”, and that there are no microcracks in the finished product.

WATER PONDING

Roofs

Where the roof pitch is low, changes in roof loadings may result in a negative pitch and consequently lead to water ponding. Water ponding is detrimental to the performance of COLORSTEEL® prepainted steel products. The following conditions commonly cause water ponding:

- Over-spaced purlins.
- Deformation of timber purlins.
- Placement of external loads such as air conditioning units.
- Rigid fixing on long spans which causes deformation of the profile as a result of thermal expansion.

Design Guide:

1. Never use a pitch of less than 3 degrees or the minimum recommended for the profile, whichever is greater. Pitches of less than this invalidate the warranty.
2. Design the roof according to the profile manufacturer's specifications.
3. On minimum pitch roofs, ensure that the gutter end of profiled sheets is turned down.
4. Allow for thermal expansion to prevent profile distortion.
5. Consider the use of walkways to prevent damage where the roof may be subject to heavy foot traffic.
6. Ensure roof penetrations do not block the flow of water from the roof.

Note: Please refer to "New Zealand Steel Limited Products and the New Zealand Building Code" on page 13 of this publication under "E2/AS1 External Moisture"

Gutters

Gutters must be installed with adequate fall to ensure all water is transported to appropriately located downpipes. Ponding occurs when water remains in the gutter when the fall is inadequate. Over time, this causes degradation to the coating and ultimately leads to gutter perforation. Perforation of the gutter as a consequence of inadequate fall or ponding invalidates both the manufacturer and producer warranties. The installation and downpipe construction should allow the gutter to drain completely.

Regular gutter cleaning and maintenance is required to remove leaves and other debris that may restrict water flow to downpipes. Particular care should be taken at the entrance to downpipes and corners, to avoid blockages leading to water ponding.

A gutter protection system (or any other product) that entraps water between itself and any steel product surfaces, restricting the coated steel's ability to dry, is not recommended and is an exclusion in the product warranty.

WEATHERING OF COLORSTEEL® PRODUCTS

All building products will weather over time. The weathering of COLORSTEEL® prepainted steel products will result in changes to gloss and colour. Factors which influence the change are environmental pollution, UV levels, building orientation and paint colour.

Design Guide:

1. When adding to an existing building, consideration should be given to the weathered appearance of the COLORSTEEL® prepainted steel products in the older part of the building.

NEW ZEALAND STEEL LIMITED PRODUCTS AND THE NEW ZEALAND BUILDING CODE

The New Zealand Building Code defines durability requirements for many elements of buildings. These requirements are outlined in section B2 Durability. In general, most roofing and cladding is required to last a minimum of 15 years (or a nominated period), to water penetration, but in some cases where the material has a structural function, the requirement may be for 50 years. This can be achieved with suitable maintenance.

The New Zealand Building Code calls for durability performance which is relative to both maintenance and to working environments. The following information will assist specifiers to relate these variables to New Zealand Steel Limited products.

CONFORMING WITH THE BUILDING CODE

ZINCALUME® steel and the substrate used to produce COLORSTEEL® prepainted steel products, have met the requirements of AS1397:2001 and are manufactured under a quality management system to monitor ongoing compliance with this Standard. ZINCALUME® steel has been appraised by BRANZ as being suitable as feed stock for the manufacture of roof and wall cladding systems, cladding accessories, spouting, downpipes and other rainwater goods.

EXTERNAL MOISTURE E2/AS1

Adequate Pitch

The New Zealand Building Code provides an Acceptable Solution to the problem of roof pitch. The pitch figures shown in paragraph 8·4·5 of Acceptable Solution E2/AS1 are reproduced, in part, below for your convenience.

Refer specific enquiries to the Profile Manufacturer who may have an Alternative Solution.

ROOF PITCH REQUIREMENTS

Product	Minimum Pitch	
For profiled metal roof cladding	Sheet Length ≤18m	> 18m
Corrugated (with end laps present)	≥ 10°	Refer manufacturer
Corrugated (no end laps present)	≥ 8°	Refer manufacturer
Trapezoidal (where the crest height is less than 27mm)	≥ 4°	Refer manufacturer
Trapezoidal (where the crest height is 27mm or higher)	≥ 3°	Refer manufacturer
Trough profile	≥ 3°	Refer manufacturer

Source: New Zealand Building Code: Acceptable Solution E2/AS1

Note: Where manufacturers have more stringent requirements, these should be followed to optimise performance and to avoid invalidating guarantees.

OUTBREAK OF FIRE

ZINCALUME® steel and COLORSTEEL® prepainted steel need not be separated from flues and chimneys. However, when formed into cladding products and associated accessories that are used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

CONTROL OF EXTERNAL FIRE SPREAD

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into roof cladding profiles are suitable for use as an external roof cladding in all purpose groups in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·1.

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into wall cladding profiles are suitable for use as an external wall cladding on all buildings in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·2a. This statement is conditional on any applied surface finish being no more than 1mm in thickness.

Specifiers should be familiar with the Acceptable Solution C/AS1 Part 7: Control of External Fire Spread, which covers vertical and horizontal spread of fire.

MAINTENANCE

All roofing and cladding products are subject to the cumulative effects of weather, dust and other deposits. Normal rain washing will remove most accumulated atmospheric contaminants from roofs. For wall cladding, manual washing every 3 to 12 months, depending on the paint system, is recommended in moderate to very severe environments to prevent accumulation of dirt, debris or other material not removed by rain washing. For areas that do not receive any or adequate rain washing (called unwashed areas) such as soffits, wall cladding under eaves, underside of gutters, fascias, sheltered areas of garage doors and unwashed roof areas, more extensive manual washing is required. Similarly, other High Risk areas, around flues, under television aerials or overhanging trees and sites prone to mould, lichen, bird droppings or debris, need to have regular manual washing.

Regular washing of COLORSTEEL® prepainted steel products increases the durability by reducing attack from airborne salts and pollutants. GALVSTEEL™ products and ZINCALUME® steel products will also benefit from routine washing.

COLORSTEEL® prepainted steel surfaces should be manually washed with water and a sponge or a soft nylon-bristled brush. For large areas it may be more appropriate to use water blasting at pressures up to 20MPa.

Overpainting of COLORSTEEL® prepainted steel products is discussed on Page 8 of this publication.

If New Zealand Steel Limited products are maintained according to the following recommendations, the requirements of the New Zealand Building Code B2 for 15 year durability for roofs and exterior walls will be met or exceeded.

Note:

1. The New Zealand Building Code durability requirement does not include aesthetic appearance.
2. The New Zealand Building Code requires a durability of 15 years minimum (with maintenance) for roofing, including valleys, and wall cladding products. This means no moisture penetration due to product failure.
3. The New Zealand Building Code requires a durability of 5 years minimum (with maintenance) for rainwater products, gutters and downpipes. This means no perforation due to product failure.
4. New Zealand Steel Limited products are designed to exceed the New Zealand Building Code B2: durability requirements. Continued maintenance and overpainting will greatly extend the ultimate life of all products.
5. Where a 50 year durability is required **OR** where a product is to be used in aggressive internal environments, New Zealand Steel Limited should be consulted.
6. In Industrial Environments, the type of pollution generated may alter the above recommendations. If in doubt, consult New Zealand Steel Limited.

The following maintenance information in the Environmental Chart is for guidance only.
Each proprietary building product should carry its own manufacturers' recommendations for usage.

New Zealand Steel Limited will not accept responsibility for proprietary roofing and cladding products which do not conform to our recommendations for manufacturing, environmental use or maintenance.

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

Important: As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.

The following four pages present a guide to New Zealand's environmental categories, the products recommended for specific conditions and residential roofing warranties.

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

INTRODUCTION

New Zealand has a wide range of environmental conditions, from the harsh West Coast beaches, to the relative shelter of the Waikato farming region. Therefore, New Zealand Steel Limited offers a range of steel products which are suitable for most locations.

VERY SEVERE – ISO CATEGORY 5

50m from high water on East Coast, 100m from high water on West Coast.

Characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf (typically 50-100 metres) such as is found on exposed coasts.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

SEVERE – ISO CATEGORY 4

Characterised by:

- Light salt deposits.
- A frequent smell of salt in the air.
- Typically starts 100-500 metres from breaking surf such as is found on exposed coasts.
- In the immediate vicinity of large expanses of calm salt water such as harbour foreshores.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

MODERATE COASTAL – ISO CATEGORY 3

Characterised by:

- Little or no salt deposits.
- The occasional smell of salt in the air.
- Typically starts 500-1000 metres from breaking surf such as is found on exposed coasts, OR in the immediate vicinity of calm salt water such as estuaries.

MODERATE INLAND – ISO CATEGORY 2

Characterised by:

- No obvious marine or industrial influences.
- Typically more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

COMMERCIAL WARRANTY

Such as schools, warehouses and buildings, refer to New Zealand Steel Limited for details of commercial warranties. Maximum warranty offered on commercial buildings is 15 years.

IMPORTANT

- As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.
- Gutters should be installed according to manufacturer's instructions.
- Unwashed and high risk areas – manual washing every 3 months.

0 metres **50 metres**

COLORSTEEL® Maxx™ COLOUR FOR THE EXTREME		COLORSTEEL® Endura™ COLOUR FOR THE FUTURE		Zincalume®		GALVSTEEL™	
Greater than 50m from breaking surf on the East Coast. Greater than 100m from breaking surf on the West Coast.							
WARRANTIES	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 3 months.						
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every month.						
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every month.						
15 years: covering the paint surface against flaking, peeling and excessive fade. **20 years:** against perforation as a result of corrosion.	• Rain washing	**15 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing	Not recommended	Not recommended	Not recommended	Not recommended
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.	**Not recommended**	• Rain washing plus manual washing every 6 months.				
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.	**5 years:** covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.				
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.	**5 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.				
15 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing	**18 years:** covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing	**15 years:** against perforation as a result of corrosion.	• Rain washing	No warranty applies	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.	**15 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.	**15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.		• Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.		• Manual washing every 3 months. Painting may be advisable depending on the specific location.
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.		• Manual washing every 3 months. Painting may be advisable depending on the specific location.

VERY SEVERE COASTAL | **SEVERE COASTAL** | **MODERATE COASTAL** | **MODERATE INLAND**

100 metres | **500** metres | **1000** metres

SPECIAL ENVIRONMENTS

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas. They include:

1. **Geothermal Areas**
   Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define. Please consult New Zealand Steel Limited for further details.

2. **West Coast, South Island**
   In this area, smoke from the coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® prepainted steel coating. The effects of a severe coastal environment aggravate the situation.

   This area combines the most severe features of both industrial and coastal environments. Please contact your local supplier for the best COLORSTEEL® prepainted steel product to use.

3. **Internal Environments**
   Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds used for intensive animal farming. Please consult New Zealand Steel Limited for further details.

4. **Industrial Environments**
   Close to corrosive industrial emissions and subject to heavy fallout from them. Please consult New Zealand Steel Limited for further details.

Further Assistance
Further advice on the selection of the appropriate product to suit your particular location can be obtained from New Zealand Steel Limited or your local COLORSTEEL® prepainted steel supplier.

VERY SEVERE SPECIAL ENVIRONMENTS

COMMERCIAL WARRANTIES

Commercial warranties are issued through the Rollformer by New Zealand Steel Limited and the terms are specific to each contract.

In order to ensure the appropriate product is specified for the intended service life in any given environment, New Zealand Steel Limited is keen to be consulted as early as possible in the design stage to ensure correct material selection and backing by an appropriate warranty.

Warranty applications are generally made through the roofing manufacturer and warranty periods and conditions are assessed by New Zealand Steel Limited.

Factors such as roof design, roof pitch, profile, coating type, internal and external environments and special conditions (such as requirement for “Clean in Place”) are all assessed at the time of the warranty application. Maintenance requirements will be specified as part of the warranty.

Draft warranties are available from New Zealand Steel Limited to support tenders for specific projects. The terms and conditions of the draft will remain unchanged providing that the terms of the project are unaltered.

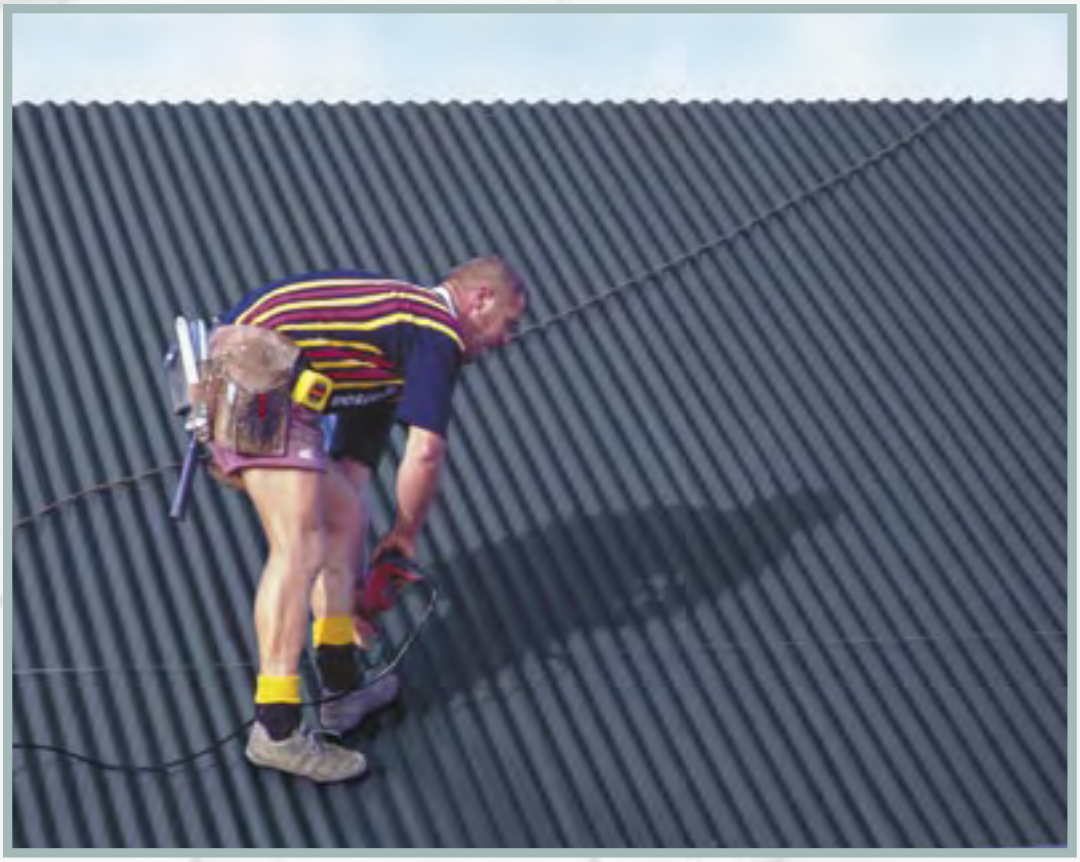
A warranty is issued on the satisfactory completion of the contract. Installation must be carried out in accordance with New Zealand Steel Limited’s requirements and according to good trade practices as detailed in the “Metal Roofing and Wall Cladding Code of Practice”.

A site inspection by New Zealand Steel Limited may be carried out prior to the issuing of any warranty.

The maintenance programme specified in the warranty must be complied with to validate the warranty.

INSTALLATION INFORMATION

Details relating to the installation of all products are provided in the “Installers Guide”. This booklet covers New Zealand Steel Limited’s recommendations for handling, cutting, fixing, sealing, site storage, etc. Additional copies of this publication may be obtained from New Zealand Steel Limited.



INFORMATION TO HELP YOU AVOID PROBLEMS

In almost all applications, ZINCALUME® coated steel and COLORSTEEL® prepainted steel will out-perform galvanised steel. There are however, a small number of applications for which galvanised steel is more suitable.

ZINCALUME® coated steel and COLORSTEEL® prepainted steel products must not be used for:

- Formwork in contact with wet concrete.
- Products to be embedded in concrete. However, where very small volumes of concrete are involved (e.g. splashes) which are able to cure quickly, there is little corrosive effect.
- Fertiliser storage sheds and containers.
- Culverts, or where ZINCALUME® coated steel material is buried in the ground.
- Water tanks.
- Highly alkaline environments (e.g. cement manufacture).
- Coolroom products.
- Buildings for intensive animal farming.

TECHNICAL FEATURES

CORROSION PROTECTION

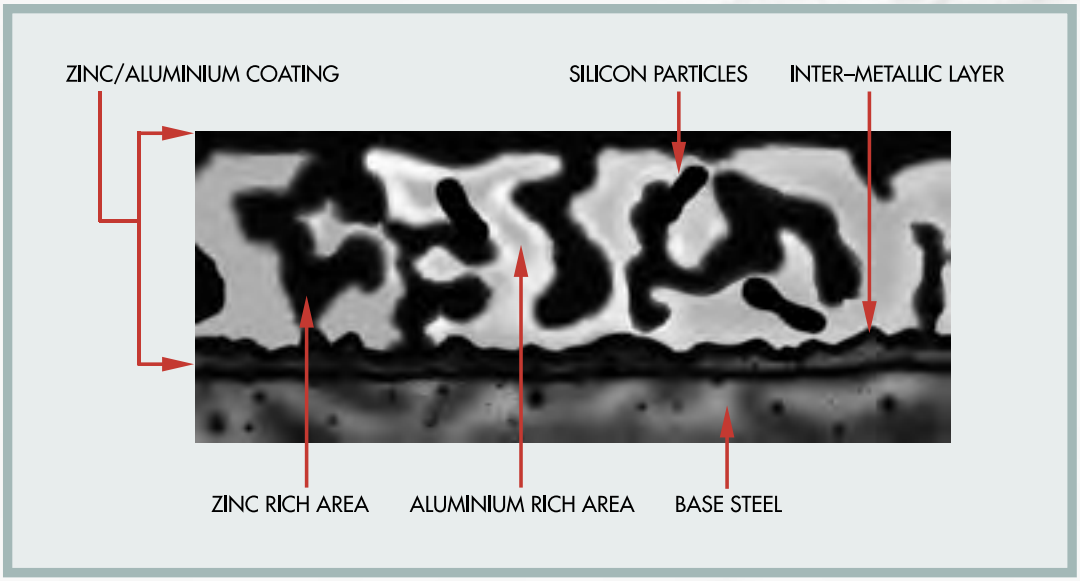
The long established method of protecting steel against corrosion has been to apply a coating of zinc (galvanising). The zinc surface forms a hard, impervious layer which limits further corrosion. This provides for the longevity of performance which we have come to expect from galvanised steel products.

The zinc coating also possesses another very useful property. Small exposed surfaces of the underlying steel such as scratches or cut edges do not corrode because of an effect known as sacrificial protection.

ZINCALUME® steel, a zinc/aluminium alloy coating, provides a superior performance to that of galvanised steel. It combines the barrier protection of aluminium and the sacrificial protection of zinc, thus giving the best of both worlds.

It follows that by coating these substrates with an added paint system, the steel core will be protected for a longer period. It is for this reason that the COLORSTEEL® prepainted steel coating systems were developed. Each coating is designed to protect the substrate from specific environmental conditions.

Cross Section of ZINCALUME® Coated Steel



UV PROTECTION

New Zealand experiences some of the most extreme UV conditions in the world. UV light can cause breakdown of the resin used in some paints. This leads to erosion and chalking of the paint film. UV light can also cause the breakdown of pigments (particularly organic based pigments) resulting in fading.

In response to this threat, an on-going programme of product improvement has led to the formulation of the current COLORSTEEL® prepainted steel paint systems. These systems utilise pigments and resins which have been selected for their colour stability, flexibility and durability.

PROFILE DESIGN INFORMATION

Specifications relating to roofing and cladding profiles and pricing details should be sought from the specialist roofing manufacturers concerned. **New Zealand Steel Limited does not provide a rollforming service.**

Profile designs from your local supplier will specify the grade and BMT appropriate to any contract.

Definitions

1. BMT: Base metal thickness is the thickness of the uncoated steel core. The finished thickness of the material will increase by the accumulation of coatings during manufacture by New Zealand Steel Limited.
2. Grade: The mechanical strength of the steel substrate is expressed in yield strength values measured in MPa. Low strength steel may be rated as G1, G250 or G300. As the yield strength of the material increases, so do the values, so that G550 has the highest strength.
3. Span: The distance between purlins, as recommended by the Rollformer for each particular profile.

ZINCALUME®

Steel Cladding.

HOW TO SPECIFY NEW ZEALAND STEEL LIMITED ROOFING AND CLADDING PRODUCTS

- Product (ZINCALUME®, GALVSTEEL™, COLORSTEEL® ENDURA™, COLORSTEEL® MAXX™)
- Profile
- Colour (Where applicable)
- BMT (eg: 0.40 or 0.55mm)
- Grade (eg: G300 or G550)

FURTHER COATING/SURFACE OPTIONS

In addition to the products making up the standard COLORSTEEL® prepainted steel product range, New Zealand Steel Limited produce non-standard coatings for special applications (eg: high reflectance finishes). For specialised options please contact New Zealand Steel Limited.

FURTHER INFORMATION

For additional information, literature or technical assistance, please contact:

COLORSTEEL® and ZINCALUME® Marketing
New Zealand Steel Limited
Private Bag 92 121, Auckland 1142
Telephone: 0-9-375 8999
Facsimile: 0-9-375 8213
Free Phone: 0800 100 523
Email Address: info@colorsteel.co.nz
http://www.colorsteel.co.nz

Zincalume®
ZINCALUME® is a registered trademark of BlueScope Steel Limited.

GALVSTEEL™
GALVSTEEL™ is a trademark of New Zealand Steel Limited.

AXXIS® STEEL FOR FRAMING
AXXIS® is a registered trademark of New Zealand Steel Limited.

COLORSTEEL® MAXX™
COLOUR FOR THE EXTREME
MAXX™ is a trademark of New Zealand Steel Limited.

COLORSTEEL® ENDURA™
COLOUR FOR THE FUTURE
ENDURA™ is a trademark of New Zealand Steel Limited.

COLORSTEEL®
COLORSTEEL® is a registered trademark of New Zealand Steel Limited.

COLORSTEEL®
THE ROOF OF NEW ZEALAND®
is a registered trademark of New Zealand Steel Limited.

NOTE: With New Zealand Steel Limited's commitment to continuous improvement, information provided in this publication may be subject to modification. At the time of publication we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique, equipment or statement to reflect improvements in the manufacture and application of coil coated products. The information is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of any conflict between this information and the standard terms and conditions, the standard terms and conditions shall prevail.

This edition of the New Zealand Steel Specifiers and Builders Guide supersedes all previous editions.

NEW ZEALAND STEEL 100% RECYCLABLE
Kiwi to the core

NEW ZEALAND STEEL

NEW ZEALAND MADE

New Zealand Steel Limited, Private Bag 92 121, Auckland 1142, New Zealand. Ph 0-9-375 8999 Fax 0-9-375 8213

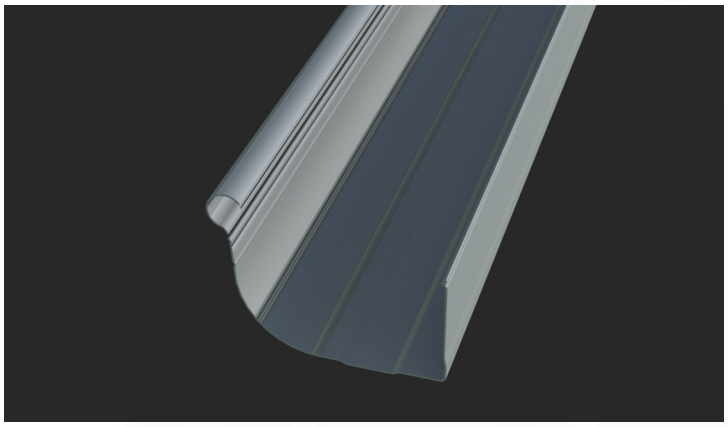
GUTTER

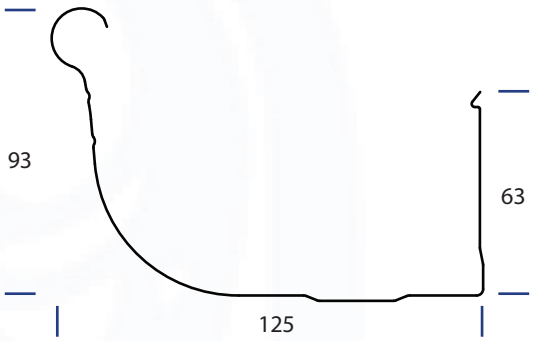
Metalline Quad Gutter

In Christchurch product is known as Colonial Quad Gutter

Metalline Quad Gutter is our most popular residential profile. Whether you are renovating or involved in a new build, this profile will enhance the appearance of your home. The Metalline system uses concealed brackets and is compatible with Metalcraft Metalline Fascia or timber fascia. Metalline Quad Gutter is available with overflow slots to prevent flooding from blockages, and snow straps are stocked to suit this profile if required. Metalline Quad Gutter is available in Zincalume, Galvsteel, Colorsteel Endura and Colorsteel Maxx.

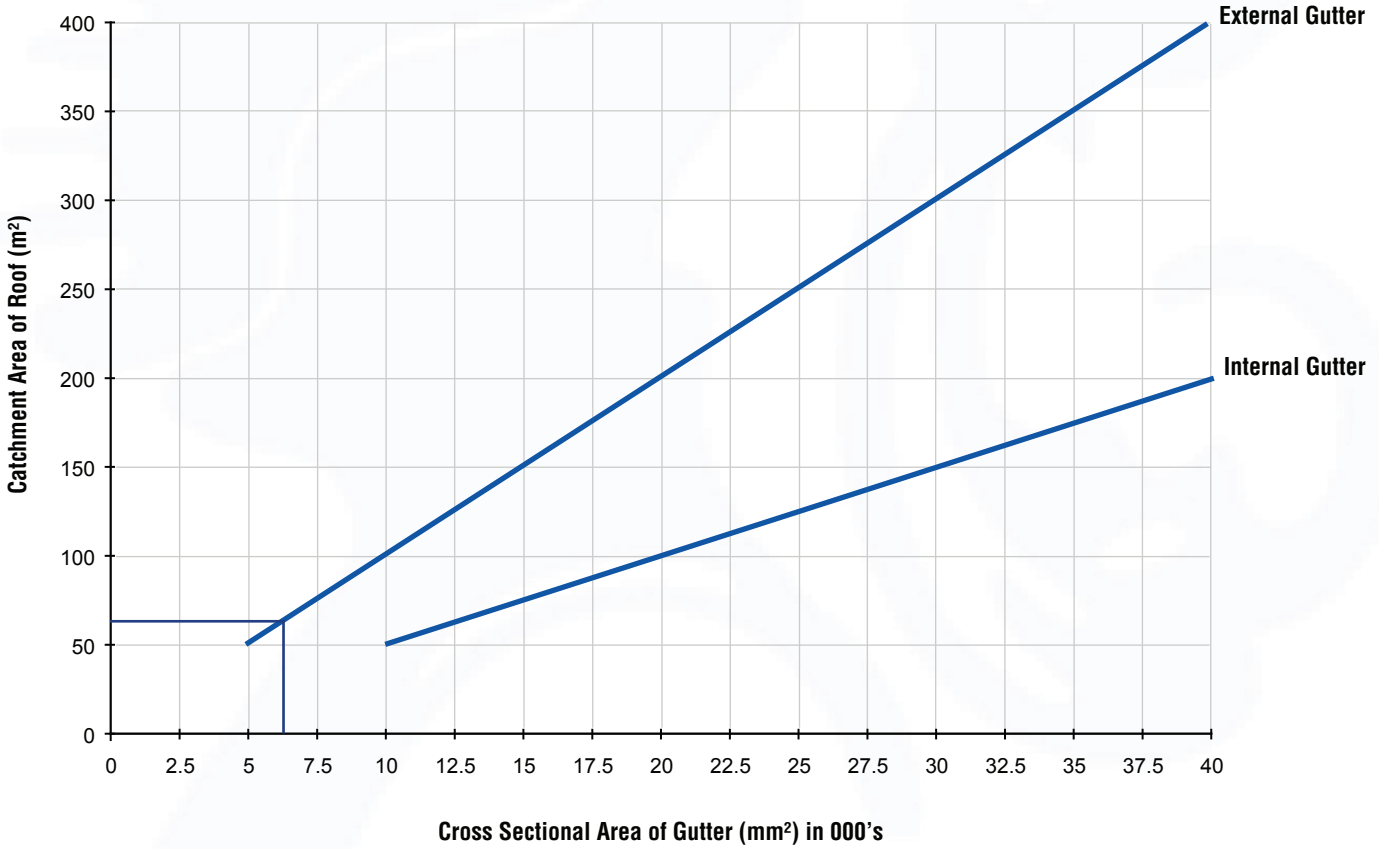
Cross-sectional Area: 5550mm²





all dimensions are nominal

Catchment Area of Roof v Cross Sectional Area of Gutter



Note: The graph is based on a rainfall intensity of 100mm / hour and roof pitches less than 10 degrees.
For more information on roof catchment areas and the effect of gutter cross sectional areas download the document on Roof Drainage

Manufacturing Locations Hamilton, Christchurch

Metalline Quad Gutter is available for purchase from all Metalcraft branch locations www.metalcraft.net.nz

GAS SPECS

LPG Association of New Zealand

LPG Association Code of Practice
LPGA COP No 2

Installation and maintenance of twin 45kg LPG cylinder systems

July 2014





LPG Association of New Zealand Inc
PO Box 1776
Wellington
New Zealand

Foreword

The performance of LPG cylinder installations is a critical element in ensuring that gas is supplied to appliances reliably and safely. This Code of Practice has been compiled with advice and input from across the industry in New Zealand and from international authorities. The Code of Practice captures the latest knowledge and design features gained from operating experience and investigative work conducted by the LPG Association.

The purpose of this Code of Practice is to:

- Assist with the reduction of phthalates from LPG systems.
- Assist with the removal of condensate at the regulator.
- Assist with the selection of suitable equipment and fittings.
- Assist with recommendations on equipment maintenance.

It should be read in conjunction with AS/NZS 5601.1.

It is intended that gas fitters will use this Code as a best practice guide for the installation and maintenance of domestic and commercial twin pack installations.

Table of Contents

Section 1: Scope, Interpretation, Definition and General

1.1 Scope

This Code of Practice sets out the requirements for installation and servicing of domestic and commercial 45kg twin cylinder LPG installations.

1.2 Definitions

For the purposes of this code the following definitions shall apply:

Accessible:

Access can be gained without hazard or undue difficulty for inspection, repairs, testing, maintenance, renewal or operational purposes.

Breather vent:

An orifice or opening designed to permit atmospheric pressure to act on the diaphragm of a regulator.

Condensate:

The liquid that separates from the gas down stream of any regulator due to the reduction in temperature resulting from pressure reduction.

Condensate trap (also known as a drip leg or tailpipe):

A device installed in a gas line to trap the condensate liquid.

EPA: Meaning the 'Environmental Protection Authority'.

Gasfitting:

Has the same meaning as in the Plumbers, Gasfitters and Drainlayers Act 2006.

Gas load:

The total gas consumption of all downstream appliances.

Gas Pressure Regulator:

A device that automatically regulates the outlet pressure of the gas passing through it to a predetermined value.

Automatic Change-Over Regulator:

Combination valve / first stage gas pressure regulator, fitted to a LPG multiple-cylinder installation which will automatically change over from a cylinder in use to a reserve cylinder at a predetermined pressure. May be included in a one piece automatic changeover valve assembly comprised of automatic changeover valve, first and second stage regulators and may incorporate pressure relief or over pressure shut off capability.

HSNO:

Hazardous Substances and New Organisms Act 1996.

LAB number:

Number allocated by EPA when a cylinder is approved.

Lock-up pressure:

The maximum pressure in an installation when the regulator has closed and all appliances are shut down.

Non Return Valve:

A valve designed to operate automatically to prevent reversal flow in a pipe or fitting.

Phthalates:

Plasticisers mainly DOP (DiOctyl Phthalates) predominantly found in hose inner liners.

POL fitting (Prest-O-Lite):

The common name given for a standard union with left hand thread, used for connection to a 45 Kg cylinder.

Pigtail:

A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.

Pressure:

Pressure as measured above atmospheric pressure, also called gauge pressure.

Twin cylinder installation:

A cylinder installation where the cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

REFERENCED DOCUMENTS

AS/NZS 5601.1	Gas Installations
AS/NZS 1596	The storage and handling of LPG
AS/NZS 1869	Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas
UL144	LP- Gas regulators
UL252, AGA 205	Compressed gas regulators
NF M 88-769	1977 Commercial Propane Installations In Movable Containers – Coupling And Automatic Changeover Device – Construction – Operation – Tests

Section 2: Selection criteria for LPG Cylinders, Pigtails, Change-over valves and Regulators

2.1 Cylinders

(a) All cylinders must comply with the requirements of the EPA's Guide to Gas Cylinders.

(b) Cylinders filled for use in LPG installations must be stamped with an LAB or LABSP number and a current test date.

(c) Consideration should be given to ensure that the demand of the appliances to be connected to the system can be supplied by a 45kg cylinder. As a guide on NZ LPG mix, a 45kg cylinder is capable of supplying a duty cycle of 1kg/50MJ over the period of 1 hour. The instantaneous demand can exceed this rate for short periods. Table J2 of As/NZS 5601.1 provides more guidance on withdrawal rates for propane.

2.2 Pigtails

Refer to clause 4.6 of AS/NZS 5601.1

2.3 Changeover Valves

(a) Changeover valves can be manual or automatic, and may include a non-return valve on each pigtail connection. The valve must comply with the requirements of the Authority.

(b) Changeover valves may be comprised of a first & second stage regulator system in a single body, or as a combination of separate component items.

2.4 Regulators

(a) Regulators shall comply with the requirements of the EPA "Guide to Gas Cylinders".

(b) Regulators shall comply with the requirements of section J6 of AS/NZS 5601.

(c) Consideration must be given to the total expected gas load when sizing the regulator.

(d) A single stage regulator or the first stage of a mult-stage regulator shall be located so that the length of the piping that is subject to cylinder pressure is as short as practicable.

2.5 Condensate Trap

Condensate traps remove condensate and prevent transfer downstream of most condensates present in the LPG. A condensate trap should be installed between the first and second stage regulator if they are separate items. If the regulator is the combined type then a condensate trap should be installed immediately after the regulator.

(a) Condensate traps must have a vertical limb in a direct line to the first stage regulator and be of a minimum volume of V=N X 5.5 where: V – The volume of the vertical limb in Milliliters (ml) N – The number of 45kg cylinders.

(b) The trap must have a plug or other means of removing the condensate.

Examples of length of condensate trap tube for 10 and 13 mm pipe and various numbers of cylinders.

Number of 45 kg cylinders	Length 10 mm pipe	Length 13 mm pipe
Two	140 mm	88 mm
Four	280 mm	180 mm
Six	370 mm	240 mm
Eight	560 mm	350 mm

2.6 Non-return valves

Where the regulator does not prevent LPG flowing across the changeover system, a non-return valve shall be fitted either in each pigtail connection of the changeover valve, or as part of each pigtail.

2.7 Excess flow valves

For flexible pigtails manufactured to AS/NZS 1869 an appropriately sized excess flow valve must be fitted immediately after the outlet of each cylinder valve. The excess flow valve can be an integral part of the pigtail assembly.

Section 3: Location of Cylinders

3.1 Location of Cylinders

Refer to section J3 of AS/NZS 5601.1

3.2 Requirements for cylinder deliveries

Cylinder installations should be located such that the delivery of gas can be made safely by one person without excessive manual handling or risk to customers property. In situations where the following conditions cannot be satisfied, other options such as locating the cylinders remotely and piping to the installation should be considered.

(a) Cylinder installation must be designed to be capable of accommodating the size of cylinder intended for use, for either exchange or insitu fill applications.

(b) A minimum distance of 600mm should be provided between front of the cylinder installation and other structures to allow adequate access for the cylinder delivery to be made.

(c) The cylinder compound should be accessible by cylinder trolley.

(d) Paths should have a minimum width of 600mm.

(e) Steps should have a minimum of 2: 1 tread depth to tread rise. Maximum tread rise should be 125mm.

(f) Steps should not exceed 1.5m total rise.

(g) Paths should not exceed 20 deg gradients.

(h) Total distance from cylinder delivery truck parking area and cylinder installation should not exceed 75m.

(i) It must be possible to legally and safely park the truck while making the delivery.

(j) Access route should be firm and compact with adequate grip even in wet conditions.

(k) The access route should not be over delicate or decorative surfaces such as terracotta.

Section 4: Location and Installation of Cylinders

Refer to section J4 of AS/NZS 5601.1.

4.7 Clearances around Cylinder

Refer to section J5 of AS/NZS 5601.1

4.8 Cylinder Safety Valve Discharge

Refer to section J6 of AS/NZS 5601.1

4.9 Regulators

Refer to section J6 of AS/NZS 5601.1

4.10 Test Points

Refer to section J6 of AS/NZS 5601.1

Section 5: Maintenance of twin LPG Cylinder Installations

5.1 Cylinders

Cylinders should not be filled unless they have been tested and certified within the last ten years.

5.2 Flexible Pigtails manufactured to AS/NZS 1869

(a) Pigtails should be inspected visually for cracks and deterioration every time the cylinder is exchanged or filled.

(b) Pigtail connections should be checked with a soapy solution every time the cylinder is changed or filled.

(c) Pigtails should be replaced six years from the date of manufacture.

5.3 Change-over Valves

Changeover valves should be checked for correct operation in accordance with manufacturers recommendations or in the absence of any recommendation, at least every ten years.

5.4 First Stage Regulators

(a) The first stage regulator to be checked for correct operation in accordance with the manufacturers recommendations, or in the absence of any recommendation at least every ten years.

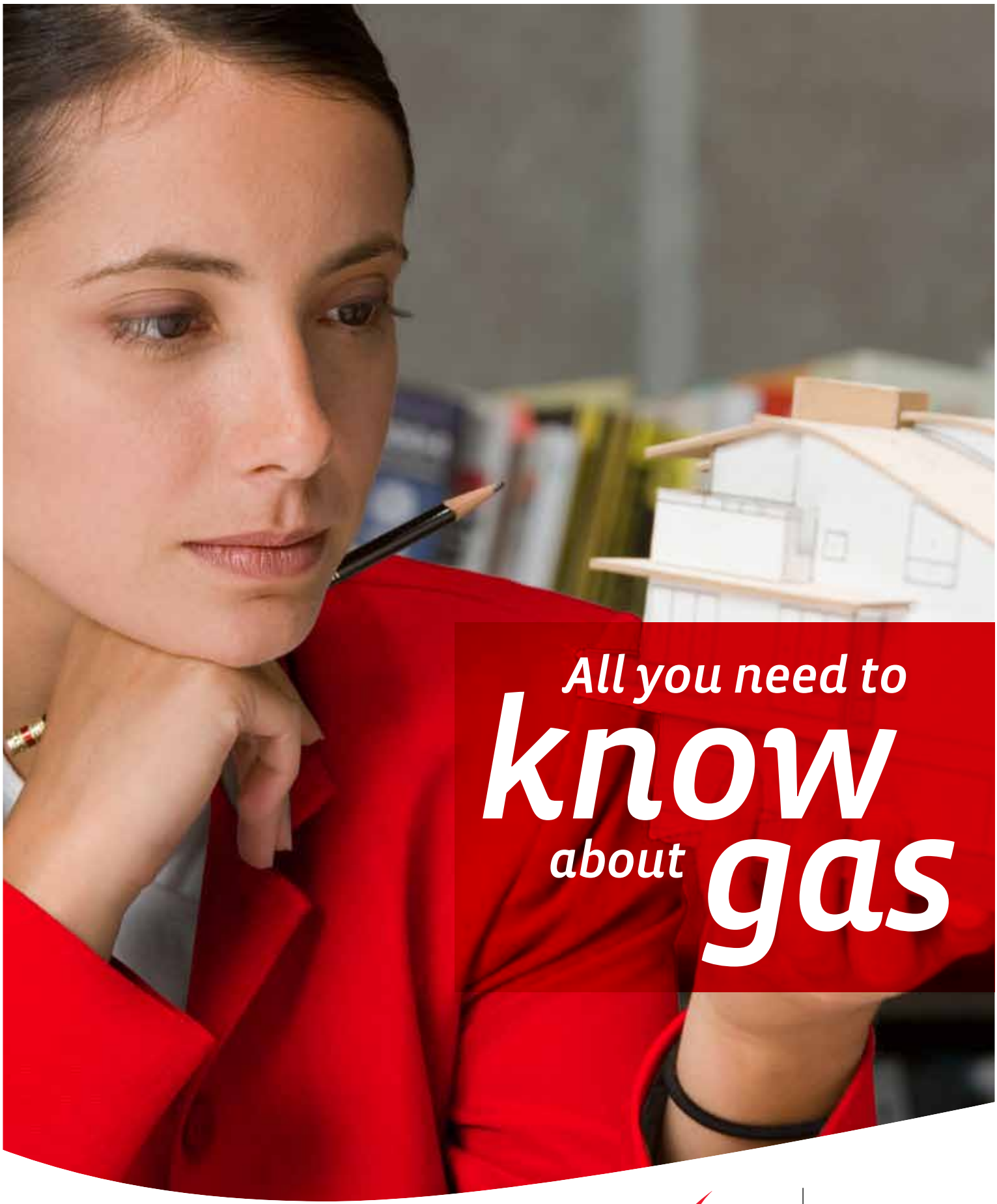
(b) The condensate trap to be drained by removing the drain plug provided) at intervals not exceeding two years, and at every visit of the Gas fitter.

5.5 Second Stage Regulators

The second stage regulator to be checked for correct operation in accordance with the manufacturers recommendations, or in the absence of any recommendation, at least every ten years. The rubber diaphragm and rubber seat must be inspected for deterioration and replaced if necessary.

5.6 Condensate Traps

Condensate traps should be emptied whenever any work is carried out on the installation and at least every 2 years. **NOTE** For the quantities of residue expected to be found in the condensate traps, between 2 to 3 ml maximum, use disposable gloves when emptying the residue into absorbent material. The used absorbent material and the gloves can then be disposed of in general waste.



All you need to know about gas

Contact Energy • February 2010

We're here to help

Whether you're working with clients who are well informed about their energy choices or they're looking to you for guidance, we can help you make good decisions about energy services. That's because we have all the energy options covered – electricity, natural gas and LPG. We'll give you honest, upfront advice on the most efficient options for your project. As well as that, our DualEnergy™ discount means we can offer your customers instant savings if they choose a combination of electricity and natural gas (including Contact Rockgas LPG).

Of course, a supply of electricity is essential from day one of any building project, but the extensive benefits, widespread availability and lifestyle benefits of natural gas and LPG are good reasons to give careful consideration to gas applications as part of the design process.

This guide focuses on the technical requirements for specifying natural gas and LPG. We want to make sure you have all the information you need at your fingertips when you're specifying a new building or advising clients about major renovations.

Please get in touch with us if you want a hand with your design plans for electricity and/or gas services. We have an experienced team ready to help. We'll work with you to make the process easy and straightforward for you and your clients.

Here's how you can get in touch with us:

Phone:	0800 401 234 Monday to Friday, 8.30am to 5.30pm (excludes public holidays)
Email:	energyprojects@contactenergy.co.nz

Benefits of gas

Residential

Hot water

Continuous flow systems

Continuous flow hot water systems can be fuelled by natural gas or LPG. They offer a host of benefits:

:: Economy – Water is heated to the required temperature at the time it's needed. Your client only pays for the hot water they use, not to store hot water they don't need.

:: Continuous supply – Everyone in the house benefits from an endless supply of hot water, no matter how many showers, baths, dishwashing or laundry cycles are run.

:: Control – A digital controller makes it easy to set the temperature. There are no cool surprises in the shower, and it keeps everyone safe from scalding themselves.

:: Space saving – Removing the need for a hot water cylinder means you'll have more space to play with.

Storage systems

These systems are good for situations where clients have a steady demand for hot water throughout the day. They are also ideal where clients have specialist bathroom fittings that demand maximum water pressure, for example massage shower heads. In areas where there is intermittent electrical supply, a storage cylinder is a reliable provider of hot water as no electricity is required. We recommend you contact manufacturers such as Rheem for more information.

Home heating

Ducted central heating

Ducted central heating is an easy way to heat an entire home. It also offers space saving and clean lines through discreet flush-mounted outlets. A digital controller allows the user to tailor the warmth in each room, and for year round comfort, dual cycle units are available for air conditioning.

Flame-effect fires

Nothing beats a gas flame-effect fire. No wood or coal to store, no grate to clean, just heart-warming live flames to make the room the ultimate 'snuggle up' zone.

There is a huge choice of appliances in a wide range of styles, including inserts to convert existing fireplaces into super-clean realistic wood fires.

Radiant heating

Radiant heating is like the sun – the flames heat ceramic elements, which warm rapidly, pushing the heat out into the room. Radiant heaters are ideal for heating larger rooms quickly.

Forced convection heating

Forced convection heaters take in cool air and pump out warm air, circulating it outwards and upwards. Forced convection systems suit a variety of room environments and are ideal for heating all of the air in a room at an equal temperature.

Indoor cooking and outdoor lifestyle

Indoors

Almost every professional kitchen in New Zealand runs on gas. Only a gas flame allows for precise temperature control and infinite heat settings. In an instant, the temperature can go from cold to hot and back again.

Outdoors

There are many options now available for outdoor heating to create the perfect outdoor environment all year round. Wall-mounted or canopy-mounted heaters can be installed onto a reticulated gas network or to a Rockgas Cylinder HomePack.

Commercial

Hot water systems

Gas is a clear winner for heating water. It's ideal for:

- meeting capacity and peak demand
- quick heating of stored cold water
- reducing costs through operating efficiency
- fuelling continuous flow appliances, which eliminates storage losses
- light to heavy demand range.

Water heating appliances come in a range of sizes. Smaller units are suited to small retail businesses, such as hair salons. Mid-sized appliances cater for applications like apartment blocks, dairy sheds, sports facilities and motels. The largest appliances are designed for businesses like large hotels, hospitals, production processes and commercial laundries.

Talk to one of our sales specialists who can assess your requirements and recommend the appliance and installation option that delivers the best solution.

Laundries

To run at peak efficiency, commercial laundries require a reliable supply of very hot water (usually 82°C). Gas-fired hot water systems are your best option. These range from continuous flow units for smaller systems, to high efficiency gas storage units for larger needs, right up to gas-fired boilers for hot water and/or steam generation.

Space heating

Gas heating offers instant, controllable and economic heat at a good price. It's ideal for heating cold, draughty commercial and industrial premises or where precise temperature control is required to optimise crop yield or livestock production. Potential savings can be achieved by combining the inherent economics of gas with thermostats and other electronic controls.

Radiant heating

Radiant heat is like the heat from the sun: it heats objects in its path so you feel warm, even if the surrounding air is cold. This makes radiant heating ideal for spot-heating draughty areas, such as warehouses.

Air conditioning

Air conditioning appliances perform the same function as heat pumps. Their efficient heating and cooling power has seen them become a popular choice for administrative areas, function centres and hospitality sites.

Forced convection heating

Forced convection air heating systems heat the air in a building. They can be direct-fired, indirect-fired or hot water systems. The very wide range of applications for these systems range from heating single rooms or showrooms through to large buildings, schools, rest homes, factories, warehouses, glasshouses and livestock sheds.

Cooking

Gas is indispensable in a commercial kitchen. Only a gas flame allows for precise temperature control and infinite heat settings. In an instant, the temperature can go from cold to hot and back again.

Drying

Gas-fired laundry equipment for drying and ironing is an ideal choice for any business, from the smallest laundromat or motel, to the largest hotel or hospital. Gas-fired clothes dryers save up to 50% over electricity (depending on tariff). In addition, these highly efficient units can dry large loads up to 20% faster than other fuelled dryers.

Gas options and installation

We can supply gas almost anywhere in New Zealand. Natural gas is available to many parts of the North Island through the reticulated network. We also offer a wide range of LPG options and can supply most of the country through our Contact Rockgas branches and franchises. These include the popular HomePack (two 45kg cylinders), multi-cylinder banks, bulk tanks or connection to our commercial and residential reticulation networks in Christchurch, Queenstown and Wanaka.

Reticulated gas

Networks

Natural gas

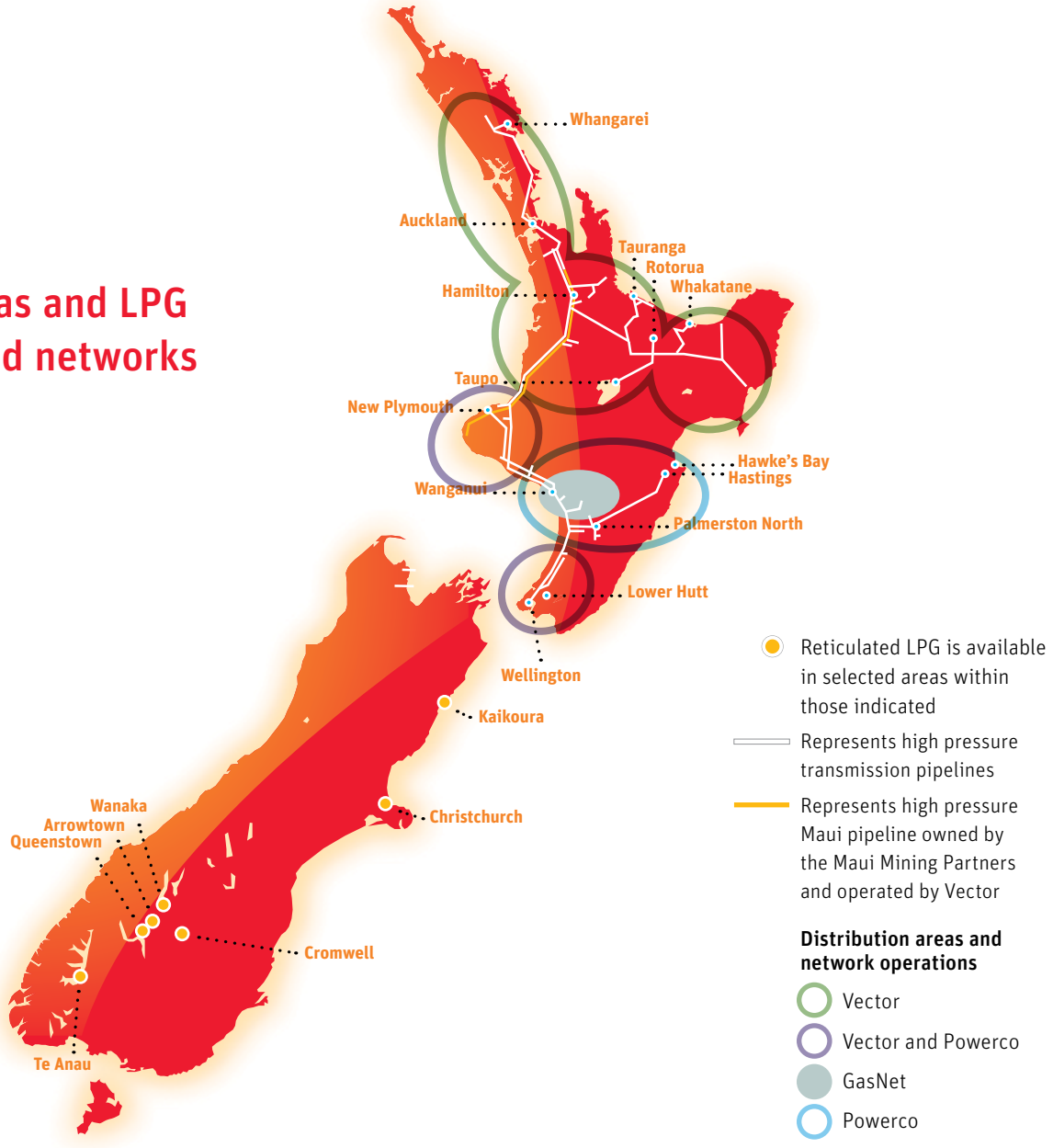
You might be surprised to learn just how widely available piped gas is in New Zealand. The map below shows the coverage of the various natural gas networks, plus our LPG reticulated networks.

LPG networks

Over ten years ago, New Zealand's first major LPG reticulation supply was developed by Rockgas (now part of Contact), with extensive networks in Christchurch and the southern lakes area including Queenstown and the Wanaka area. These networks continue to expand in line with demand. Businesses, in particular, have welcomed these developments. With no peak electricity demand charges to pay, many have been able to reduce their energy costs. Others have been able to reduce smog and pollution by replacing coal, diesel or light fuel oil with cleaner burning LPG.

Reticulation makes sense for large LPG users, offering the convenience of a gas main fuel supply and more efficient use of space by eliminating the need for storage tanks. Contact is currently working on extending its LPG networks to other selected areas.

Natural gas and LPG reticulated networks



Installation

Installation requirements for gas distribution systems are set by the NZ Standard *NZS5258:2003 Gas Distribution Networks*. This covers natural gas and LPG pipelines. This section provides a general overview of the methods used to install pipelines. You can find more detail about the specific requirements for a Rockgas installation in the *Rockgas Construction and Maintenance Manual*. Just email energyprojects@contactenergy.co.nz, and we'll send you a copy.

The two common methods for installing gas distribution systems are directional drilling and open trenching. One of our engineers can help you work out which option is best suited to your project.

Directional drilling

This is the most common form of trenchless installation and uses a mechanical 'mole' to tunnel below ground. The benefit is that only two small holes need to be dug – one at each end of the pipeline – so there is very little disturbance. The downside is the potential for serious damage to existing underground services. Extreme care needs to be taken.

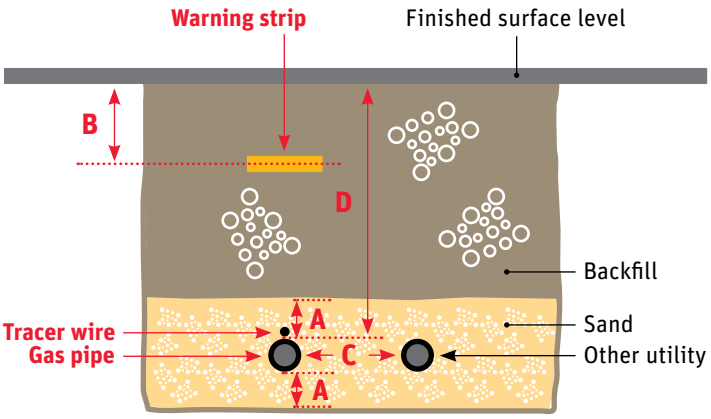
Open trenching

Open trenching involves digging a trench on site to install the gas pipe. It's often used in new developments where all underground services are installed together.

Open trenching can be used through existing streets and is useful in stony areas where directional drilling is not possible. However, it is an expensive option. This is because traffic control, the water table and existing services can make the installation difficult.

Typical services trench*

This diagram shows the specific clearances that need to be met when digging a services trench:



A Sand bedding for pipes 63mm and below – 50mm. 100mm sand bedding for pipes larger than 63mm.

B Warning strip to be located between 150mm and 300mm of the finished surface level.

C Lateral separations when running parallel with other utilities for service connections and mains 200mm diameter and below:

Telecom	200mm
Water	200mm
Storm water	200mm
Sewer	200mm
Other gas	200mm
Power 240V and 400V	300mm
Power >400V	500mm

Minimum lateral separations when running parallel with other utilities for mains above 200mm diameter:

Telecom	300mm
Water	300mm
Storm water	300mm
Sewer	300mm
Other gas	300mm
Power 240V and 400V	300mm
Power >400V	500mm

When crossing other services, a minimum vertical separation of 100mm is required.

D Depth of cover required:

	Mimimum depth of cover	Maximum depth of cover
Inside boundary	500mm	1400mm
Local road 63–200mm diameter	800mm	1400mm
Local road >200mm diameter	1000mm	2000mm
Transit road	1000mm	2000mm

Note: Installation depths outside these ranges may be approved by the engineer on a case-by-case basis.

Gas meters

Gas meters are also known as Gas Measurement Systems (GMS). They are made up of a meter, regulator, filter, isolation valves, fittings and covers.

Residential gas meters

Meter sizes vary depending on the Maximum Hourly Quantity (MHQ) of the appliances installed. Standard gas meters sit proud of the outside wall (usually by 250mm), but in-built mounting kits are available. This gives you the option of partially or fully recessing the meter. This option is particularly useful for houses clad in polystyrene, which don't provide adequate fixing for a standard meter.

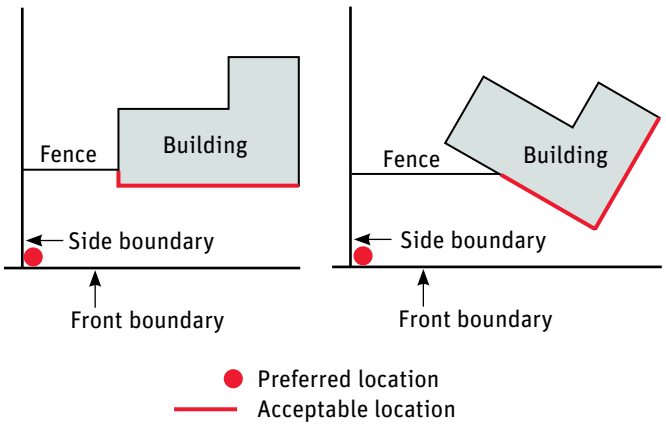
There are specific safety rules for the location of a gas meter. It must be mounted on a wall between 150mm and 2000mm above ground level on the front of the building or within 3000mm of either side. The gas regulator vent also needs to be positioned away from doors and windows, electricity meters and flue terminals. Specific clearances are given in the diagrams on the right.

Please get in touch with us if you would like more details on the types of residential gas meters available.

Commercial and industrial gas meters

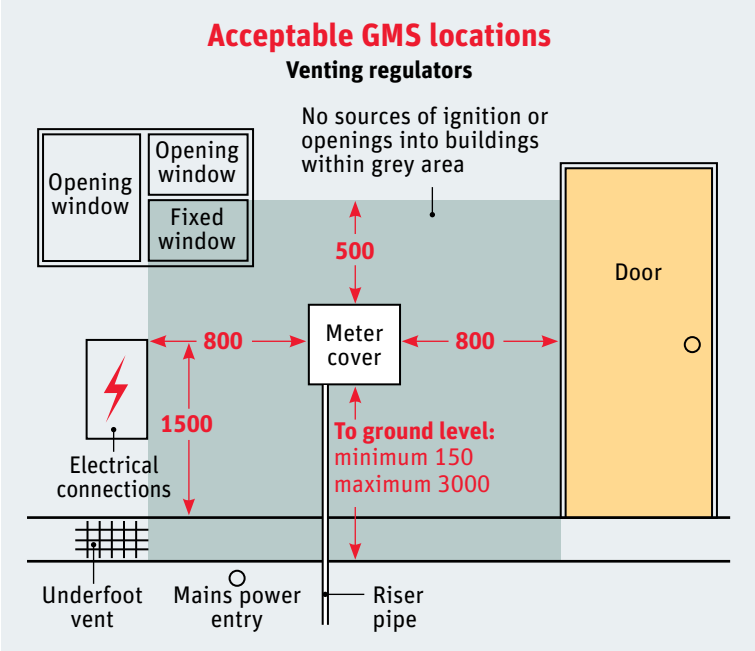
Again, there is a range of commercial and industrial gas meters. The right meter for your project will depend on the likely gas load and the MHQ. We'll work this out for you by assessing the capacity of the equipment you are installing, the gas supply and metering pressure, and factors such as whether the site will use peak or constant loads.

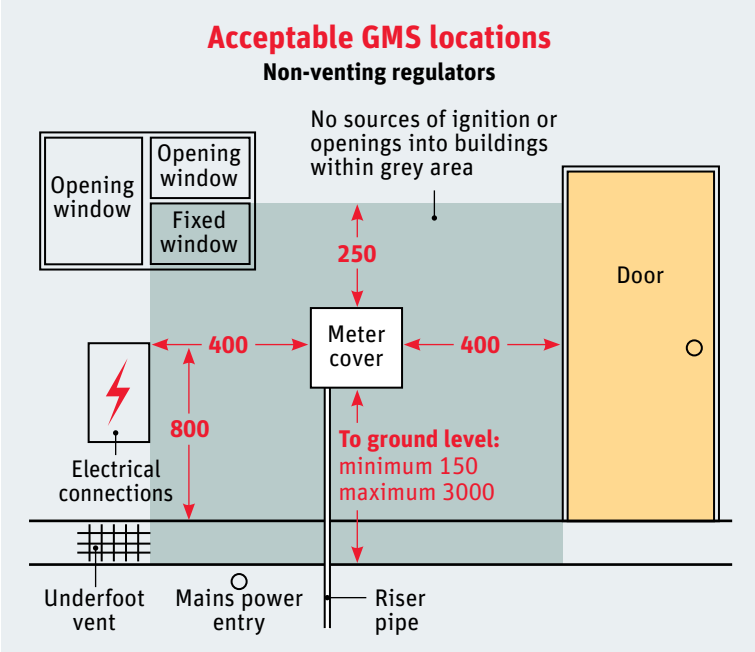
The location will depend in part on the type of meter. Meters are usually installed close to the property boundary. If this is not possible, the meter needs to be located in a well ventilated room on an external wall of the premises, sealed off from the building and accessible from the street.



GMS locations

These diagrams show where gas meters can be located and required clearances. It's a good idea to check the retailer and network requirements, plus the NZ Standards *5258:2003 Gas Distribution Networks* and *5259:2004 Gas Measurement* for more information on acceptable meter locations.





All measurements are in millimetres.

LPG cylinders

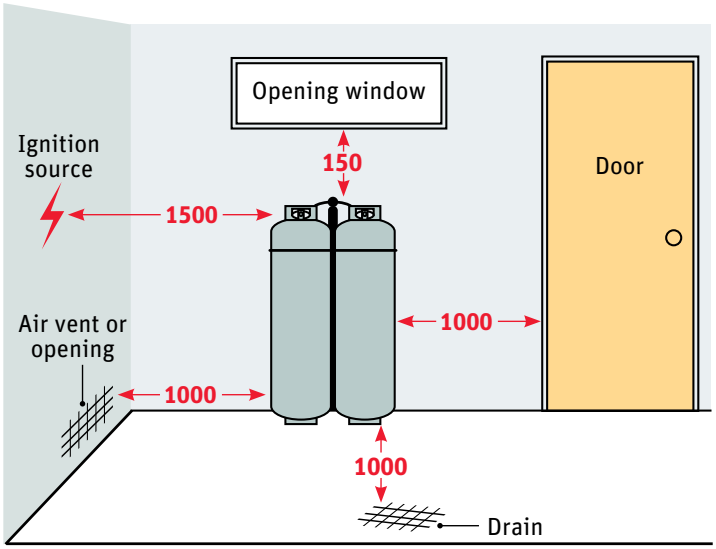
Contact Rockgas HomePack

This system is very popular in a residential setting and for small businesses. The HomePack consists of two 45kg cylinders delivered and connected by us. When the first of the two cylinders is empty, the customer orders a new one, and we exchange the empty cylinder for a full one. We will also undertake a safety check every time we visit. Almost all gas appliances can be connected to a HomePack.

Each gas installation requires a gas fitting certificate issued by a craftsman gasfitter before the gas can be turned on and is available for use.

Choosing a site

This diagram shows the clearances for location of a HomePack.



All measurements are in millimetres.

Each cylinder measures 1260mm high x 360mm wide. We suggest you allow a width of 400mm per cylinder.

Cylinders sit on a concrete slab and are secured with two hooks and a chain. The concrete slab must be at least 50mm above ground level (even if there is a poured concrete pad).

What about site conditions as well?

Installation requirements are covered under NZ Standard *5261:2003 Gas Installation* appendix G1 to G6.

Cylinder refills

Your client will want to know how much LPG they can expect to consume each year. Use this table as a guide.

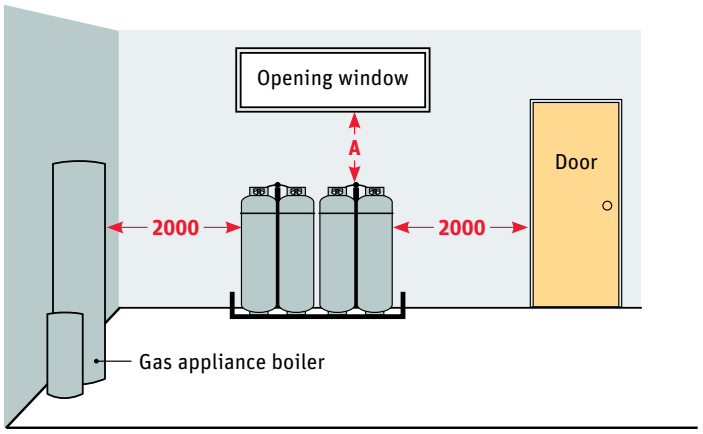
Use of gas	Gas heating	Gas hot water		
		2 person family	4 person family	6 person family
Refills per year	6–9	4–6	6–9	9–12

Multiple 45kg cylinder installation

Multi-cylinder installations are available for commercial connections or large residential connections. These are housed in their own station or cage and can be located anywhere on the property, as long as the area is accessible for delivery, and meets all compliance requirements. Piping is laid from the building to the installation.

Rules on the placement and number of cylinders on site are set out in the Hazardous Substances and New Organisms (HSNO) Act. A Location Test Certificate is required if a site has more than 100kg of LPG storage. This is issued by the Test Certifier employed by the customer and must be approved before cylinders are installed. The customer will also be required to have an approved handler on site.

This diagram shows the clearances for multi cylinder installations if located against a building.



All measurements are in millimetres.

A = 150mm for exchange cylinders or 500mm for cylinders filled on location. The measurement is taken from the top of the cylinder valve.

Bulk tanks

Large industrial and commercial customers may have the option of a bulk supply. Bulk tanks are used for a wide range of applications from horticultural activities, such as heating greenhouses, to running machinery on chicken farms and for laundry activities in the hotel industry.

With a bulk supply, LPG is delivered underground through artificial vaporisers from a bulk storage vessel located on the customer's site. Talk to us if you'd like to explore this option. We can help size your project and advise you on isolation distances and legal requirements.

Ventilation and flueing

The installation requirements for gas burning appliances and equipment are set out in NZ Standard *5261:2003 Gas Installation*. This code of practice covers the important considerations of ventilation and flueing.

All gas flued appliances give off burnt gases that result from the combustion process. These gases are discharged into the atmosphere via metal ducts (flues).

Fresh air also has a role to play in the combustion process, which is why adequate ventilation is needed for gas appliances to work efficiently. Good air flow is also required to circulate heated air within a room to maintain an even temperature.

For these reasons, it's important to follow the manufacturer's specifications when choosing and positioning an appliance. Take note of recommended room sizes: an appliance will not perform well if it is installed in a room that is smaller or larger than it was designed for.

There are certain rooms e.g. bedrooms and bathrooms where gas appliances are unable to be installed. Please refer to *NZS5261:2003*.

Legislation and standards

Industry standards/codes of practice

We've written this document to help make sure gas distribution systems are designed, installed and maintained in a safe manner. The requirements and information set out in this specification are not intended to be all encompassing but they do provide firm guidelines for Contact/Rockgas activities. All activities need to comply with the Standards and requirements set out here or issued in writing by us or our duly appointed agent.

All work must comply fully with statutory and local authority regulations. It is the responsibility of the contractor to maintain a good knowledge of Acts, Regulations, Standards, local body and Transit requirements and any amendments that may be issued from time to time.

Standards New Zealand offers an online library service you can use to select the relevant Standards you need. The online library is automatically updated with revisions and amendments to Standards as soon as they're published, so you can be confident you're viewing the most recent version. There is a subscription fee for using this service. See www.standards.govt.nz for more information.

Charges

A number of factors influence what your client is charged for the convenience of gas in their home or business.

Reticulated gas

- Possible metering service installation charges
- Monthly energy account fees and usage
- Appliances and their installation

LPG cylinders

- Cylinder station set up charges (concrete pavers, chain set, regulator, regulator cover and hoses)
- Cylinder rental fees
- Cylinder gas refills (this depends on the delivery area as well as how much gas is used)
- Appliances and their installation

Our energy partnership

Our energy partnership is the formal process we have in place for tailoring energy requirements for commercial clients. The aim is to provide customers with creative fuel solutions aimed at reducing total energy costs. First, we undertake an energy needs analysis. This provides the information we need to:

- design, build and commission all aspects of the installation, including obtaining all necessary resource consents and regulatory requirements
- provide initial and ongoing training for the client's managers
- provide a reliable and flexible fuel supply
- appoint a skilled and experienced LPG specialist to supervise the customer's account and provide ongoing service and support systems for the installation.

No job is too big, and you might be surprised to know the extent of the help available. We'll work alongside you to understand the aspects of your project that affect energy management. We can develop a detailed cost comparison, fuel supply and installation proposal. We can design, build and commission all aspects of the installation, including obtaining any resource consents and approvals. We can also recommend the best-fit gas appliances and coordinate with suppliers where we do not supply them ourselves.

Most of all, you can count on us to provide a reliable fuel supply and to deliver to your requirements.

While this guide focuses on gas installations, remember we're willing and able to help you with all aspects of all energy services design, including LPG, natural gas and electricity.

Getting in touch

We look forward to working with you to achieve the best possible outcome for you and your customer.

If there's anything you want to talk to us about that is not specifically covered in this manual, or that you want further clarification on, please contact us.

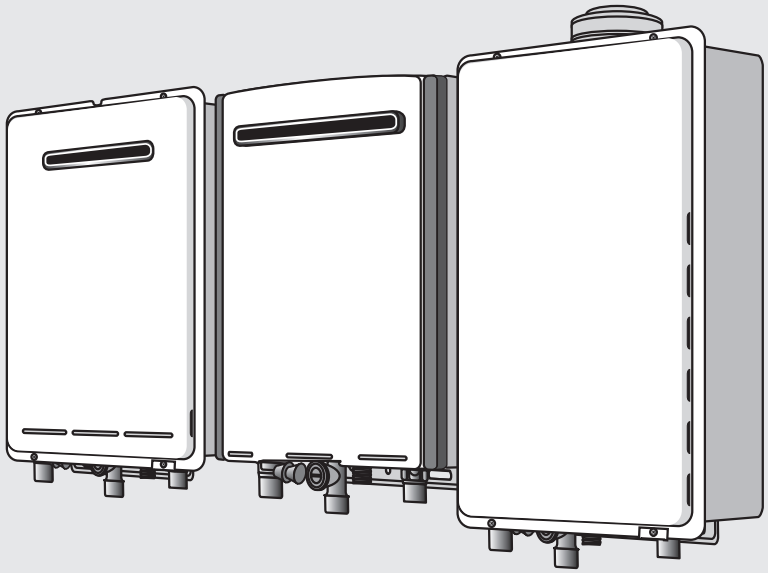
Here's how you can get in touch with us:

Phone:	0800 401 234 Monday to Friday, 8.30am to 5.30pm (excludes public holidays)
Email:	energyprojects@contactenergy.co.nz

Rinnai
EXPERIENCE OUR INNOVATION

Continuous Flow Water Heaters

Installation Manual



To suit models:

Rinnai Infinity VT16	REU-VR1620WG	Rinnai Infinity HD200	REU-VRM2632WC
Rinnai Infinity VT20	REU-VR2024WG	Rinnai Infinity HDi200	REU-VR2632FFUG
Rinnai Infinity VT24	REU-VR2426WG	Rinnai Infinity HD250	REU-VR3237WG
Rinnai Infinity VT26	REU-VR2626WG	Rinnai Infinity EF24	REU-K2430WG
Rinnai Infinity VTa26	REU-VR2626WGT	Rinnai Infinity EF250	REU-KM3237WD
		Rinnai Infinity EFi250	REU-KM3237FFUD

i = internal
a = aggressive water

Models are not suitable as a spa or swimming pool heater.

Internal Rinnai continuous flow internal water heaters ('i' models) must be installed with an approved Rinnai flue system.

Appliance must be installed, commissioned and serviced by a licensed tradesperson in accordance with these instructions and all applicable local rules and regulations.

Your Rinnai continuous flow water heater complies with NZS 5262. A declaration to this effect can be found on the Energy Safety web site; www.energysafety.govt.nz.

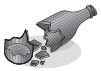
Contents

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

For assistance or additional information contact Rinnai on 0800 TO RINNAI (0800 86 746 624).

Before installation



Unpack appliance and flue components (if applicable) and check for damage. DO NOT install any damaged items.

Check all components have been supplied and that you have the correct gas type.

Read these instructions to get an overview of the steps required before starting the installation. Failure to follow these instructions could cause a malfunction of the appliance. This could result in serious injury and property damage.

For Rinnai continuous flow water heaters used in solar installations, refer 'Recommended Solar System Layout'.

The Rinnai Infinity EF models are 32 kg. Please use care when lifting and seek assistance if required.

This appliance must be installed in accordance with:

- Current AS/NZS3000, AS/NZS3500, NZS 5261 and G12/AS1
- Rinnai installation instructions
- Local regulations and municipal building codes

Installation, service and removal must be by an authorised person only.

Applicable models

These installation instructions apply to the following Rinnai continuous flow water heaters.

Rinnai Infinity VT16	External	REU-VR1620WG
Rinnai Infinity VT20	External	REU-VR2024WG
Rinnai Infinity VT24	External	REU-VR2426WG
Rinnai Infinity VT26	External	REU-VR2626WG
Rinnai Infinity VTa26	External	REU-VR2626WGT
Rinnai Infinity HD200	External	REU-VRM2632WC
Rinnai Infinity HDi200	Internal	REU-VR2632FFUG
Rinnai Infinity HD250	External	REU-VR3237WG
Rinnai Infinity EF24	External	REU-K2430WG
Rinnai Infinity EF250	External	REU-KM3237WD
Rinnai Infinity EFi250	Internal	REU-KM3237FFUD

i = internal
a = aggressive water unit

Appliance location

Installation in environments free from corrosive compounds

Air surrounding the water heater, venting and vent termination(s) is used for combustion and must be free from compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/varnishes, and refrigerants. Therefore Rinnai recommends outdoor models be used for these locations where possible. The water heater, venting and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds.

If it is necessary for a water heater to be located in areas which may contain corrosive compounds, Rinnai strongly recommends the following:

Indoor/internal water heaters:

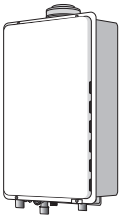
- DO NOT install in areas where contaminated air is present
- Consider before installation where air has the ability to travel within the building
- Chemicals that are corrosive in nature should not be stored or used near the water heater
- Where possible, install the water heater in a sealed closet so that it is free of contaminated indoor air

Outdoor/external water heaters and vent terminations of indoor/internal water heaters:

- Install as far away as possible from exhaust vent hoods
- Install as far away as possible from air inlet vents—corrosive fumes may be released through these vents when air is not being brought in through them
- Chemicals that are corrosive in nature should not be stored or used near the water heater or vent termination

Damage and repair due to corrosive compounds in the air is not covered by warranty.

Internal models



Internal models are designed for indoor installations only. They may be installed in an enclosure if the requirements of NZS 5261 are satisfied. An enclosure is defined as a compartment, enclosed area or partitioned off space primarily used for the installation of the appliance. If installed in an enclosure either internally or externally, the location should be ventilated to allow gas to dissipate.

They must be mounted on a vertical structure with the water and gas connections on the underside pointing downwards. For appliances installed in roof spaces or elevated structures, specific requirements apply. Refer to NZS 5261 section 1.6 for details.

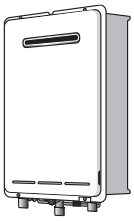
This appliance MUST be used with an approved Rinnai flueing system. The use of a non-Rinnai flueing system may result in a dangerous situation and violates regulations.

This appliance must be located so that the flue terminal exits the building at a suitable point, refer 'Minimum Clearances Required for Flue Terminals', NZS 5261:2003.

Manufacturer's instructions for model REU-KM3237FFUD (EFi250); for reference j, gas appliances over 200 MJ/h input, use ≥ 300 mm.

Appliance location

External models



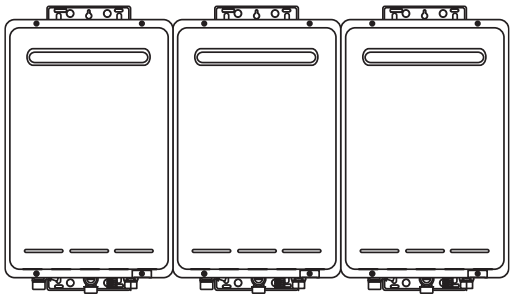
External models are designed for outdoor installations only. They must be located in an above ground open-air situation with natural ventilation, without stagnant areas, and where gas leakage and products of combustion are rapidly dispersed by wind and natural convection.

They must be mounted on a vertical structure with the water and gas connections on the underside pointing downwards. For appliances installed on elevated structures or under floors specific requirements apply. Refer to NZS 5261 for details.

This appliance must be located so that the flue terminal exits the building at a suitable point, refer 'Minimum Clearances Required for Flue Terminals', NZS 5261:2003.

Manufacturer's instructions for model REU-KM3237WD (EF250); for reference j, gas appliances over 200 MJ/h input, use ≥ 300 mm.

When multiple units of the same model are installed on the same vertical face, with the flue terminals at the same height, they can be installed next to each other (as shown).



All models

This appliance must be placed as close as possible to the most frequently used hot water outlet or outlets to minimise the delay for hot water delivery.

For installations where the distance between the water heater and the outlets is considerable, a flow and return system can be used to minimise the waiting time for hot water delivery. Alternatively, multiple appliances can be strategically placed to serve different outlets. Contact Rinnai for further information.

An AC 230 V, 10 Amp, earthed power point must be provided adjacent to the appliance. For outdoor installations, this power point must be weatherproof. It must be clear of the gas and water connections to the appliance and also the flue exhaust and water pressure relief valve. The power cord of the appliance is 1.5 m long.

All appliances must be installed to ensure access can be gained without hazard or undue difficulty for inspection, repair, renewal or operational purposes. Sufficient clearances shall allow access to and removal of all serviceable components.

Appliances should not be mounted higher than 3.5 m above the ground or floor level unless the customer can arrange permanent and safe access or can provide another means of access such as scissor or boom lifts.

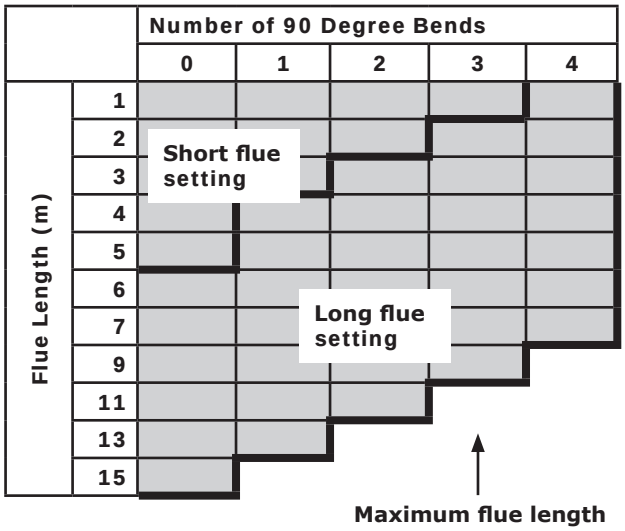
General installation information

Catch pan

It is important a suitably drained catch pan is fitted (especially for internal units) where damage could be caused by discharge from the water heater. Provision must be made for safe disposal of any leaking water to an external location.

Flued water heaters (internal units)

The chart below highlights the maximum flue length and number of bends. It also shows the difference between a short and long flue—this is important if changing settings (dip switches).

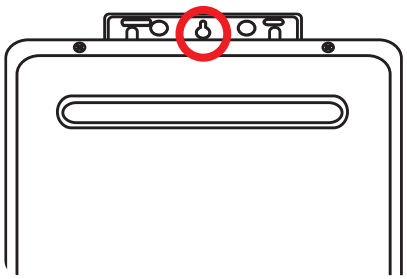


Mounting the appliance

Refer 'Connections and Fittings' for individual appliance weights. The wall or structure on which these units are to be mounted must be capable of supporting these weights and the associated pipe work.

Ensure suitable fixing screws or bolts are used to secure the units to the walls, in accordance with NZS 5261 (section 5.0). Wooden plugs shall not be used.

The top bracket has a keyhole slot (circled below) so the appliance can be positioned by hanging it on one screw while the other screws are secured.



General installation information

Pipe sizing

Refer 'Connections and Fittings' for appliance gas consumption. If the gas pipe sizing is insufficient the customer will not get the full performance benefit. Gas pipe sizing must consider the gas input to this appliance as well as all the other gas appliances in the premises. The gas meter and regulator must be specified for this gas rate. An approved sizing chart such as the one in NZS 5261 should be used.

Water pipe sizing and layout should be performed in accordance with AS/NZS3500. All hot water pipe work should be insulated to optimise performance and energy efficiency.

Water delivery temperature

Local regulations and/or requirements of AS/NZS3500.4 must be considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene. The temperature of these areas may be limited to 55 °C or less.

If the appliance is to deliver water primarily for the purposes of personal hygiene in an early childhood centre, school, nursing home or similar facility as defined in AS/NZ3500.4 a Temperature Limiting Device (TLD), such as a Tempering Valve may be required (even if the appliance is set to 55 °C or less). For these types of applications contact Rinnai.

Requirements for Rinnai Continuous Flow Units Installed Without Controllers

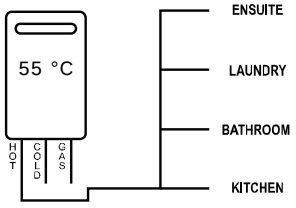


Diagram 1 - 55 °C Appliance

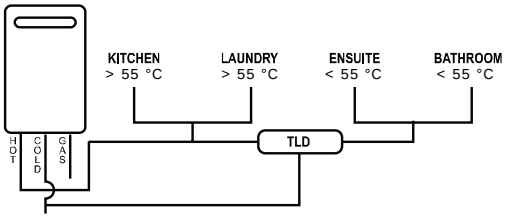


Diagram 2 - Not a 55 °C Appliance
(TLD = Temperature Limiting Device)

When the continuous flow unit is set to deliver water at a temperature higher than 55 °C, it will be necessary to fit a Temperature Limiting Device for delivery to areas used for the purposes of personal hygiene. Refer Department of Building and Housing G12.

Water supply

Refer 'Connections and Fittings' for applicable water pressures. Approved pressure limiting valves may be required if the stated maximum rated water supply pressures are exceeded. To achieve the rated flow, the stated minimum water supply pressures must be supplied. The water heaters will operate at lower pressures but will not achieve the rated flow.

Water chemistry and impurity limits are stated in our detailed warranty statement. Most metropolitan water supplies fall within these requirements. If you are unsure about the quality of the water, please contact Rinnai and we will provide you with the details of an authorised agency who are able to test your water for compliance to Rinnai standards. If sludge or foreign matter is present in the water supply, a suitable filter or strainer should be incorporated in the water supply to the water heater.

Connections and fittings

Models	Gas Consumption MJ/h	Water Supply kPa		Weight kg	Fittings			Condensate
		Min.	Max.		Hot	Cold	Gas	
VT16 Ext REU-VR1620WG	125	120	1000	15	R½ (15 mm)	R½ (15 mm)	R¾ (20 mm)	
VT20 Ext REU-VR2024WG	160	160	1000	16	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VT24 Ext REU-VR2426WG	188	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VT26 Ext REU-VR2626WG	199	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VTa26 REU-VR2626WGT	199	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HD200 Ext REU-VRM2632WC	199	140	1000	21	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HDi200 Int REU-VR2632FFUG	195	140	1000	21	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HD250 Ext REU-VR3237WG	250	200	1000	29	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
EF24 Ext REU-K2430WG	162	240	1000	27	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)
EF250 Ext REU-KM3237WD	211	240	1000	32	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)
EFi250 Int REU-KM3237FFUD	211	240	1000	32	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)

Service connection points

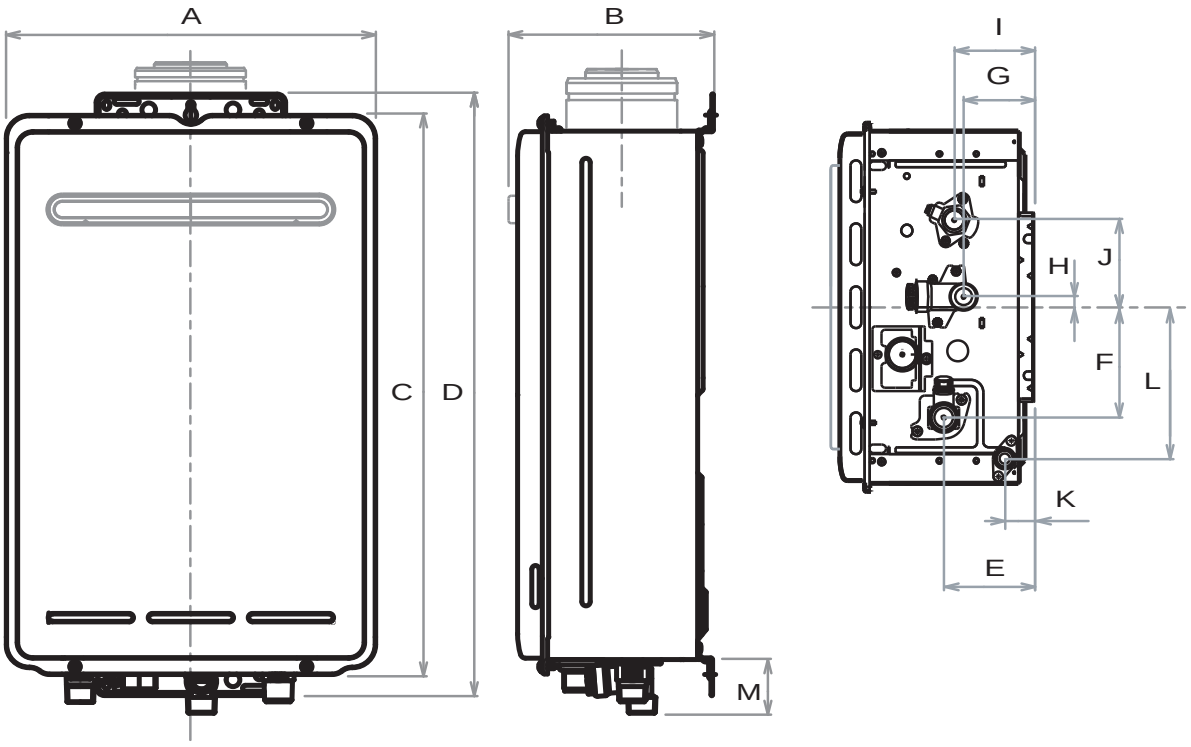
These dimensions are NOT an indication of the pipe sizes required.

An approved full flow isolation valve and disconnection union MUST be fitted to the cold water inlet. A non-return valve is not required unless required by local regulations.

Isolation valves must be fitted so the appliance can be removed.

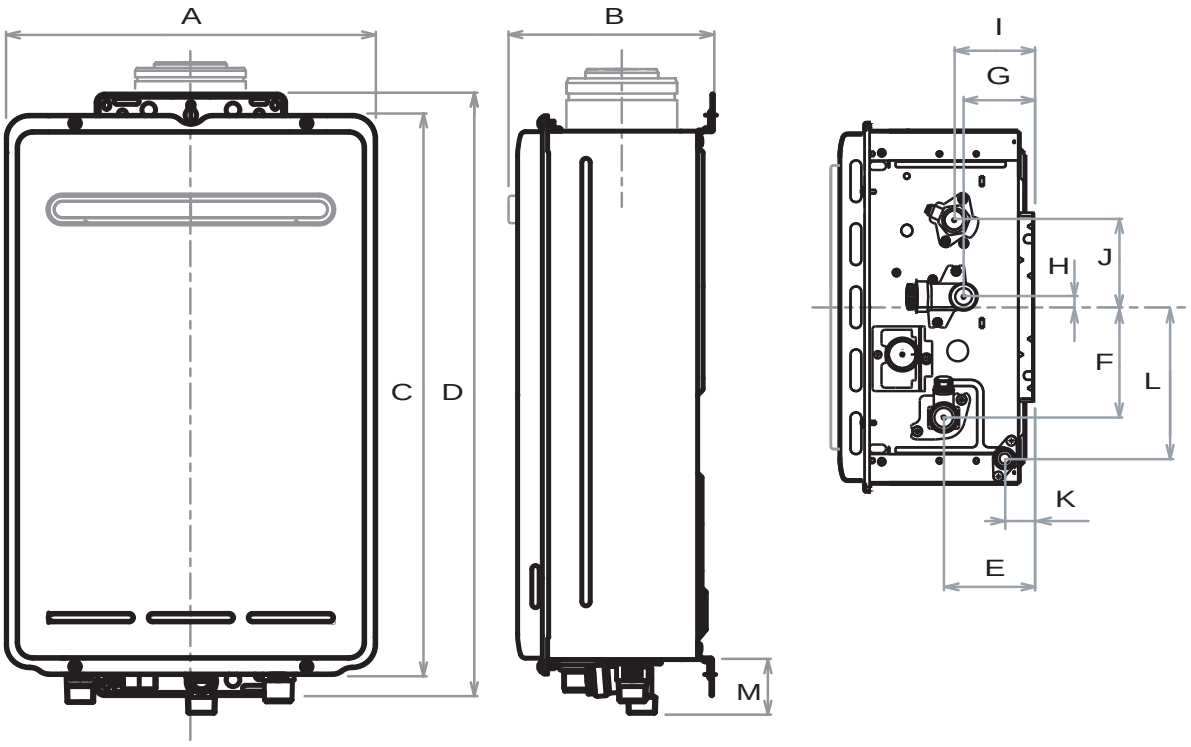
Purge gas and cold water supply lines to remove air and swarf before final connection of the appliance. Swarf in the gas or water supplies may cause damage.

Dimensions - VT and HD range



Dimension (mm)		VT16 Ext (REU-VR1620WG)	VT20 Ext (REU-VR2020WG)	VT24 Ext (REU-VR2426WG)	VT26 Ext (REU-VR2626WG)	VTa26 Ext (REU-VR2626WGT)	HD200 Ext (REU-VRM2632WC)	HDi200 Int (REU-VR2632FFUG)	HD250 Ext (REU-VR3237WG)
A	Width	350	350	350	350	350	350	350	470
B	Depth	194	194	194	194	194	250	235~275	244
C	Height - Unit	530	530	530	530	530	600	600	600
D	Height - Including Brackets	571	571	571	571	571	636	641	644
E	Hot Water Outlet (from wall)	87	87	87	87	87	95	91~131	115
F	Hot Water Outlet (from centre)	105	105	105	105	105	110	110	61
G	Cold Water Inlet (from wall)	68	68	68	68	68	74	70~110	99
H	Cold Water Inlet (from centre)	10	10	10	10	10	27*	27*	52
I	Gas Connection (from wall)	77	77	77	77	77	103	99~139	61
J	Gas Connection (from centre)	83	83	83	83	83	89	89	110
K	Condensate Outlet (from wall)	•	•	•	•	•	•	•	•
L	Condensate Outlet (from centre)	•	•	•	•	•	•	•	•
M	Gas: Length Gas Connection (from base)	40	40	40	40	40	41	41	41
	Cold: Length of Cold Water Inlet (from base)	50	50	50	50	50	51	51	51
	Hot: Length of Hot Water Outlet (from base)	39	39	39	39	39	42	42	42
* this measurement is to the left of the centre line									
HDi200, height of flue spigot from base of unit ≈ 85 mm									

Dimensions - EF range



Dimension (mm)		EF24 Ext (REU-K2430WG)	EF250 Ext (REU-KM3237WD	EFi250 Int (REU-KM3237FFUD)
A	Width	350	470	470
B	Depth	277	283.1	257~307
C	Height - Unit	600	654	654
D	Height - Including Brackets	644	721.6	721.6
E	Hot Water Outlet (from wall)	164.5	100	100~150
F	Hot Water Outlet (from centre)	100	100	100
G	Cold Water Inlet (from wall)	83	64.6	64.6~114.6
H	Cold Water Inlet (from centre)	53*	27.2	27.7
I	Gas Connection (from wall)	70.5	89	89~139
J	Gas Connection (from centre)	25	103.2	103.2
K	Condensate Outlet (from wall)	33	122.6	122.6
L	Condensate Outlet (from centre)	132	195	195
M	Gas: Length Gas Connection (from base)	51	40.2	40.2
	Cold: Length of Cold Water Inlet (from base)	62	50.2	50.2
	Hot: Length of Hot Water Outlet (from base)	41	41.2	41.2
	Condensate Connection Length (from base)	24	22.4	22.4

* this measurement is to the left of the centre line

EF250 models: Earthing the unit

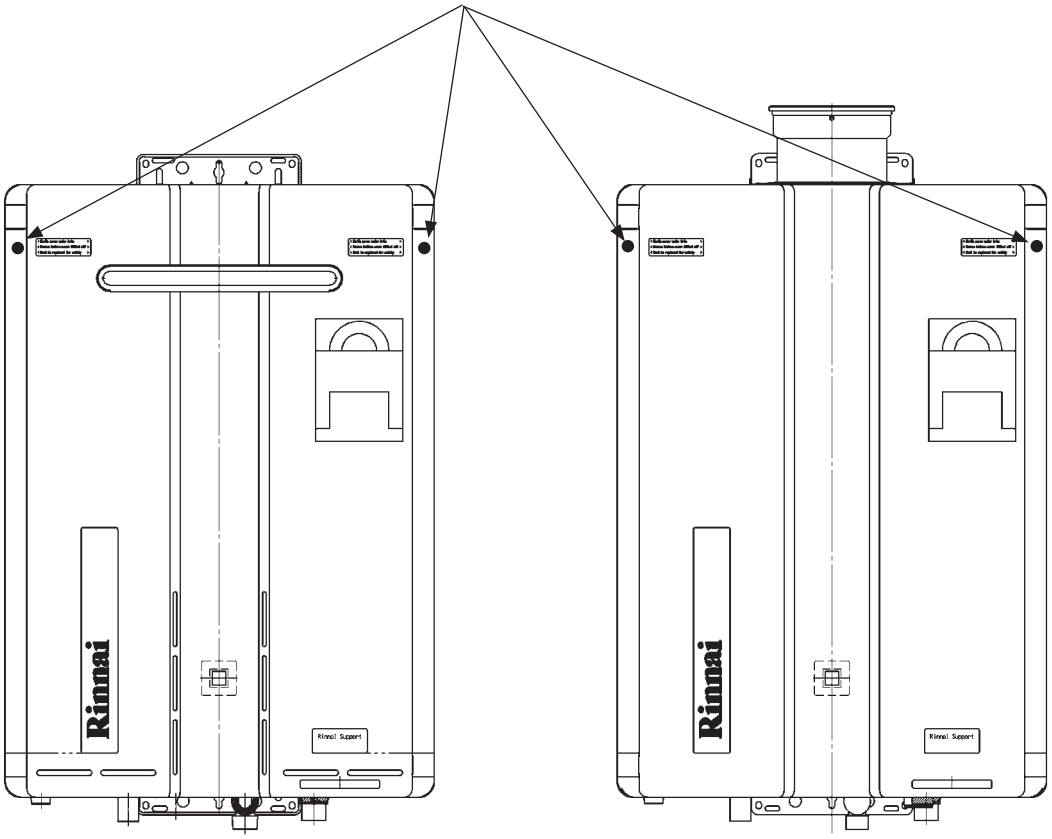
Removing the cover and earthing the unit

For the Rinnai condensing continuous flow water heaters (EF250 & EFi250), the earthing screws are located under the side trim, refer image below. First remove the trim and then the earthing screws before lifting off the cover.

WARNING

For safe operation of the appliance the earthing screws MUST be replaced.

Earthing screws located under side trim



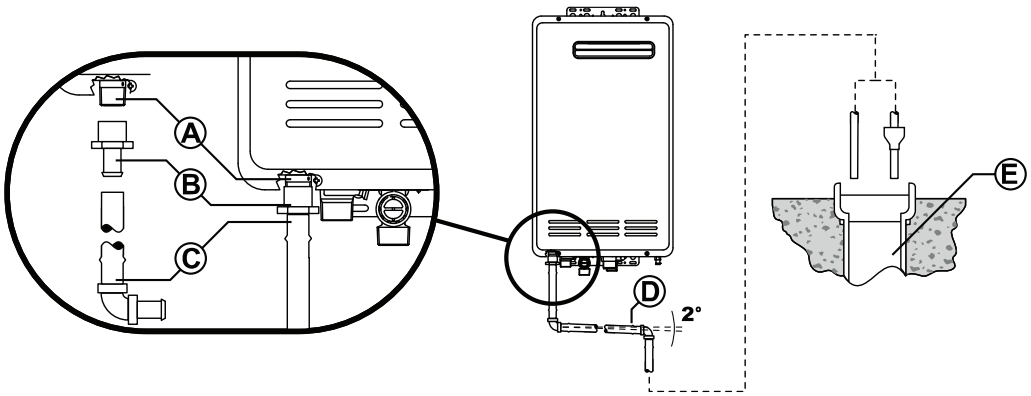
Condensate drain - EF models only

The Rinnai Infinity EF water heaters generate condensate continuously at a rate of up to five litres per hour as a by-product of a highly efficient gas burner. Condensate must be drained via a pipe to a suitable discharge point.

As condensate is a by-product of gas combustion it is mildly acidic. For this reason copper tube and fittings MUST NOT be used as it will corrode. Instead Rinnai recommend plastic pipes and fittings.

Important considerations for condensate drain pipe

Content of AS3500.4.2003 section 5.12 'Temperature/Pressure Relief and Expansion Control Valve Drain Lines' has been used as a guide in preparing these considerations.



A) Water heater drain outlet connection, ½ ″ (15 mm) BSP male.

B) PE ½ ″ BSP (15 mm) female to barbed ignition system connector (13-19 mm) or equivalent plastic fitting.

C) Drain pipe and fittings to match (B).

D) Continuous fall of at least 2° from water heater to discharge point, length and bends in accordance with those stated below.

E) Suitable points of discharge are deemed to be sewers or pits. DO NOT discharge onto electrical connections, earth stakes, copper pipes, concrete paths or into a pond.

Maximum length and changes of direction greater than 45°

Length and Changes of Direction				
Maximum length (m)	9	8	7	6
Maximum changes of direction (> 45°)	3	4	5	6

Condensate drain - EF models only

Installation of a condensate drain

Point of discharge from each drain line shall be located so the release of condensate does not cause a nuisance, is readily discernible and incurs no risk of building damage. There shall be no tap, valve or other restrictions in any line. Each line shall fall continuously from the valve to the approved point of discharge.

Drain lines shall not discharge into a storage water heater safe tray. The end of the condensate drain line shall be:

- Not lower than 200 mm or higher than 300 mm above an unpaved surface; or
- Not lower than 75 mm or higher than 300 mm above a gravel pit and not less than 100 mm in diameter in a paved surface.

Where discharging over a tundish or gully trap, drain lines shall have an air gap of a size at least twice the diameter of a drain line.

Joining of condensate drain lines

Condensate drain lines from multiple water heaters may be joined together provided they conform with the installation requirements above.

Common stack discharge

Where individual heaters are installed in a multistorey building, the condensate drain lines may discharge into a common stack subject to the following:

- Drained to a tundish having a discharge line that is not less than the common stack, directly connected to a fixture trap, and installed in a connection with any adjacent soil or waste stack
- Discharge point of the common stack is readily visible and does not cause any nuisance
- Common stack is vented by extending the pipe upwards, above the roof level

Tundish drain lines

The drain line from any tundish shall be not less than DN 20 or less than one size larger than that of the largest drain line discharging into the tundish. Tundish drain lines shall comply with the installation requirements above.

Areas subject to freezing

In areas where water pipes are prone to freezing, the drain pipe from any valve shall be insulated and not exceed 300 mm in length. It shall discharge into a tundish through an air gap of not less than 75 mm and not exceed more than 150 mm measured from the outlet of the drain pipe to the rim of the tundish.

Controllers - general

Water controllers are available as an optional extra. Universal (Compact), Deluxe and Wireless Controllers can be used together. A maximum of four water controllers can be fitted with the following limitations:

- Maximum of one Kitchen Deluxe Controller (MC-100V)
- Maximum of two Bathroom Deluxe Controllers (BC-100V)
- Only one controller can be set to deliver 55 °C, this cannot be a Bathroom Deluxe Controller

This section refers to wired controllers. For details on Wireless Controllers, refer to separate instructions.

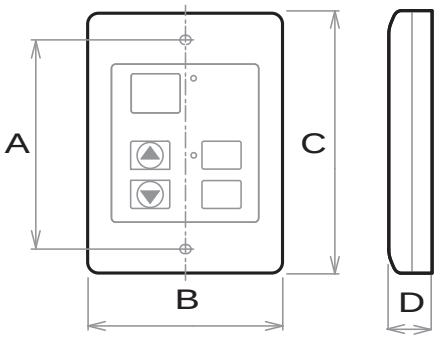
IMPORTANT

Other manufacturers' controllers are not compatible with this appliance.

Do not install controllers:

- near a heat source such as, a cook top, stove or oven (heat, steam, smoke or hot oil may cause damage)
- in direct sunlight
- outdoors unless protection from dust ingress and sunlight are provided
- against a metal wall unless in accordance with AS3000.

Dimensions (mm)



Dim'	Description	Universal (MC-91)	Kitchen Deluxe (MC-100V)	Bathroom Deluxe (BC-100V)
A	Distance between mounting holes	83	83	181
B	Width	90	128	195
C	Height	120	120	97
D	Depth	20	20	22

Controllers - general

Positioning

Controllers must be installed in shaded and clean locations. They should be fitted out of reach of children (suggested height 1.5 m). The Compact and Bathroom Deluxe Controllers are water resistant, however, durability is improved when positioned outside the shower recess or at least 400 mm above the highest part of a sink, basin or bath.

Water controller cables

Water controllers operate at extra low voltage (12 Volts DC) which is supplied from the water heater. Controllers come with 15 m of electrical cable. The appliance end of the controller cables are fitted with spade terminals.

Extension cabling is available as an accessory from Rinnai. Alternatively, a two core sheathed (double insulated) flex with a minimum cross sectional area of 0.5 mm^2 may be used. Maximum individual cable runs:

One controller	= 100 m
Two controllers	= 50 m (per controller)
Three or more controllers	= 20 m (per controller)

Water controller cables are not polarity sensitive.

Controllers - Universal installation

Fitting the Universal (Compact) Controller

1. Determine the most suitable position for the controller.
2. Drill three holes as shown (Fig.1 and Fig.2) for the securing screws and one to provide cable access.
3. When running cable through the access hole ensure the connector end of the cable is located nearest to the controller (Fig.2).
4. Carefully remove the face plate from the controller using a screwdriver (Fig.3).
5. Fix the controller to the wall using appropriate fittings as shown (Fig.4).
6. Remove protective plastic from the controller face as shown (Fig.4) and replace the face plate.

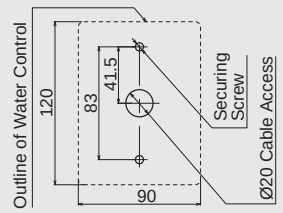


Fig.1

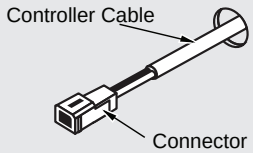


Fig.2

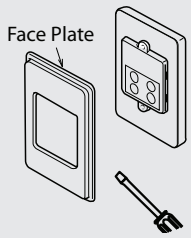


Fig.3

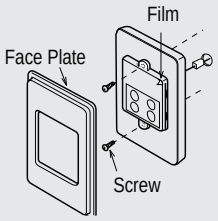
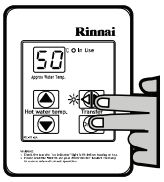


Fig.4

Optional programming of the Universal controller

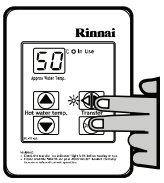
Step 1



Are four controllers connected? **No**, refer step 2. **Yes**, you will need to activate the fourth controller as follows:

1. For the controller in the kitchen only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously until a beep is heard (approximately five seconds).
2. Check display on all four controllers is displaying a temperature when switched on. If any controller displays two dashes, repeat above step.

Step 2

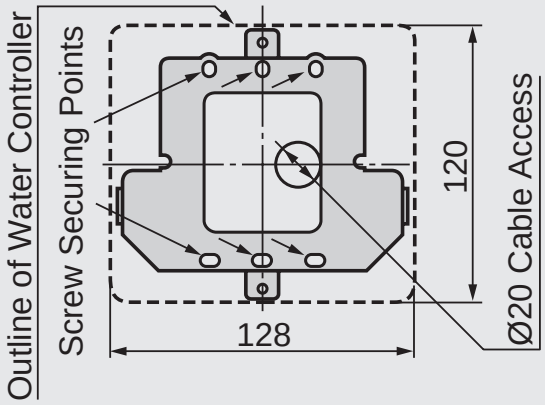


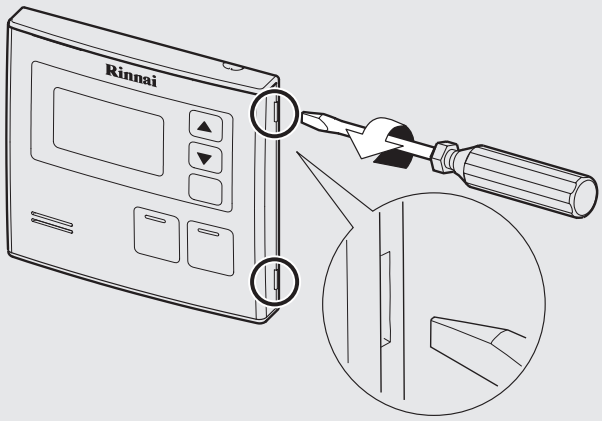
1. For the controller in the kitchen only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously until a beep is heard (approximately five seconds).
2. When the controller fitted in the kitchen is switched on it will be possible to select temperatures higher than 50 °C (at this controller). If not repeat above step.

If the kitchen controller is replaced or swapped repeat the programming procedure.

Controllers - Kitchen Deluxe installation

1. Determine the most suitable position for the controller.
2. Use the wall mounting bracket as a template to mark and drill three holes, locating the cable access hole as shown below.
3. Fix the mounting bracket to the wall using the appropriate fixings.
4. Run the water controller cable through the hole in the wall.
5. Carefully remove face plate from the controller, using a screwdriver as shown below.
6. Connect the controller cable to the kitchen water controller. At this point cables from other controllers (if fitted) may also be connected to the kitchen water terminals, eliminating the need for multiple cable runs directly to the water heater. Feed excess cable lengths into the wall cavity to avoid pinching of cables between the wall and the water controllers.
7. Fasten water controllers to wall mounting bracket. Avoid the use of impact drills and over-tightening of fixings as this may damage the controllers.
8. Remove the protective plastic from the controller face and replace the face plate.





Controllers - Bathroom Deluxe installation

1. Determine the most suitable position for the controller.
2. Mark and drill three holes, locating the cable access hole as shown (Fig.1).
3. When running a cable through the access hole ensure the connector end of the cable is located nearest to the controller (Fig.2).
4. Affix the double sided self-adhesive seal to the back of the controller (Fig.3).
5. Carefully remove the face plate from the controller. Do this by placing your thumbs on the front digital display while hooking your fingers behind the top plate and gently push down as shown (Fig.4). Do not use a screwdriver as this may damage the controller.
6. Connect the cable to the bathroom controller. Feed excess cable lengths into the wall cavity to avoid pinching of cables between the wall and the controller.
7. Fix bathroom controller to the wall using appropriate fixings. Avoid the use of impact drills and over-tightening of fixings as this may damage the controller.
8. Remove the protective plastic from the controller face and replace the face plate.

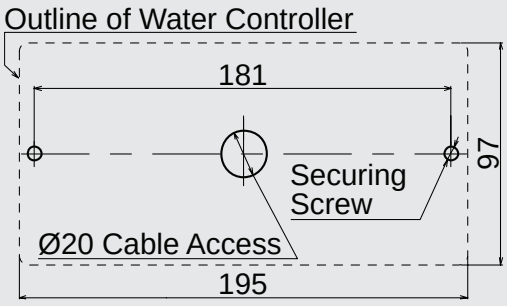


Fig.1

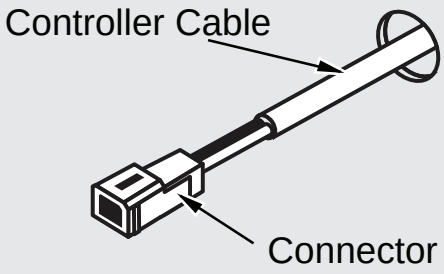


Fig.2

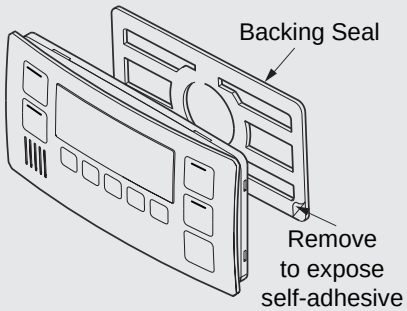


Fig.3

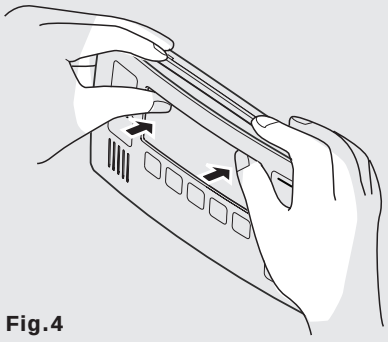


Fig.4

Controllers - communication cables

Communication cables connect the water heater to the water controllers and operate at an extra low voltage (12 Volts DC) which is supplied from the water heater. Communication cables are supplied with the water controllers (15 m) and are fitted with spade terminals for connection to the water heater. Up to two cables can be connected to the cable connector at the water heater.

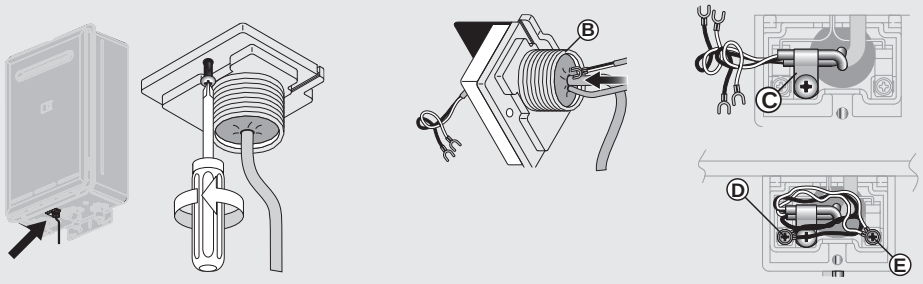
Extension cables are available from Rinnai. Alternatively two core sheathed (double insulated) flex with a minimum cross sectional area of 0.5 mm^2 may be used (refer maximum individual cable lengths on p. 15).

CAUTION Do not attempt to connect cables to the cable connector at the water heater unless the electric power supply to the water heater is switched off otherwise damage to electrical components may occur.

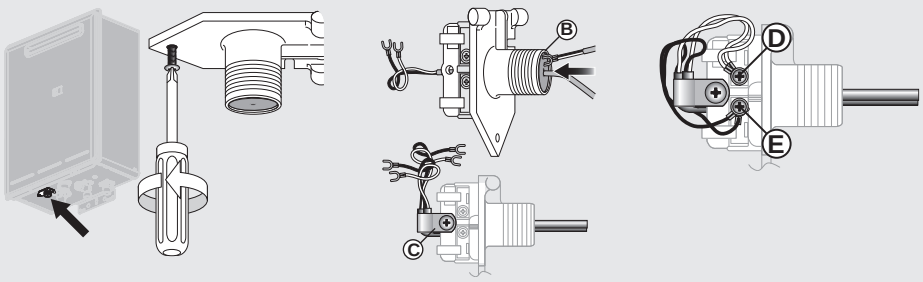
To connect up to two cables to the cable connector

1. Turn off power supply and unplug water heater from the power point.
2. Remove retaining screw of the cable connector at the base of the appliance.
3. Swing the cable connector door open. Thread the cable through the weather seal of the cable access hole (B) in the direction shown allowing sufficient cable length so the cable sheath can be secured with the cable clamp (C) supplied with the transceiver.
4. Loosen screw terminals (D) and (E) and connect cable spade connectors to these terminals and re-tighten. Polarity is not important, either wire colour can be connected to either terminal.
5. Return the cable connector to the original position taking care not to damage cable wires in the process and replace the retaining screw.

Cable connector for VT26, VTa26, VT24, VT20, and VT16



Cable connector for HD250, HD200, HDi200, and EF models



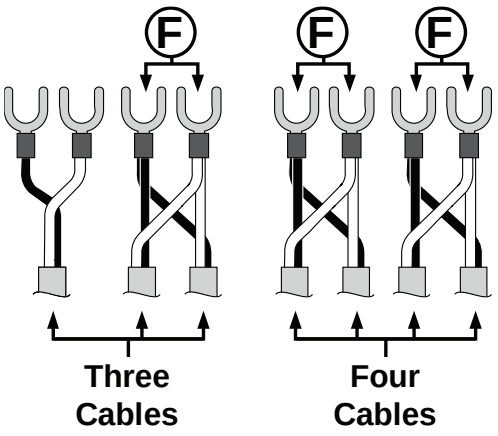
Controllers - communication cables

Connecting three to four controllers

1. Repeat steps 1-3 on previous page.

2. To connect three to four controllers, separate all the cables to be fitted into pairs. Cut off the existing spade connectors from each pair and re-terminate each pair into a new spade connector (F) (available from your local electrical supplier) so there are only two sets of spade connectors. Four spade connectors in total to be terminated.

3. Repeat steps 4 and 5 on previous page.



Spade connectors are available from your local electrical supplier.

Commissioning

Testing

WARNING Ensure building occupants do not have access to the hot water outlets during this procedure.

1. Before final connection of the water heater, purge the gas and hot and cold water supply lines. Swarf in the gas or water supplies may cause damage.
2. Turn on the gas and water supplies and test for leaks (gas and water) near the unit.
3. Isolate gas supply. Remove test point screw located on the gas inlet and attach pressure gauge.
4. Turn the power on at the power point socket and turn on the gas.
5. If water controllers are fitted ensure they are on. Select the maximum delivery temperature and open all available hot water taps including the shower. If water controllers are not fitted, open all available hot water taps.
6. Operate all other gas appliances at their maximum gas rate.
7. With all gas appliances operating on maximum, the pressure should read between 1.0-3.5 kPa (NG) or 2.75-3.5 kPa (LPG). If the pressure is lower, the gas supply is inadequate and the appliance will not operate to specification. It is the responsibility of the installer to check the gas meter, service regulator and pipe work for correct operation and sizing. The gas regulator on the appliance is electronically controlled and factory preset. Under normal circumstances it does not need adjustment during installation.
8. Close all hot water outlets.
9. Inspect and clean the strainer located on the cold water inlet connection. This may need to be repeated to ensure the strainer remains clear, especially on new installations.
10. If water controllers are fitted, it is necessary to test their operation through the complete range of functions (refer operation manual).
11. Confirm hot water delivery temperatures using a thermometer. If controllers are fitted, ensure temperatures exceeding 55 °C cannot be selected on bathroom controllers.
12. After testing is completed, explain to the customer how to operate the water heater and water controllers (if fitted). Ensure your details are completed (p. 26 of the operation manual).

Gas pressure setting

The gas regulator on the appliance is electronically controlled and factory preset. Under normal circumstances it does not need adjustment during installation. Make adjustments only if the unit is not operating correctly and all other causes for incorrect operation have been eliminated. Instructions for gas pressure setting are in the instruction pocket located inside the appliance front cover.

Commissioning checklist

Commission the unit in accordance with the Commissioning Checklist supplied with the appliance (front cover of appliance). Ensure you leave the completed checklist with the customer.

Recommended solar system layout

Warning about hot water

Rinnai continuous flow water heaters configured for solar systems produce hot water at 75 °C and are not suitable for use with water controllers. The household water supply MUST be protected by a suitable tempering valve.

Installation

Rinnai continuous flow water heaters in solar installations are only suitable as gas boosters in solar hot water systems. These models produce water at higher than normal temperatures and must be connected to the hot water supply by use of a suitable tempering valve.

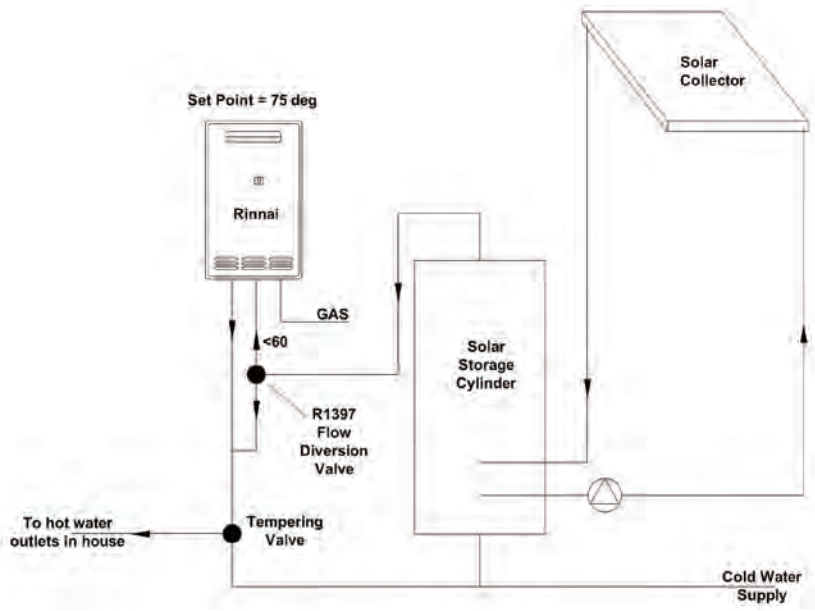
Install a Rinnai continuous flow water heater using a flow diversion valve as shown below. Remember 'B to Boiler' when setting up the flow diversion valve.

The water heater must be set to 75 °C (refer dip switch settings on following pages).

Rinnai water controllers cannot be used with Rinnai Infinity solar units as the:

- Hot water does not always pass through the Rinnai Infinity
- Rinnai Infinity dip switch setting of 75 °C is unable to be adjusted

Recommended system layout using a Rinnai Continuous Flow water Heater and Flow Diversion Valve



System configuration to protect for Legionella

If the system is configured according to the details above it will meet the requirements of the Acceptable Solution G12/AS2 for protection against Legionella. Section 3.5.2 states:

> b) *the instantaneous water heater must heat all water passing through it to not less than 70 °C.*

Dip switch settings - important

Dip switch settings must only be changed by a licensed gasfitter. They have been provided as there may be a requirement to change the temperature of the water delivered from the water heater.

WARNING

Care must be taken when changing the temperature settings as the dip switches are small and can be easily switched or bumped into the wrong position. Please use this information carefully and fully check the operation of the water heater before leaving site including the temperature of the water delivered.

The cover of the water heater will need to be removed to carry out this operation. As this will expose live mains voltage wiring **please disconnect the power supply before removing the front cover**.

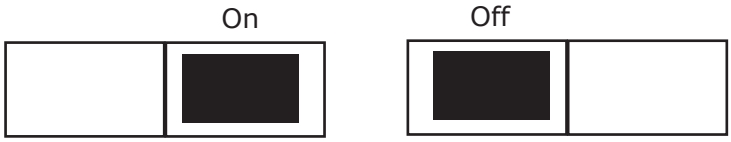
We wish to draw your attention to the requirements of the New Zealand Building Code and compliance document G12. This requires that water delivered to sanitary fixtures be no more than 55 °C. Increasing the water heater set temperature will therefore require that you protect all sanitary fixtures to which the appliance is plumbed with suitable tempering valves or similar.

Rinnai will accept no liability for issues arising out of the use of this dip switch information. If you have any doubts about the performance of the water heater please contact Rinnai by phoning 0800 TO RINNAI (0800 86 746 624).

The setting of water temperatures in domestic model Infinity units (white cases) to greater than 55 °C (with the exception of units set to 75 °C in domestic solar installations) will reduce the warranty period. Refer to warranty information in the Operation Manual for further information.

The following pages detail dip switch settings for the specific Rinnai continuous flow water heaters listed. They ARE NOT applicable for older models.

Legend for Dip Switch Settings (black section indicates position of switch)



Short and long flues

Reference to what is a short and long flue can be found on page 6.

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity VT16	External	REU-VR1620WG
Rinnai Infinity VT20	External	REU-VR2024WG
Rinnai Infinity VT24	External	REU-VR2426WG
Rinnai Infinity VT26	External	REU-VR2626WG
Rinnai Infinity VTa26	External	REU-VR2626WGT
Rinnai Infinity EF24	External	REU-K2430WG

Dip Switch 1: Upper SW(8P)

SW No.	Note							
1		Off						
2	Fixed temperature (with controllers)	Off	Fixed temperature			On	With controllers	
3 4 5	Temperature settings	See Chart A						
6		Off						
7	Gas pressure	Off	Normal	On	Forced min.	On	Forced max.	
8		Off		Off		On		

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	4	5	No controllers (fixed temp.)	No controllers (fixed temp.)	With controllers (max. set temp.)
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	On	not to be used	40	40
On	On	On	not to be used	55	75

Dip Switch 2: Lower SW(4P)

SW No.	Note				
1	Gas type	Off	LPG	On	NG
2,3,4	Model settings	See Chart B			

Chart B: Model Settings

Dip.SW.2-SW No.(4P)			Model (REU-number)
2	3	4	
Off	Off	Off	VT26 (VR2626WG), VTa26 (VR2626WGT) and EF24 (K2430WG)
Off	On	Off	VT24 (VR2426WG)
Off	Off	On	VT20 (VR2024WG)
Off	On	On	VT16 (VR1620WG)

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity HD200	External	REU-VRM2632WC
Rinnai Infinity HDi200	Internal	REU-VR2632FFUG
Rinnai Infinity HD250	External	REU-VR3237WG

Dip Switch 1: Upper SW(8P)

SW No.	Note							
1	FF model	Flue setting	Off	Long flue (p. 6)		On	Short flue (p. 6)	
	W model	Model setting	Off					
2	Fixed temperature (with controllers)		Off	Fixed temperature		On	With controllers	
3 4 5	Temperature settings		See Chart A					
6			Off					
7	Gas pressure		Off	Normal	On	Forced min.	On	Forced max.
8			Off		Off		On	

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	**4**	**5**	**No controllers (fixed temp.)**	**No controllers (fixed temp.)**	**With controllers (max. set temp.)**
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	On	85, 95[1]	40	40
On	On	On	85	55	75

[1] 95 °C setting only available for HD250 model

Dip Switch 2: Lower SW(4P)

SW No.	Note				
1	Gas type	Off	LPG	On	NG
2,3,4	Model settings	See Chart B			
5,6	Not in use	Off			

Chart B: Model Settings

Dip.SW.2-SW No.(4P)			Model (REU-number)
2	**3**	**4**	
Off	Off	Off	HD250 (VR3237WG)
Off	Off	On	HD200 (VRM2632WC)
Off	On	On	HDi200 (VR2632FFUG)

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity EF250	External	REU-KM3237WD
Rinnai Infinity EFi250	Internal	REU-KM3237FFUD

Dip Switch 1: Upper SW(8P)

SW No.	Note							
1	Flue settings	Off	EF250 Ext & EFi250 Int long flue (p. 6)			On	EFi250 Internal short flue (p. 6)	
2	Fixed temperature (with controllers)	Off	Fixed temperature			On	With controllers	
3 4 5	Temperature settings	See Chart A						
6	Not in use	Factory setting is 'Off'						
7	Gas pressure	Off	Normal	On	Forced min.	On	Forced max.	
8		Off		Off		On		

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	4	5	No controllers (fixed temp.)	No controllers (fixed temp.)	With controllers (max. set temp.)
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	Off	95	40	40
On	On	On	85	55	75

Dip Switch 2: Lower SW(6P)

SW No.	Note				
1	Gas type settings	Off	LPG	On	NG
2		Off		Off	
3	Type settings	Off	External	Off	Internal
4		Off		On	
5	Automatic return	Off	Inactive	On	Active
6	External device	Off	S-BMS	On	AH

Rinnai

EXPERIENCE OUR INNOVATION

Consumers: 0800 RINNAI (746 624)
Installers: 0800 TO RINNAI (86 746 624)

Address: 105 Pavilion Drive, Airport Oaks, Mangere, Manukau
PO Box 53177, Auckland Airport, Manukau 2150

Phone: (09) 257 3800
Fax: (09) 257 3899

Email: info@rinnai.co.nz
Website: www.rinnai.co.nz

All Rinnai appliances meet or exceed the safety standards required by New Zealand gas and electrical regulations.

Rinnai is constantly improving its products and as such information and specifications are subject to change or variation without notice.

Installation Manual

070 00012 33049 5

U298-1272(00)

Rinnai
EXPERIENCE OUR INNOVATION

Suitable for:

- external domestic applications
- high simultaneous hot water demand applications (homes with 1-2 bathrooms)
- mains and low pressure systems

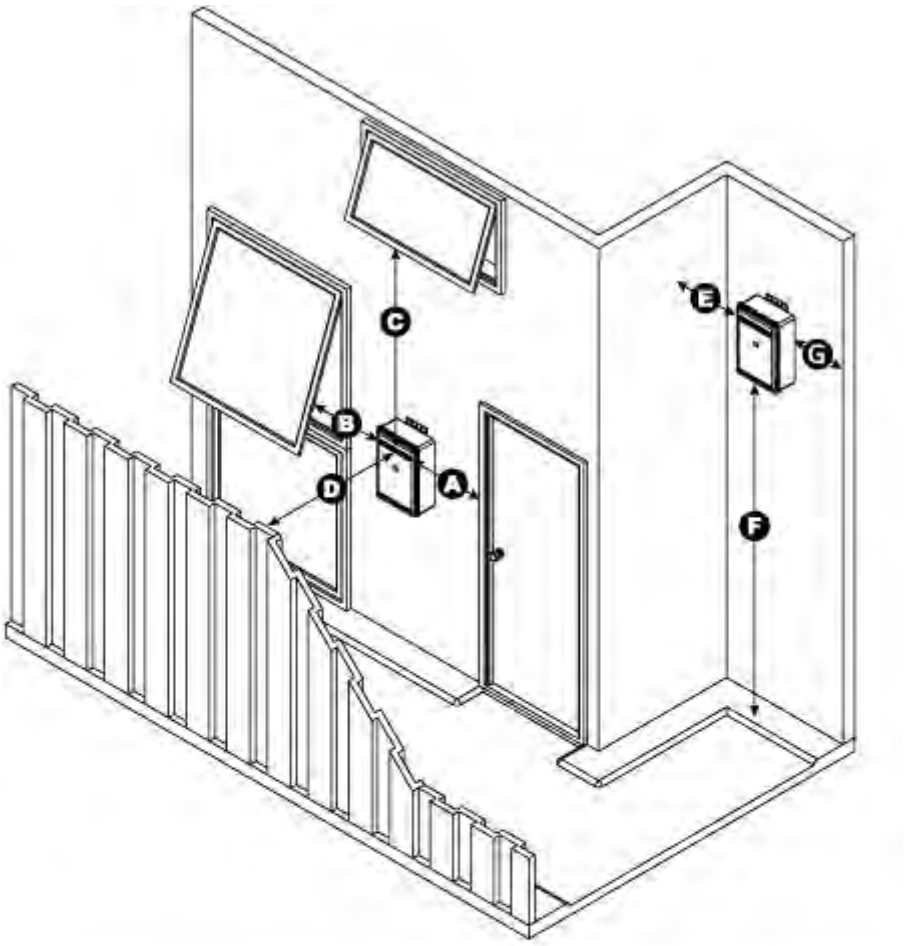
Hard or acidic water will need to be treated to use this product.

Gas type

Available for Natural Gas or LPG. Specify gas type at time of purchase.

General clearances

The following diagram has been provided to assist you in determining where (and if) an external continuous flow water heater can be positioned. If in doubt, prior to purchase, consult a licensed gasfitter.



Dimension	Infinity VT models Infinity HD200 models Infinity EF models	Infinity HD250 models
A	Min. 300 mm	Min. 500 mm
B	Min. 300 mm	Min. 500 mm
C	Min. 1.5 m	Min. 1.5 m
D	Min. 500 mm	Min. 500 mm
E	Min. 300 mm	Min. 300 mm
F	Min. 300 mm*	Min. 300 mm*
G	Min. 300 mm	Min. 300 mm

Clearance below eaves, balconies, and other projections, for all models, is 300 mm.

*Rinnai recommend 1.5 m to give enough clearance for the pipe work, and to safely expel flue gases.

BUILDING WRAPS

Product Data Sheet

WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

Smarter products. Better buildings.
thermakraft.co.nz

CodeMark BRANZ-CM-1002

BRANZ Appraised
Appraisal No.695 [2017]

Watergate Plus

Premium Synthetic Wall wrap

Watergate Plus comes in five roll sizes and two soffit roll sizes:

Width	Length	Coverage
1370mm wide	18.5m long	25m² coverage*
1370mm wide	37.0m long	50m² coverage*
1370mm wide	73.0m long	100m² coverage*
2740mm wide	18.5m long	50m² coverage*
2740mm wide	36.5m long	100m² coverage*

Soffit Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP600025SOF	685mm	36.5m	25m² coverage*
WGP600050SOF	685mm	73m	50m² coverage*

Custom Branding Available – Contact your Thermakraft Representative for more details

* **Note:** M² is the roll size for actual coverage, allow for laps and joins.

Product Description

Watergate Plus is a two-layer laminated wall underlay combining a Polyester non-woven layer with a high quality vapour permeable film. This allows water vapour to pass through from inside the wall cavity whilst water from the exterior is kept out.

The product is simply fixed to timber framing using construction staples and is made to stretch around corners providing a tight fit and reducing the risk of staple tear. It will provide temporary weather protection during construction. (Max 60 Days).

Scope of Use

Watergate Plus can be used as a wall underlay on both residential and commercial buildings within the following scope:

- With absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with timber and steel framing, either directly fixed or in conjunction with an 18mm minimum drained cavity.
- With masonry veneer in accordance with NZS 3604, NZBC Acceptable Solution E2/AS1.
- Situated in NZS3604 Building Wind Zones up to (and including) 'Very High' when used as a standalone flexible underlay, and "Extra High" when used as a flexible underlay over a rigid wall underlay.
- Is suitable as an air barrier in unlined wall spaces.
- Is suitable to be used in conjunction with thermal breaks on steel framed buildings.
- Refer to BRANZ Appraisal No 695 (2017) and CodeMark Certificate for full details.

General

- Fire retardant.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.

Limitations

- Must NOT be used as a roof underlay.
- Must NOT be exposed to the weather or UV for more than 60 days.
- Watergate Plus is NOT a vapour barrier.

Compliance

- Watergate Plus has been appraised with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area.
- Watergate Plus has also been BRANZ appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate-Plus into their design in accordance with the declared properties and the instructions of Thermakraft Limited.
- Refer to BRANZ Appraisal No 695 (2017) and CodeMark Certificate for full details.

Watergate Plus

Premium Synthetic Wall wrap

Flammability Index

Thermakraft Watergate Plus Wall Underlay has an AS 1530 Part 2 Flammability Index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Durability

Meets the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), E2 External Moisture (E2.3.2), and F2 Hazardous Building Materials F2.3.1, providing:

- It is not damaged.
- Installed in accordance with instruction guide.
- Is not left exposed for more than 60 days.
- Installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used.*

* **Note:** specifiers and product user must test for wall cladding system compatibility with the underlay before installation.

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Property Performance

NZBC E2/AS1 Table 23 (NZS2295) Wall Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 100gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	≥ 20mm	≥ 0.1 MN.s/m3
Property Performance	Pass	Pass	Pass	Pass	Pass	Can be used as an air barrier

Thermakraft Limited / 0800 806 595

Smarter products. Better buildings.

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CODEMARK BRANZ-CM-1002

BRANZ Appraised Appraisal No.695 [2017]

Issue 7, November 2019

Thermakraft

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Installation Guide

WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

Smarter products. Better buildings.
thermakraft.co.nz

CodeMark BRANZ-CM-1002

BRANZ Appraised
Appraisal No.695 [2017]

Installation Guide

Application Method

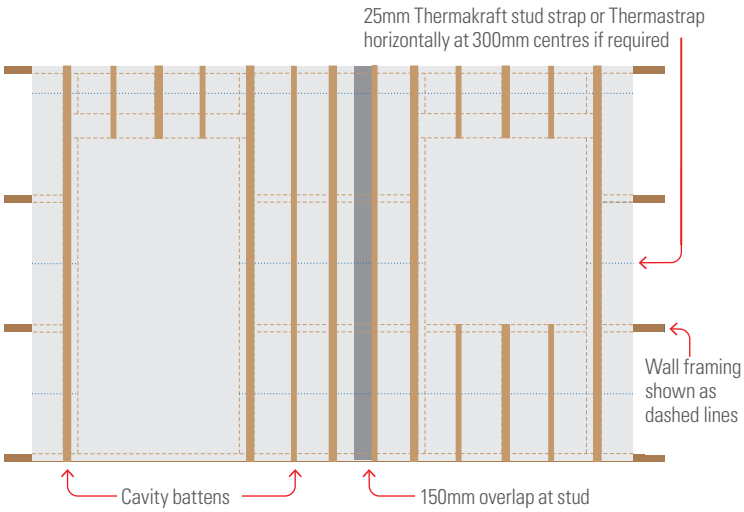
- Fix Watergate Plus underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Watergate Plus underlays are available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to come from below the bottom plate to the top plate.
- When fixing Watergate Plus underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Watergate Plus underlay.
- It is recommended that the Watergate Plus underlay is not cut and prepared for window installation until the arrival of the windows. minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft stud strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 60 days. Watergate Plus underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Watergate Plus underlay must be installed by a licensed building practitioner.

Fix securely to the frame with fasteners such as 6-8mm staples

On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.



Handling and Storage

Thermakraft Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Thermakraft Limited / 0800 806 595

Issue 1, November 2019

PRODUCT CERTIFICATE

THIS IS TO CERTIFY

THERMAKRAFT WATERGATE PLUS 295 WALL UNDERLAY

CODEMARK

cate No: BRANZ-CM-1002
f Issue: 11 January 2019
on Date: 11 January 2022

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DESCRIPTION OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is a white coloured flexible synthetic wall underlay.

USE OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is for use as a flexible wall underlay for timber and steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with direct fixed wall claddings, or with wall claddings installed over a drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- situated in NZS 3604: 2011 Wind Zones up to and including Very High when fixed directly to framing, and Extra High when fixed over a rigid air barrier.

Thermakraft Watergate Plus 295 Wall Underlay is also for use:

- as an air barrier in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c); or,
- as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1, or as a slip layer over a rigid backing for stucco cladding in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 (b).

COMPLIES WITH THE FOLLOWING PROVISIONS OF THE NEW ZEALAND BUILDING CODE (NZBC)

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years (for when the cladding durability requirement is not less than 50 years), B2.3.1 (b), 15 years (for when the cladding durability requirement is 15 years) and B2.3.2 (a).

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c).

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

SUBJECT TO THE FOLLOWING CONDITIONS AND LIMITATIONS

- Thermakraft Watergate Plus 295 Wall Underlay must not be exposed to the weather or ultra violet light for more than 60 days before being covered by the wall cladding.
- Framing studs must be at a maximum of 600 mm centres. Timber framing must be in accordance with NZS 3604: 2011 or to a specific design. Steel framing must be to a specific design.

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REFERENCE DOCUMENTS

This Product Certificate must be read in conjunction with:

- BRANZ Appraisal No. 695 (2017) Thermakraft Watergate Plus 295 Wall Underlay.
- Technical Literature: Thermakraft Watergate Plus 295, Issue 2, dated October 2018.
- Technical Literature: Thermakraft Wall Underlay Installation Procedures, Issue 2, dated November 2018.

APPENDIX A - PRODUCT TECHNICAL DATA

A1: TYPE AND INTENDED USE OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is for use as a flexible wall underlay fixed over timber or steel framed walls to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

Thermakraft Watergate Plus 295 Wall Underlay is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations. Thermakraft Watergate Plus 295 Wall Underlay is suitable for use under cavity-based wall claddings as an absorbent synthetic wall underlay as called up in NZS 2295: 2006, Table 2.4 on steel framed buildings.

A2: PRODUCT SPECIFICATION

Thermakraft Watergate Plus 295 Wall Underlay is a synthetic building underlay manufactured from film coated, non-woven, laminated flexible synthetic fabric. Thermakraft Watergate Plus 295 Wall Underlay is coloured white on the top and bottom faces and is printed with the Watergate Plus 295 logo repeated along the length of the roll.

The product is supplied in rolls 1.370 m wide x 18.5 m, 37.0 m and 73.0 m long; 2.740 m wide x 18.5 m and 36.5 m long and 3.0 m wide x 22.4m long. The rolls are wrapped in clear polythene film.

CODEMARK

cate No: BRANZ-CM-1002
f Issue: 11 January 2019
on Date: 11 January 2022

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A3: PRODUCT SPECIFICATION

TABLE 1: NZBC E2/AS1 TABLE 23 (NZS 2295:2006) REQUIREMENTS

NZBC E2/AS1 Table 23 (NZS 2295: 2006) Wall Underlay Properties	Property Performance Requirement	Actual Property Performance
Vapour Resistance	≤ 7 MN s/g	Pass
Absorbency	≥ 100 g/m2	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): Machine direction = 75 N 1 Cross direction = 56 N (Pass] Tensile strength (Average): Machine direction = 2.2 kN/m (Pass] Cross direction = 1.6 kN/m (Pass]
Air Barrier	Air resistance: ≥ 0.1 MN s/m3	Pass. Thermakraft Watergate Plus 295 Wall Underlay is suitable for use as an air barrier.

Note 1: Pass of BRANZ criteria for edge tear resistance.

A4 INSTALLATION REQUIREMENTS

Installation must be carried out in accordance with the following:

- Technical Literature: Thermakraft Watergate Plus, Issue 2, dated October 2018; and,
- Technical Literature: Thermakraft Wall Underlay Installation Procedures, Issue 2 dated November 2018; and,
- NZBC Acceptable Solution E2/AS1.

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APPENDIX B - OTHER RELEVANT TECHNICAL DATA

B1 STRUCTURE

Thermakraft Watergate Plus 295 Wall Underlay is suitable for use in all Wind Zones of NZS 3604: 2011 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604: 2011 up to, and including, Extra High when used as an overlay for rigid building underlays.

B2 DURABILITY

Thermakraft Watergate Plus 295 Wall Underlay meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building underlays used where the cladding durability requirement is 15 years. Thermakraft Watergate Plus 295 Wall Underlay is expected to have a serviceable life equal to that of the cladding.

B3 CONTROL OF INTERNAL FIRE AND SMOKE SPREAD

Thermakraft Watergate Plus 295 Wall Underlay has an AS 1530 - 1993 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b) for suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

B4 PREVENTION OF FIRE OCCURRING

Separation or protection must be provided to Thermakraft Watergate Plus 295 Wall Underlay from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

APPENDIX C - BASIS OF CODEMARK CERTIFICATION

The following tests have been carried out on Thermakraft Watergate Plus 295 Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23:

- tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1: 1994
- shrinkage in accordance with AS/NZS 4201.3:1994
- resistance to water penetration in accordance with AS/NZS 4201.4: 1994
- surface water absorbency in accordance with AS/NZS 4201.6: 1994
- pH of extract in accordance with AS/NZS 1301.421s: 1998
- air resistance to BS 6538.3:1987.

Ultra-violet (UV) light ageing of wall underlays is a critical evaluation requirement to verify a products continued performance after site construction exposure. UV aging of Thermakraft Watergate Plus 295 Wall Underlay equivalent to 60 days construction site exposure was completed and the range of tests detailed above were repeated after aging.

The Flammability Index of Thermakraft Watergate Plus 295 Wall Underlay has been evaluated in accordance with AS 1530.2 - 1993.

BRANZ Expert Judgement (Materials Scientist) confirmation of compliance to the NZBC Clause B2 Durability Performance Requirements.

The practicability of installation of Thermakraft Watergate Plus 295 Wall Underlay has been assessed by BRANZ and found to be satisfactory.

CODEMARK

Certificate No: BRANZ-CM-1002
Date of Issue: 11 January 2019
Expiry Date: 11 January 2022

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The referenced Technical Literature has been examined by BRANZ and found to be satisfactory.

The quality of supply to the market is the responsibility of Thermakraft Limited.

Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.

Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

SOURCES OF INFORMATION

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- ASTM D882:2012 Standard test method for tensile properties of thin plastic sheeting.
- ASTM E96/E96M:2016 Standard test methods for water vapor transmission of materials.
- ASTM G155:2013 Standard practice for operating xenon arc light apparatus for exposure of non-metallic underlays.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, permeable building underlays.
- NZS 3604: 2011 Timber-framed buildings.
- TAPPI T470:1986 Edge tearing resistance of paper (Edge-tear stirrup method)
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 8, 30 November 2018).
- Acceptable Solutions and Verification Methods for New Zealand Building Code Protection from Fire Clauses C1-C6, Ministry of Business, Innovation and Employment, First Edition April 2002 (Amendment 4, 1 January 2017)
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

BRANZ Appraised
Appraisal No. 695 [2017]

WATERGATE PLUS WALL UNDERLAY

Appraisal No. 695 (2017)

Amended 26 February 2020

This Appraisal replaces BRANZ Appraisal No. 695 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or to NASH Building Envelope Solutions for steel framed buildings; and,
- situated in NZS 3604 Wind Zones up to and including Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or NASH Building Envelope Solutions for steel framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to and including Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Thermakraft Limited.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Watergate Plus, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years, B2.3.1 (b), 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in rolls 1.370 m wide x 54.8 and 30 m long, 2.740 m wide x 30 and 18.5 m long and 3 m wide x 30 m long. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- Fixings - staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the wall underlay to the framing.
- Wall underlay restraint (timber frame) - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- Wall underlay restraint (steel frame) - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Watergate Plus. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 1 for material properties.

7.2 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.3 Watergate Plus must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber frame or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel frame. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel frame only).

Table 1: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m²	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m³	Pass. Watergate Plus can be used as an air barrier.

Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings and NASH Building Envelope Solutions Table 23 a steel framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 (b) for timber framing or NASH Building Envelope Solutions Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

9.1 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years for wall underlays used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 (b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber frames or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

14.6 Any damaged areas of Watergate Plus, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to ultra-violet light.

15.2 The flammability Index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- AS 1530.2: 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test - Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, permeable building underlays
- NZS 3604: 2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

BRANZ

Amendments

Amendment No 1, dated 30 November 2018

This Appraisal has been amended to change the Appraisal name to Watergate 295 Synthetic Underlay and to update Table 1.

Amendment No 2, dated 15 February 2019

This Appraisal has been amended to change the Appraisal name to Watergate Plus Wall Underlay

Amendment No 3, dated 26 February 2020

This Appraisal has been amended to change the Appraisal name to Watergate Plus, include roll size of 3.0 m x 30 m, update Table 1 and update NZBC referenced documents.

BRANZ

In the opinion of BRANZ, Watergate Plus Wall Underlay is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Thermakraft Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Thermakraft Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions.
   d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Thermakraft Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
21 September 2017

Product Data Sheet

ALUBAND

Bituminous adhesive flexible window flashing tape.

Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Aluband comes in four roll sizes:

Product Code	Roll Size	Rolls Per Carton
ALU075025	75mm x 25m	12
ALU150010	150mm x 10m	6
ALU150025	150mm x 25m	6
ALU200025	200mm x 25m	4

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BRANZ Appraised
Appraisal No.878 [2019]

Aluband

Bituminous adhesive flexible window flashing tape.

Scope of Use

Thermakraft Aluband Window Flashing Tapes can be used within the following scope:

- Installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier.
- Installed at joinery heads to seal flashing upstands to the wall underlay.
- To assist the overall weathertightness performance of window and door joinery installations.
- To be used in conjunction with air seals and joinery flashing systems. Installer must check for air seal product compatibility with Aluband Window Flashing Tape.
- Thermakraft Aluband Window Flashing Tape must be used with Thermakraft Corner Moulded Pieces (on windowsill corners).
- Situated in NZS3604 Wind Zones up to, and including 'Extra High'.

General

- Compatible with all Thermakraft building underlays.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.
- Thermakraft corner moulds MUST be used at flashing corners (see installation guide).

Limitations

- Must NOT be exposed to the weather/UV for more than 42 days.
- Should be installed when temperatures are above 5ºC.
- NOT designed to overcome poor detailing and workmanship of the window or door joinery installation.
- Bitumen may react with window sealants. Always check compatibility before use.

Compliance:

- Aluband should be used within the product scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1;
- Can be used on buildings constructed with timber and steel framing complying with the NZBC;
- With a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- Can be used with wall cladding systems complying with NZBC Acceptable Solution E2/AS1.

Durability:

- Thermakraft Aluband Window Flashing Tape will meet the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 [a] 50 years*, B2.3.1 [b] 15 years* and B2.3.2), E2 External Moisture Performance and F2 Hazardous Building Materials.

* **Note:** When the external cladding is maintained according to the cladding manufacturer's instructions and the cladding remains weather resistant, Thermakraft Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

- Thermakraft Aluband Window Flashing Tape has a serviceable life expectancy equal to that of the cladding, when installed in accordance with this technical specification and in accordance to the product installation guide, provided it is not exposed to the weather or ultra-violet (UV) light for more than 42 days, or is not damaged upon installation.
- Thermakraft Aluband Window Flashing Tape is designed to work on all building underlays that meet the requirements of NZBC E2/AS1 Table 23, and on all Thermakraft BRANZ Appraised wall underlays.

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Thermakraft Limited / 0800 806 595

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BRANZ Appraised
Appraisal No.878 [2019]

Issue 5, January 2020

Thermakraft

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Installation Guide

ALUBAND

Bituminous adhesive flexible window flashing tape.

Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Product usage

Aluband Window Flashing Tape is installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.

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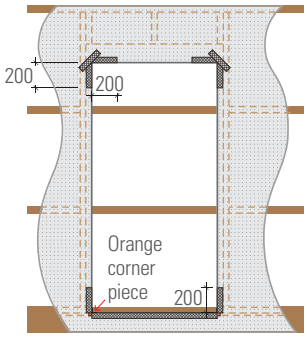
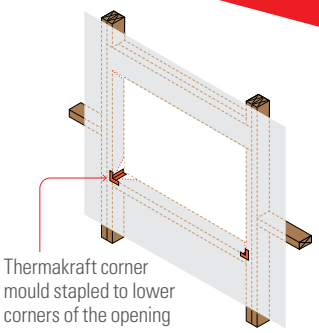
BRANZ Appraised
Appraisal No.878 [2019]

Installation Guide

Application Method

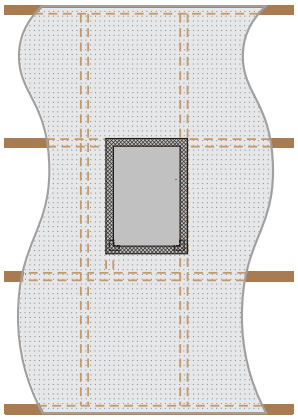
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Thermakraft Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes. Note the following: 150mm wide tape is used for 100mm wide window or door framing, and the 200mm wide tape is used for 140mm to 150mm wide reveals. (With steel framed houses use Double Sided Tape to attach the Thermakraft Aluband Corner Moulded Piece to metal framing).
- Measure 200mm up both jambs, add 400mm to the length of the window sill and cut to suit that measurement.
- First remove the release film from the tape; align the back edge of the tape with the inside edge of the sill.
- Using the Thermakraft Tool, firmly press the tape onto the wall underlay to ensure good adhesion and ensure the tape is fitted tightly into the jamb to sill corners.
- At the sill/jamb corners cut the tape from the external edge of the frame outwards. Fold flaps back onto the wall underlay/air barrier and press tape firmly for good adhesion.
- Proceed to fit the Window Flashing Tape to the top corners of the frame (200mm across lintel x 200mm down jamb).
- For window or door lintel to jamb junction, apply a butterfly using the 75mm wide x 100mm long Aluband. Fix at a 45° angle to the jamb with an overlap at the corner of 3mm.
- Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.
- Window Flashing Tape is used to seal the up stand of the window head flashing to the building underlay. (Refer to the cladding manufacturer's details).
- Aluband must NOT be left exposed to the weather or UV for more than 42 days.

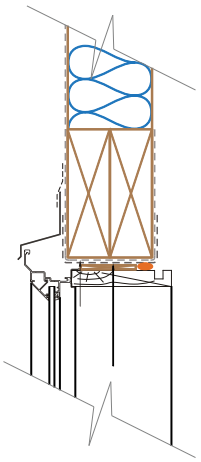




Window and door frames

- Staple orange corner piece to the bottom corner sill. Place tape 200mm up the jambs and across the full width of the sill opening. Align tape with the back of the frame opening.
- At the top corner place tape 200mm down the jamb and 200mm across the lintel. Place a strip of 75mm tape across the top corner.





Application Tips

- Always use the Thermakraft Aluband Window Flashing Tool to apply firm pressure onto the tape during installation. This will ensure proper adhesion of the tape to the building underlay or other substrates.
- Install the Aluband Window Flashing above 5°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Important Information

To assist the adhesion of Aluband window flashing tape, Thermakraft suggests the following two options this is particularly relevant in the following conditions:

- In temperatures below 5°C.
- When adhering to difficult to bond substrates such as rough/uneven surfaces.
- When the tape has been lifted or moved after initial application.

Installation Guide

Application of Heat:

- Press the window sill tape into position in the usual manner.
- Apply a gentle heat, using a heat gun on low heat to the top of the window sill tape.
- Once the adhesive starts to soften use the Thermakraft tool or a roller to firmly press the tape into the wall underlay ensuring good adhesion.
- Take care not to damage the foil face lining.

Difficult to Bond Substrates Surface Preparation:

- Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes.
- Application of Scotch® Super 77™ Spray Adhesive: When installing Aluband Flashing Tapes on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

Adhesives and Sealants:

- After the installation of Aluband window flashing tape, ensure that the edges do NOT come into contact with solvent based sealants or adhesives. Solvents in these products can adversely affect the adhesion or dissolve the bituminous adhesive and cause it to run.
- If the application of solvent based adhesives or sealants are necessary, cover the edges with Thermakraft joining tape or a true aluminium foil tape to form a barrier. With a true aluminium foil tape, the installer must test the bonding strength.
- The installer must check the compatibility of the Aluband window flashing tape with the sealant or adhesive product to ensure the components are fully compatible.

Handling and Storage

Aluband window flashing tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Issue 4, January 2020

BRANZ Appraised
Appraisal No. 878 [2019]

THERMAKRAFT ALUBAND WINDOW FLASHING TAPE

Appraisal No. 878 (2019)

This Appraisal replaces BRANZ Appraisal No. 878 (2014)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Thermakraft Aluband Window Flashing Tape in conjunction with the Thermakraft Corner Moulded Piece is a flexible flashing tape system for use around framed joinery openings as a secondary weather resistant barrier.

1.2 The system is installed into and around the framed joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing. Thermakraft Aluband Window Flashing Tape is also used at joinery heads to seal flashing upstands to the wall underlay.

Scope

2.1 Thermakraft Aluband Window Flashing Tape has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:

- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
- constructed with steel framing subject to specific engineering design with building height and floor plan area scope limitations in accordance with NZBC Acceptable Solution E2/AS1; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing system; and,
- with flexible wall underlays compatible with the flashing tape and complying with the NZBC; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High (refer to Paragraph 7.3).

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Thermakraft Aluband Window Flashing Tape meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Thermakraft Aluband Window Flashing Tape contributes to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Aluband Window Flashing Tape meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 System components and accessories supplied by Thermakraft Limited are:

- Thermakraft Aluband Window Flashing Tape is a polymeric faced, bituminous modified, self-adhesive tape with a release backing paper. The tape is supplied in rolls 200, 150 and 75 mm wide x 25 m long. The rolls are wrapped in clear polythene film.
- The Thermakraft Corner Moulded Piece is made from inert polyethylene and is coloured orange. It is used in conjunction with the Thermakraft Aluband Window Flashing Tape and building underlays as part of the Thermakraft Aluband Window Flashing Tape system.
- The Thermakraft Tool is used to ensure proper adhesion of the Thermakraft Aluband Window Flashing Tape and to achieve a tight fit into corners.

4.2 Accessories used with the system which are supplied by the installer are:

- Thermakraft Corner Moulded Piece fixings - staples, clouts or other temporary fixings to attach the corner mould to the framing prior to the installation of the Thermakraft Aluband Window Flashing Tape.
- Scotch® Super 77™ Multipurpose Adhesive is a clear spray primer.

Handling and Storage

5.1 Handling and storage of all materials supplied by Thermakraft Limited, whether on or off site, is under the control of the installer. Thermakraft Aluband Window Flashing Tape and accessories must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Thermakraft Aluband Window Flashing Tape. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Thermakraft Aluband Window Flashing Tape meets the requirements of AC148: 2001 which is an alternative solution to the version of AC148 referenced by NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5 (b). The installation method for Thermakraft Aluband Window Flashing Tape is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figures 72A and 72B.

7.2 The use of flexible flashing systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.

7.3 Thermakraft Aluband Window Flashing Tape is suitable for use over flexible wall underlays compatible with the flashing tape in NZS 3604 Wind Zones up to and including Extra High. In the Extra High Wind Zone, the flexible underlay must be installed over a rigid underlay complying with NZBC Acceptable Solution E2/AS1, Table 23.

7.4 Thermakraft Aluband Window Flashing Tape is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing timber.

7.5 Thermakraft Aluband Window Flashing Tape is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. Thermakraft Aluband Window Flashing Tape is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

7.6 When Thermakraft Aluband Window Flashing Tape is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of Thermakraft Aluband Window Flashing Tape both during normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's in-structions and the cladding remains weather resistant, Thermakraft Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

Maintenance

9.1 No maintenance is required for Thermakraft Aluband Window Flashing Tape. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Thermakraft Aluband Window Flashing Tape from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 (b), Thermakraft Aluband Window Flashing Tape may be used.

Installation Information

Installation Skill Level Requirements

12.1 All design and building work must be carried out in accordance with the Thermakraft Aluband Window Flashing Tape Technical Literature and this Appraisal by competent and experienced tradespersons conversant with flashing tapes. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License class.

General

13.1 The selected wall underlay must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The underlay is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.

13.2 Fit a Thermakraft Corner Moulded Piece into each of the bottom corners to create a seal at the corner junction. The corner piece must be fixed to the framing with staples or clouts.

13.3 Before the Thermakraft Aluband Window Flashing Tape is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion. When installing Thermakraft Aluband Window Flashing Tape on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the wall underlay/substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the underlay/substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

13.4 A length of Thermakraft Aluband Window Flashing Tape must be cut to the length of the sill plus 400 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 200 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the building underlay. The Thermakraft Tool must be used to ensure that adequate adhesion of the tape is achieved and that the tape is installed tight into the sill/jamb junction.

13.5 A 400 mm length of Thermakraft Aluband Window Flashing Tape must be installed 200 mm down the jamb and 200 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 100 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.

13.6 Thermakraft Aluband Window Flashing Tape must not be stretched. To avoid wastage, the tape can be lapped 100 mm minimum onto itself without reducing the performance of the Thermakraft Aluband Window Flashing Tape system.

13.7 If the Thermakraft Aluband Window Flashing Tape is exposed to the weather or UV light for more than 42 days, then it must be replaced with new material.

Installation Temperature

13.8 Thermakraft Aluband Window Flashing Tape must not be installed at temperatures of less than 5°C.

Inspections

13.9 The Technical Literature must be referred to during the inspection of Thermakraft Aluband Window Flashing Tape installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

14.1 Testing of Thermakraft Aluband Window Flashing Tape has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC148:2001. The adhesion of Thermakraft Aluband Window Flashing Tape to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays has been tested and found to be satisfactory.

Other Investigations

15.1 An assessment was made of the durability of Thermakraft Aluband Window Flashing Tape by BRANZ technical experts.

15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

16.1 The manufacture of Thermakraft Aluband Window Flashing Tape has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

16.2 The quality of supply to the market is the responsibility of Thermakraft Limited.

16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and wall underlays in accordance with the instructions of the designer.

16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Thermakraft Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Thermakraft Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Thermakraft Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive
Date of Issue:
18 December 2019

Thermakraft™

Product Data Sheet

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as "Building Paper" Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Thermakraft 215 comes in two roll sizes:

1250mm wide	20m long	25m^2 coverage*
1250mm wide	40m long	50m^2 coverage*

* **Note:** m2 is the roll size for actual coverage, allow for laps and joins.

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thermakraft.co.nz

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Scope of Use (Roof Application)

- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Direct fix or cavity fix.
- Can be used on roofs up to and including NZS 3604 'Extra High' wind zones.
- Refer to installation guide regarding underlay support requirements.
- Will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended.

Scope of Use (Wall Application)

- Suitable for use with both timber and steel framing, either direct fix or in conjunction with an 18mm minimum drained cavity.
- Can be used with absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with masonry veneer in accordance with NZS 3604.
- Suitable for buildings situated in NZS3604 Building Wind Zones up to and including 'Very High'.
- Thermakraft 215 can be used as an air barrier to reduce wind entry and is highly water resistant.
- Will provide temporary weather protection during construction (maximum 28 days).

General

Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.

Limitations

- In roofing applications must NOT be exposed to the weather or UV for more than 7 days.
- In wall applications must NOT be exposed to the weather or UV for more than 28 days.
- Must NOT be used under translucent sheeting.
- Is not fire retardant.
- Not suitable for School Property, please refer to Ministry of Education; Weather-Tightness & Durability requirements for School Property.

Compliance

Thermakraft 215 meets the requirements of NZBC Acceptable Solutions E2/AS1, Table 23 and NZS 2295:2006 for both wall & roof underlay.

Durability

Meets the Performance Requirements of NZBC Clause B2, Durability B2.3.1 (a) 50 years and B2.3.1 (b) 15 years, E2 External Moisture providing:

- It is installed in accordance to Thermakraft Installation Guide.
- Run length is no greater than 10 meters.
- Is NOT left exposed to the weather or UV for more than 7 days on roof.
- Is NOT left exposed to the weather or UV for more than 28 days on walls.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is installed in accordance with the MRM Code of Practice.
- Is compatible with the cladding system used.*

* **Note:** roof cladding system compatibility testing must be done first before installation.

Property Performance

NZBC E2/AS1 Wall Underlay Requirements					
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	**Absorbency**	**Vapour Resistance**	**pH of Extract**	**Shrinkage**	**Water Resistance**
Property Performance Requirement	≥ 150gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	100mm for 24 hrs
Property Performance	Pass	Pass	Pass	Pass	Pass

NZS2295:2006 Classification			
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	**Flammability Index**	**Wind Zone**	**NZS2295:2006 Index**
Property Performance Requirement		R2	R2
Property Performance	Non-Fire Retardant	Up to Extra High	Self - Support

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation method to prevent moisture build-up in the roof cavities.

Factors which adversely affect the condensation risk in roofing systems include:

- Humid, and/or cold climatic regions.
- Warm/Skillion roof construction.
- Low roof cavity air volume and restricted air movement.
- Omitting Vapour Control Layers.
- Occupancy activities which have high moisture loading on conditioned spaces.
- Ceiling penetrations and entry of warm air into roof cavities.
- Low pitched roof.
- Bulk insulation.
- Building structures ability to naturally dry construction moisture.

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer to MRM Code of Practice for details.

For passive ventilation of the roof space, it is recommended that all roof underlays are terminated at the ridge, and if not it should be slit or slotted to allow for passive ventilation. (For further information refer to the NZ MRM Roofing Code of Practice).

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Thermakraft Limited / 0800 806 595

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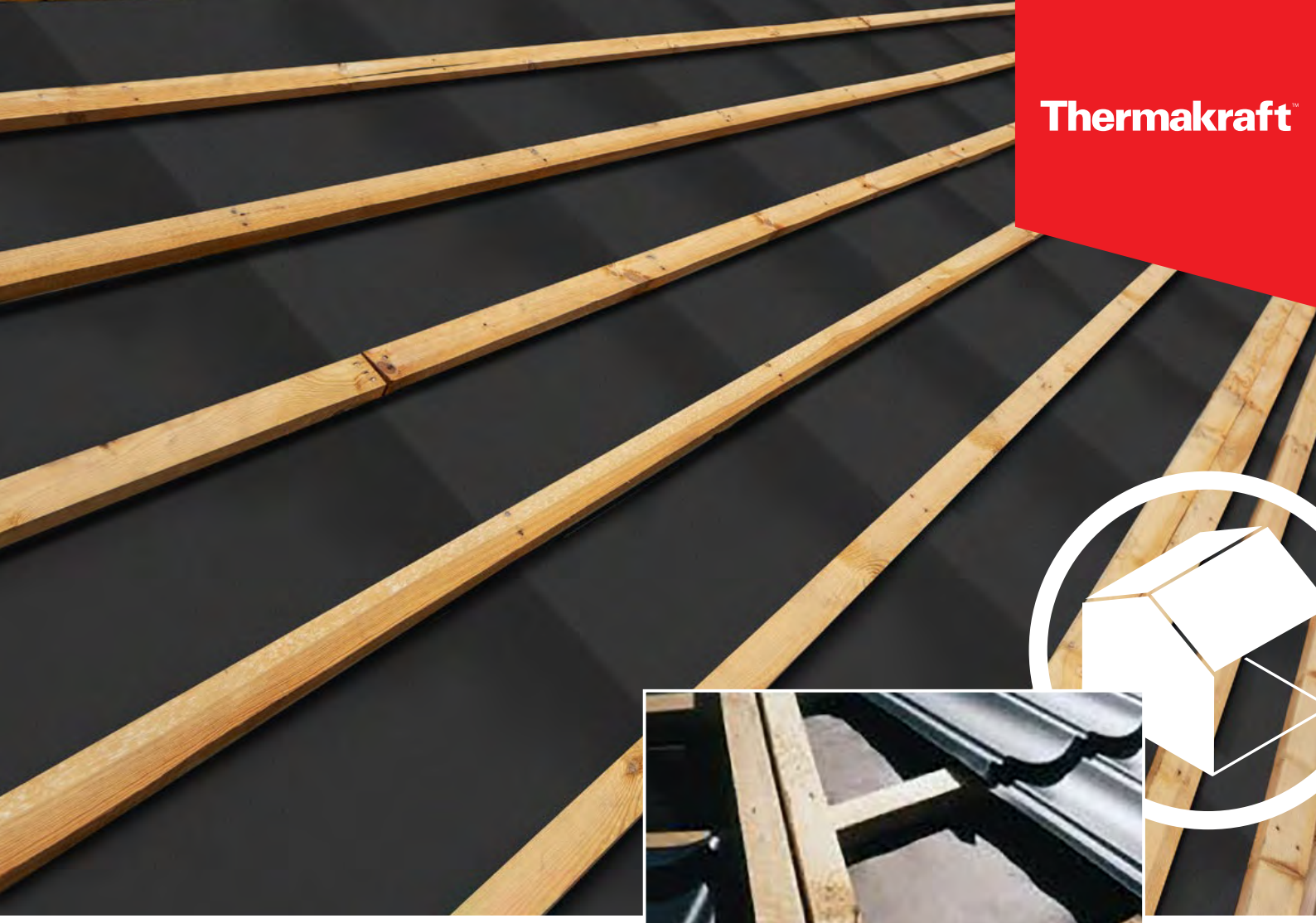
Issue 6, November 2019

Thermakraft™



Installation Guide

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as “Building Paper” Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

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Installation Guide

Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used in direct fix or cavity fix for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof Pitch	Span	Underlay Support Required	
		Horizontally Installed	Vertically Installed
≥ 10°	> 1200mm	Yes	Yes
	≤ 1200mm	No	No
< 10° (Min 3°)	> 1200mm	Yes	Yes
	≤ 1200mm	No	Yes

- Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.
  Note: Thermakraft 215 can move downwards. To prevent this, it must be "Captured" by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Thermakraft recommend using AUSMESH Safety Mesh, AUSNET hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.
- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the MRM Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

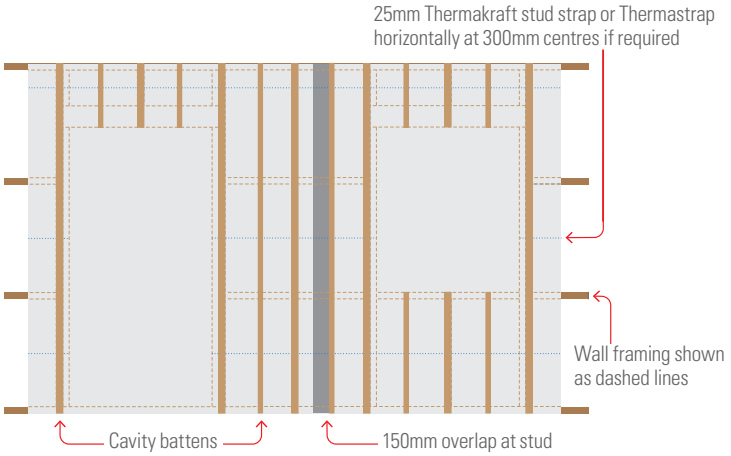
- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with NZS 3604.
- Do NOT Run Thermakraft 215 longer than 10m in length.

Application Method (Wall)

- Fix Thermakraft 215 underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.

Installation Guide

- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215 underlay is not cut and prepared for window installation until the arrival of the windows. minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft stud strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 28 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- For wall cavity systems where stud spacings are greater than 450mm centres, another means of restraint is required on the flexible underlay to prevent insulation bulge (refer to E2/AS1).
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Issue 1, November 2019

INTERIOR WATER PROOFING

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed)

Single component undertile waterproofing membrane

Low VOC content – meets Green Building Council of Australia Green Star IEQ-13 requirements

Fast drying one part acrylic membrane

Class III membrane, conforms to the requirements of AS4858:2004 Wet Area Membranes

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Seven Hills NSW 2147
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Fax: (03) 384 9779
Email: techinfo@ardexaustralia.com
Internet: www.ardex.com

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

PRODUCT DESCRIPTION

ARDEX WPM 001 (Superflex Premixed) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. ARDEX WPM 001 has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. ARDEX WPM 001 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification once cured.

ARDEX WPM 001 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. ARDEX WPM 001 is one of the fastest drying one part acrylic membranes on the market – normally ready to tile in 48 hours @ 23°C.

WPM 001 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

- Fast drying ARDEX WPM 001 can be tiled over in 48 hours in non critical areas*.
- Fibre reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement class 3 membrane as per AS 4858: 2004 Wet Area Membranes.
- Advanced acrylic: Will not re-emulsify once cured.
- Designed for tiling – Fully compatible with ARDEX tile adhesive systems.
- Water based, safe to use, low odour and easy cleaning.
- Conforms to the requirements of Australian Standards 4858: 2004 Wet Area Membranes.

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance levels

Commercial and residential.

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls and floors.

Substrates

Concrete	Cured for min. 28 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. External wet concrete should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Renders and screeds	Cured for min. 7 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Fibre cement	Wet area grade fibre cement.
Plasterboard	Wet area grade only.
Plywood	Structural plywood (PAA branded), marine grade or other wet area grade only. Special preparation is required – contact ARDEX. Not recommended for external use (refer ARDEX).
Particleboard	Wet area grade, internal use only (special preparation is required – contact ARDEX). Not recommended for external use (refer ARDEX).
Permanent Immersion	In conditions of permanent immersion, it is recommended that ARDEX WPM 002 (Superflex Two Part) is used. Must be covered with tiles for full immersion.

Contact ARDEX for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

ARDEX WPM 001 (Superflex Premixed)

The waterproofing membrane shall be ARDEX WPM 001: a one part acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Single component: 20kg (approx 15 litres) or 6.5kg (approx 5 litres).

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

TABLE 1

	Thickness per coat		Total dry film thickness (2 coats)	Theoretical coverage		Per unit
	Dry film	Wet film		Per coat	For 2 coats	
FLOORS	0.5mm	1.0mm	1.0mm	15m²	7.5m²	20kg(15L) unit
WALLS	0.25mm	0.5mm	0.5mm	30m²	15m²	20kg(15L) unit

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 20kg (15 litre) unit will cover approximately 7.5–15m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated. Refer Table 1.

DRYING TIMES

Recoat time

1–2 hours at (23°C / 50% RH) between first and second coats. Alternatively, if a woven cloth reinforcement mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. ARDEX WPM 001 is totally dry in 48 hours at 23°C / 50% RH, but can take up to 72 hours at 10°C / 50% RH in corners or for thick films.

Fully cured

The shower should not be used until the membrane has reached its full strength. ARDEX WPM 001 membrane is fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with ARDEX HydrEpoxy WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the ARDEX WPM 001.

For substrates or situations other than those listed contact ARDEX.

SAFETY DATA

ARDEX WPM 001 is non-hazardous and non dangerous. In case of skin contact, flush with running water. In case of irritation seek medical advice. If swallowed, immediately give a glass of water.

Additional information is listed in the Material Safety Data Sheet.

QUALITY PRODUCT

ARDEX WPM 001 is manufactured and tested to ARDEX procedures which are maintained in accordance with Quality System Standard ISO 9001.

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with ARDEX instructions and in applications for which they are intended.

APPLICATION

Apply ARDEX WPM 001 by brush or roller. A medium nap (12–15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat, application must consist of laying the product onto the surface and lightly finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25–40 micrometers wet film thickness while ARDEX WPM 001 needs to be applied at between 0.5 and 1.0mm per coat depending on product and application (Refer Table 1).

Critical areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian Standards 3740 – 2004 Waterproofing of wet areas within residential buildings.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall and floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards.
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2mtr) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cure silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS 3740 and the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.
12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.
14. Apply the membrane 1800mm up the walls or 80mm above the height of the shower rose within the shower recess.
15. Install the shower screen to inside edge of the hob.

Fig.1 – Shower recess – Critical areas

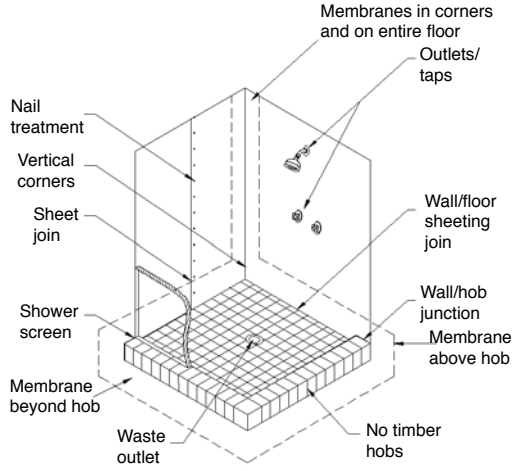
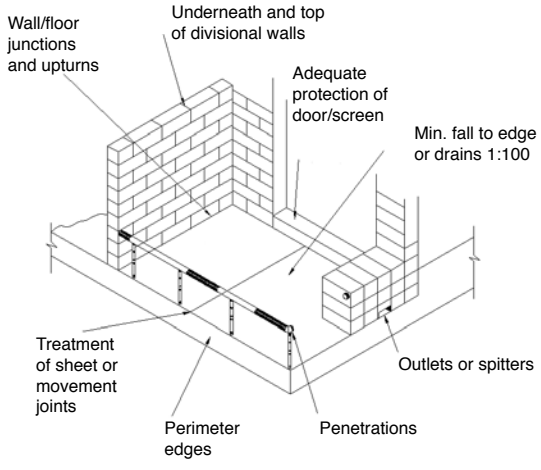


Fig.2 – Balcony – Critical areas



BALCONIES AND DECKS

1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
3. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
4. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
5. Apply the membrane as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
6. Where possible, apply the membrane prior to building divisional walls.
7. Apply the membrane to the entire balcony floor and at least 100mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
8. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
9. Apply the membrane down over the front edge of the balcony onto the drip rail.
10. Carefully seal any gaps around balcony penetrations with a neutral cure silicone prior to applying the membrane.
11. Apply the membrane down into outlets and drains, ensuring excess material is removed.
12. Ensure all weep holes are above the membrane application area.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm in 2 metre (wet areas) or 1:100 externally, must be achieved prior to tiling.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of ARDEX WPM 265 water based primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to completely dry prior to the application of the ARDEX WPM 001 membrane. This will take around 20–30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with ARDEX WPM 265 water based primer and allow to dry before applying two coats of ARDEX WPM 001 membrane in a band at least 200mm wide equidistantly across the crack and along the length of the crack.

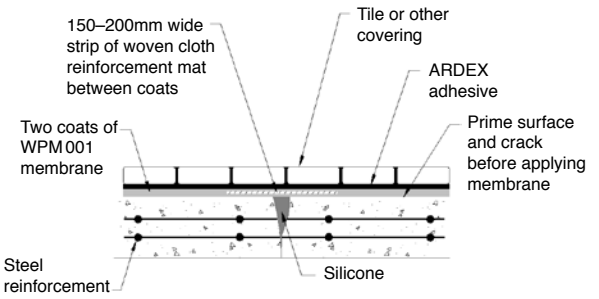
Cracks 2–6mm:

(Refer Fig.3) Prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth preferably using a fluted roller, and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

Contact your local ARDEX representative.

Fig.3 – Crack treatments



ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

MOVEMENT/CONSTRUCTION JOINTS

Movement joints (<6mm)

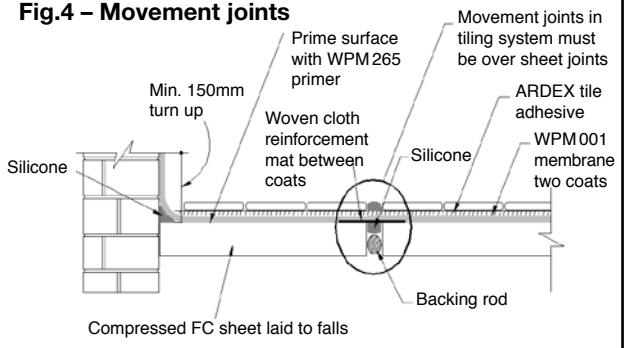
Use same procedure as in crack preparation.

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the mat and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of ARDEX Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)

Fig.4 – Movement joints



Corners and coving areas

After priming with ARDEX WPM 265 water based primer and allowing it to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates in coving areas and corners. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry.

Apply a first coat of ARDEX WPM 001 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be minimum of 1.0mm). Alternatively, if a reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry. Place a 190mm wide band of ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The ARDEX WPM 001 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of ARDEX WPM 001 to floors.

Walls

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply two coats of ARDEX WPM 001 (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheet joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 1.0mm. The flooring recommendations should be extended at least 150 mm up all perimeter walls.

Prime the surface with ARDEX WPM 265 water based primer and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1–2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone sealant. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

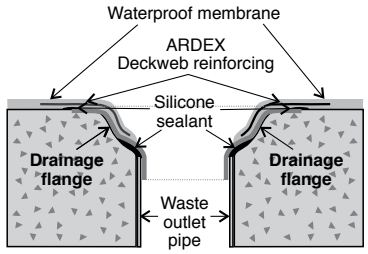
Waste outlet

Prime the surface with ARDEX WPM 265 water based primer and allow to dry. Surfaces of the outlet flange must be primed with an appropriate primer.

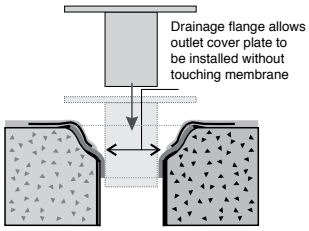
Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.

Apply ARDEX WPM 001 over the adjacent floor surface extending down into the waste outlet flange overlapping the edge of flange by at least 30 mm. Place ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig.5)

Fig.5 – Waste outlet



Outlet detail using drainage flange



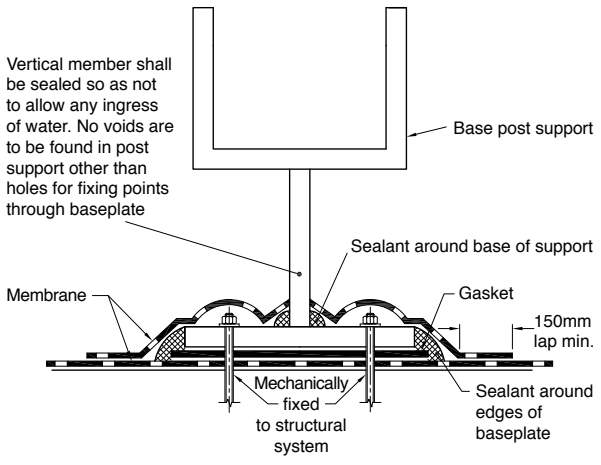
Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.

Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 12mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of ARDEX WPM 001 on the substrate and the flanged metal.

Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.0mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Fig.6 – Post membrane installation



Tiling systems

It is advisable to conduct a flood test of the waterproofed area once the membrane has cured (normally after 72 hours), and before the tiling commences. A broad range of ARDEX tile adhesives can be used over ARDEX membranes. Contact ARDEX or your nearest ARDEX stockist for advice on the most suitable system.

TECHNICAL DATA

ARDEX WPM 001 (Superflex Premixed)
Characteristics of liquid

Form and colour	Blue viscous paste
Type	Single part
Specific gravity	Approx. 1.3kg/litre
pH of liquid	8.5
Tensile strength 7 days dry AS1145	1.04 MPa
Full cure	1.92 MPa
Elongation at break 7 days dry AS1145	780%

Conforms to requirements of class 3 membrane of AS/NZ 4858: 2004 Wet Area Membranes.

VOC content	18g/L

NOTE: Most of the tests have been carried out in the ARDEX laboratory under standard conditions (23±2°C, 50±5% R.H).

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program.

Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations.

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

ARDEX Australia Pty Ltd

Technical Services Toll Free: 1800 224 070

New South Wales	Ph (02) 9851 9100	Fax (02) 9838 7970
Queensland	Ph (07) 3817 6000	Fax (07) 3881 3188
Victoria/Tasmania	Ph (03) 8339 3100	Fax (03) 9308 9332
South Australia	Ph (08) 8406 2500	Fax (08) 8345 3207
Western Australia	Ph (08) 9256 8600	Fax (08) 9455 1227

ARDEX New Zealand Ltd

Technical Services Toll Free: 0800 227 339

Auckland	Ph (09) 580 0005	Fax (09) 579 9963
Wellington	Ph (04) 568 5949	Fax (04) 568 6376
Christchurch	Ph (03) 373 6900	Fax (03) 384 9779

October 2010

Form 2A

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: **Lot 460 Hoffman Street**	
Suburb:	
Town/City **Christchurch**	Postcode:

THE OWNER

Name(s): **Lynley Bunn**	
Mailing address: **8 Havana Gardens**	
Suburb:	PO Box/Private Bag:
Town/City: **Christchurch**	Postcode:
Phone number: **0274901323**	Email address: **lyn390@gmail.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 **Andrew Siegenthaler** carried out in part 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**
Tick(√)if included *Cross (X) if excluded*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*
Primary structure			
All RBW Design work relating to B1 ( )		( ) Carried out ( ) Supervised	
Foundations and subfloor framing		Carried out in part ( ) Supervised	
Walls ✓	*Timber Framed Walls*	✓ Carried out in part ( ) Supervised	Floor Plan, Sections & Details
Roof ✓	*Timber Truss*	Carried out in part (✓) Supervised	Roof Plan & Truss Manufactures Design
Columns and beams		Carried out in part ( ) Supervised	
Bracing ✓	*Sheet Bracing*	✓ Carried out in part ( ) Supervised	Bracing Plan & Bracing Calcs
Other ( )		( ) Carried out ( ) Supervised	
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 ( )		( ) Carried out ( ) Supervised	
Damp proofing ✓	*DPM underside of slab & DPC under bottom plate*	✓ Carried out in part ( ) Supervised	Cross Section & Construction Details
Roof cladding or roof cladding system ✓	*Roof Cladding on Building Paper plus fixings*	✓ Carried out in part ( ) Supervised	Roof Plan & Construction Details
Ventilation system (for example, subfloor or cavity) ✓	*Mechanical Vents* *20mm Vavity System*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plans Cross Sections & Construction

			Details
Wall cladding or wall cladding system ✓	*Exterior Wall Claddings*	✓ Carried out in part ( ) Supervised	Elevations, Cross Sections & Construction Details
Waterproofing ✓	*Bath, Shower, WHB*	✓ Carried out in part ( ) Supervised	Details
Other ( )		( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ✓	*Smoke Alarms*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plan

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**
[List relevant clause numbers of building code]	*[Specify nature of waiver or modification of building code]*

Note: continue on another page if necessary.

ISSUED BY

Name: **Andrew Siegenthaler**	LBP or Registration number: **108550**
The practitioner is a: ✓ Design LBP ( ) Registered architect ( ) Chartered professional engineer	
Design Entity or Company (optional): **a.s.c.a.d. ltd**	
Mailing address (if different from below):	
Street address / Registered office: **59 Warwick Road**	

Suburb: **Ohoka**	Town/City: **Rangiora**
PO Box/Private Bag:	Postcode:
Phone number: **03 329 2092**	Mobile:
After Hours:	Fax:
Email address: **ascadltd@snap.net.nz**	Website:

DECLARATION

I **Andrew Siegenthaler** LBP **108550**

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; or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature: 

Date: **30/09/2020**

Rating Unit properties

Rating Unit

Property Address:	95 Aviemore Drive
Locality:	Burwood
Area:	22526.0
Site Name:	
Location:	
Valuation Roll Number:	2182374121
Capital Value:	0
Land Value:	0
Improvements Value:	0
Legal Description:	Lot 3030 DP 544332

Allotment

Owners

Christchurch City Council

Rating Unit properties

Publication	Owner	Address	Owner Role
	CDL Land New Zealand Limited	PO Box 3248 Shortland Street Auckland 1140	Property Owner

Addresses

Property Address: 95 Aviemore Drive

Address	SAID	prupi
178 Georgina Street Burwood	250112	941876
180 Georgina Street Burwood	250113	941877
182 Georgina Street Burwood	250114	941878
184 Georgina Street Burwood	250115	941879
186 Georgina Street Burwood	250116	941880
185 Georgina Street Burwood	250117	941881
183 Georgina Street Burwood	250118	941882
181 Georgina Street Burwood	250119	941883

Christchurch City Council

Rating Unit properties

179 Georgina Street Burwood	250120	941884
2 Hoffman Street Burwood	250121	941885
4 Hoffman Street Burwood	250122	941886
6 Hoffman Street Burwood	250123	941887
8 Hoffman Street Burwood	250124	941888
10 Hoffman Street Burwood	250125	941889
12 Hoffman Street Burwood	250126	941890
14 Hoffman Street Burwood	250127	941891
16 Hoffman Street Burwood	250128	941892
15 Hoffman Street Burwood	250129	941893
13 Hoffman Street Burwood	250130	941894
11 Hoffman Street Burwood	250131	941895
9 Hoffman Street Burwood	250132	941896
7 Hoffman Street Burwood	250133	941897
5 Hoffman Street Burwood	250134	941898
3 Hoffman Street Burwood	250135	941899
1 Hoffman Street Burwood	250136	941900
95 Aviemore Drive Burwood	250137	941901
129 Mairehau Road Burwood	250138	941902

Christchurch City Council

Rating Unit properties

133 Mairehau Road Burwood	250139	941903
137 Mairehau Road Burwood	250140	941904

Plans

Private Drainage

Special Book

Engineering Plan
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Rating Unit properties

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Survey Plan

Property Info

Fire District :	Your property is in the following district: Christchurch Urban Fire District.

Christchurch City Council

Rating Unit properties

Show Fire Ban FAQ

Conditions:

Property Condition Group Description	Property Condition
Administrative Purposes	Guest accommodation (including whole unit listings on Airbnb; BookaBach; etc.) generally requires a resource consent in this zone when the owner is not residing on the site. For more information, please refer to: https://ccc.govt.nz/providing-guest-accommodation/.
Built Features	Borelog/Engineer Report Image Available
Community Board	Property located in Coastal-Burwood Community Board.
Development Constraint	Council records show there is a specific condition on the use of this site: Consent Notice
District Plan	Property or part of property within the Liquefaction Management Area (LMA) Overlay which is operative.
District Plan	Property or part of property is within an Outline Development Plan area which is affected by specific provisions that are operative.
District Plan Zone	Property or part of property within the Residential New Neighbourhood Zone which is operative.
Ecan Requirement	There may be objectives, policies or rules in a regional plan or a regional bylaw that regulate land use and activities on this site. Please direct enquiries to Canterbury Regional Council (Environment Canterbury).

Christchurch City Council

Rating Unit properties

Electoral Ward	Property located in Burwood Electoral Ward
Flooding Related	This property is not in a tsunami evacuation zone. It is not necessary to evacuate in a long or strong earthquake or during an official Civil Defence tsunami warning. Residents may wish to offer to open their home to family or friends who need to evacuate from a tsunami zone, and should plan with potential guests to do so in advance.More information can be found at https://ccc.govt.nz/services/civil-defence/hazards/tsunami-evacuation-zones-and-routes/
Ground Characteristic	This property is located in an area known to have been filled. The year the fill occurred is 2020. The filling was, according to the Councils records carried out in a controlled manner and comprises Engineered Fill.
Ground Characteristic	This property is located in an area known to have been filled. The year the fill occurred is 2020. The filling was, according to the Councils records carried out in a controlled manner and comprises Sand.
Ground Characteristic	Christchurch City Council holds indicative information on liquefaction hazard for Christchurch. Information on liquefaction, including an interactive web tool, can be found on the Council website at ccc.govt.nz/liquefaction. Depending on the liquefaction potential of the area that the property is in, the Council may require site-specific investigations before granting future subdivision or building consent for the property.

Christchurch City Council

Rating Unit properties

Land Characteristic Other	Land Information New Zealand (LINZ) engaged Tonkin and Taylor to provide a Geotechnical Report on Ground Movements that occurred as a result of the Canterbury Earthquake Sequence. The report indicates this property may have been effected by a degree of earthquake induced subsidence. The report obtained by LINZ can be accessed on their website at https://www.linz.govt.nz/land/surveying/earthquakes/canterbury-earthquakes/information-for-canterbury-surveyors
Utility Related	A Council maintained vacuum sewerage chamber is located on this property. A (drainage) plan showing its location at the property is attached. For further information please contact Christchurch City Council customer services on (03) 941 8999.
Waste Collection	Your organics are collected Weekly on Wednesday. Please leave your organics at the Kerbside by 6:00 a.m.
Waste Collection	Your recycling is collected Fortnightly on the Week 2 collection cycle on a Wednesday. Please leave your recycling at the Kerbside by 6:00 a.m. Your nearest recycling depot is the Styx Mill EcoDrop.
Waste Collection	Your refuse is collected Fortnightly on the Week 2 collection cycle on a Wednesday. Please leave your rubbish at the Kerbside by 6:00 a.m. Your nearest rubbish depot is the Styx Mill EcoDrop.

Other property information:

Type	Description
PROPERTY TO BE ENDED AS A RESULT OF SUBDIVISION	

Christchurch City Council

Rating Unit properties

Building Applications

ApplicationNo.	BCN/2020/9993
Address	14 Hoffman Street Burwood
Type	PIM Only residential detached dwelling
Status	Building Consent Officer Processing
Received Date	30 September 2020
BCGranted Date	
PIMGranted Date	
CCCIssued Date	
Details	Construction of dwelling with attached garage

ApplicationNo.	BCN/2020/9739
Address	95 Aviemore Drive Burwood
Type	PIM Only residential detached dwelling
Status	Waiting For Payment
Received Date	21 September 2020
BCGranted Date	
PIMGranted Date	1 October 2020
CCCIssued Date	
Details	Construction of dwelling with attached garage - Lot 457 (2 Hoffman Street)

Christchurch City Council

Rating Unit properties

ApplicationNo.	BCN/2020/9566
Address	6 Hoffman Street Burwood
Type	PIM Only residential detached dwelling
Status	Completed
Received Date	14 September 2020
BCGranted Date	
PIMGranted Date	24 September 2020
CCCIssued Date	
Details	Construction of dwelling with attached garage - Lot 459

ApplicationNo.	BCN/2020/9559
Address	3 Hoffman Street Burwood
Type	Residential detached dwelling
Status	Under assessment
Received Date	14 September 2020
BCGranted Date	
PIMGranted Date	24 September 2020
CCCIssued Date	
Details	Construction of a dwelling with attached garage - Lot 471

ApplicationNo.	BCN/2020/9508

Christchurch City Council

Rating Unit properties

Address	16 Hoffman Street Burwood
Type	Residential detached dwelling
Status	On Hold - Building Consent Officer Processing
Received Date	11 September 2020
BCGranted Date	
PIMGranted Date	24 September 2020
CCCIssued Date	
Details	Construction of dwelling with attached garage (Lot 464 Stage U2)

ApplicationNo.	BCN/2020/10038
Address	8 Hoffman Street Burwood
Type	Online application
Status	Received
Received Date	30 September 2020
BCGranted Date	
PIMGranted Date	
CCCIssued Date	
Details	Construct 3 bedroom domestic dwelling with attached garage

Planning Applications

Christchurch City Council

Rating Unit properties

ApplicationNo.	RMA/2020/1266
Address	
Type	Land Use Consent
Received Date	19 June 2020
Issued Date	7 July 2020
Status	Processing complete
Details	Construction of a new dwelling with attached garage

Historic Subdivision Applications

Application No.	RMA/2013/1085
Address	133 Prestons Park Drive Burwood
Type	Subdivision Consent
Status	Created in error
Received Date	15 September 2020
Issued Date	
s223 Issued Date	
s224 Issued Date	
Details	434 LOT FEE SIMPLE SUBDIVISION - STAGE 2 - Sub-stages T6 and U2

Application No.	RMA/2018/1970

Rating Unit properties

Address	74 Prestons Park Drive Burwood
Type	Combined subdivision / land use consent
Status	s223 Certificate issued
Received Date	15 August 2018
Issued Date	17 December 2018
s223 Issued Date	
s224 Issued Date	
Details	Eighteen lot fee simple subdivision (with two road allotments to vest) and associated land use application

Application No.	RMA/2015/2996
Address	155 Mairehau Road Burwood
Type	Subdivision Consent
Status	Processing complete
Received Date	28 October 2015
Issued Date	15 January 2016
s223 Issued Date	08 Aug 2017
s224 Issued Date	08 Aug 2017
Details	Fee Simple Subdivision - Three Lots - Historical Reference RMA92031377

Application No.	RMA/2015/1309
Address	155 Mairehau Road Burwood

Christchurch City Council

Rating Unit properties

Type	Subdivision Consent
Status	Withdrawn
Received Date	15 May 2015
Issued Date	
s223 Issued Date	
s224 Issued Date	
Details	Fee Simple - Sixty Five Lots - Residential Layout changes - applicant to respond - Historical Reference RMA92029567

Application No.	RMA/2013/1085
Address	133 Prestons Park Drive Burwood
Type	Subdivision Consent
Status	s223 Certificate issued
Received Date	18 June 2013
Issued Date	26 June 2014
s223 Issued Date	11 Mar 2016
s224 Issued Date	14 Mar 2016
Details	434 LOT FEE SIMPLE SUBDIVISION - STAGE 2 - Historical Reference RMA92022731

Application No.	RMA/2012/462
Address	153 Mairehau Road Burwood
Type	Subdivision Consent

Christchurch City Council

Rating Unit properties

Status	Consent issued
Received Date	30 March 2012
Issued Date	19 September 2012
s223 Issued Date	
s224 Issued Date	
Details	400 LOT SUBDIVISION s223 issued 13/8/13 LT 466017 - Historical Reference RMA92019798

RFS

Rfs	LIM 70234937 (LIM)
Received Date	17 August 2020
Expiry Date	
Status	COMPLETED
Situation	
Details	APPLICATION FOR LIM INFORMATION Vacant
Description	Land Information Memorandum

RFS (CSR) - My Council Ticket

Christchurch City Council

Rating Unit properties

RFS (CSR) - Request for Service

Rfs	CSR 92504119 (VCI)
Received Date	15 September 2020
Status	CURRENT
Situation	LOT 471 DP 525627
Details	LOT 471 DP 525627 - To be renumbered to Hoffman Street.Application for Vehicle Crossing received by RAA 15/09/2020. Sent to APO for approval 15/09/2020. TRIM 20/1145109
Description	Vehicle Crossing Investigation

Other

Application No.	ADD/2020/5678
Address	95 Aviemore Drive Burwood
Type	Additional information
Status	Completed
Received Date	28 September 2020
Issued Date	28 September 2020
Details	Revised Site Plan already sent to Duty Planner re S37 Notice

Christchurch City Council

Rating Unit properties

Identifiers

GIS Rate Account ID:	187267
SAP PLNO:	1188794
GEMS RtRac ID:	0
Sap Contract Account:	73195473
prupi:	940934
Valuation Roll Number:	2182374121
Street Address ID:	248429

Christchurch City Council

Project Information Memorandum (PIM)

Application type	Residential detached dwelling
Application number	BCN/2020/10038
Applicant	A.S.C.A.D Limited 59 Warwick Road, RD 5, Rangiora 7475
Owner	Lynley Claire Bunn [redacted]
Issue date	14 October 2020
Location	8 Hoffman Street Burwood Lot 460 DP 549008
Description	Construction of dwelling with attached garage

Critical issues for this project

This summary highlights specific information required to progress an application through the various stages. Detail for these items will be found in corresponding sections of this document.

Resource consents and planning authorisations (including authorisations from Environment Canterbury) required before construction commences:

Clause	Section in this document
Non-compliance with Christchurch District Plan	Planning
Critical issue: District Plan	Planning

Information required before a building consent can be issued:

Clause	Section in this document
Sediment control: general building site	General advice on the project
Critical advice: Building restrictions / easements	General advice on the project

Information required before a code compliance certificate can be issued:

Clause	Section in this document
Critical issue: Services	Services

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

The following matters have been identified in respect of the above building project:

Planning

City or District Plan zone

This property is in the Residential New Neighbourhood zone in the Christchurch District Plan.

City or District Plan compliance

Critical issue: Implications of District Plan review on PIMs

Please note that the Christchurch District Plan may be reviewed from time to time.

The issuing of a PIM does not protect this development from future changes to the District Plan. A PIM is a statement of information relevant to the building proposal at the date of issue of the PIM, including its status under the District Plan at that time.

When any new District Plan rules come into effect, some aspects of building proposals may no longer comply, in which case a resource consent would need to be obtained. To protect against the effects of future plan changes you are able to apply for a Certificate of Compliance (if your proposal is a permitted activity) or resource consent under the current plan rules. Certificates of compliance and resource consents are valid for five years and protect a proposal against changes to the District Plan during that period.

Resource consent or other planning authorisation required

(Section 37 certificate attached)

Critical issue: Non-compliance with Christchurch District Plan

- The project does not comply with the Christchurch District Plan on the following matters:
  - **Chapter 14 Residential - 14.12 Rules - 14.12.2 Built form standards - 14.12.2.7 Landscaping:** The full length of the road frontage not used as vehicle or pedestrian access, shall be landscaped to a minimum depth of 2m. *The required landscaping has not been indicated on the proposed plans.*
  - **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Visibility Splay:** All vehicle access to and/or from a site in a residential zone, shall allow clear visibility above 1 metre within a triangle measured for a width of at least 1.5 metres either side of the entrance, and for a length at least 2 metres measured from the road boundary. *More information needs to be supplied to confirm compliance, or otherwise, with this rule.*
  - **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Access Width:** All vehicle access to and within a site in a residential zone shall have a maximum formed width of 4.5m. *The proposed access is 4.8 metres wide.*
  - **Chapter 9 Natural and Cultural Heritage - 9.4 Significant and other Trees - 9.4.4 Rules - 9.4.4.1 Activity Status Tables - 9.4.4.1.1 Permitted Activities: P12:**

    Earthworks within 5 metres of the base of any tree in:
    i. parks, public open space or road corridors in Christchurch City; or
    ii. Parks, public open space or road corridors in Akaroa as shown in Appendix 9.4.7.4;
    Activities shall be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator.

    The earthworks for driveway and vehicle crossing will be undertaken within 5 metres of the base of the street tree and no information has been provided to determine whether the works will be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator (Citycare or TreeTech).

If you wish to continue with the project your options are to either:

- Provide amended plans showing compliance with the Christchurch District Plan with your application for building consent, or
- If compliance is not achieved, an application for a resource consent must be made. No work may commence until any required resource consent is granted. If applying for a resource consent, please state the project number above as reference.

For your information, a Guide to Resource Consent Processing Costs is available from our website at ccc.govt.nz/consents-and-licences/resource-consents/resource-management-fees.

A building consent may be issued prior to the approval of this resource consent, however this will be subject to the certificate as attached.

Land characteristics and hazards

Development levels and flooding

Development levels

- **Ground Level:** Minimum section levels have been set as part of the underlying subdivision requirements. The site level is not to be lowered without consultation with a Building Consent Officer in the Council's Building Consenting Unit, Consents & Compliance group.
- **Acceptable Solution E1/AS1 - Minimum Acceptable Floor Level:** Unless using a specifically designed "alternative solution" suspended floors and slabs on ground shall be at least 150mm above the finished level of the surrounding ground immediately adjacent to the *building*, and;
  - For sites level with or above the road, no less than 150mm above the road crown on at least one cross-section through the *building* and roadway (refer figure 1 E1/AS1 Paragraph 2.0.1a).
  - For sites below the road, no less than 150mm above the lowest point on the site boundary (refer figure 2 E1/AS1 Paragraph 2.0.1b).

Ground conditions

Technical Category

- **TCNA: Technical Category Zone classification:** The sub-classification for the site is **Technical Category not applicable.** Non-residential properties in urban areas, properties in rural areas or beyond the extent of land damage mapping, and properties in the Port Hills and Banks Peninsula have not been given a Technical Category.

  Applications for building consent approval are subject to investigation by Geotechnical Engineers or engineering geologists to assess risk and provide development and mitigation advice as necessary. A report (and if necessary a foundation and drainage support design) will be required to support an application for building consent.

Land characteristics and hazards – other issues

Development constraints

- Council records show there are specific conditions on the use of this site regarding the following matters:
  - **Consent Notice:** Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific foundation design by a suitably experienced chartered engineer or by an appropriately qualified geotechnical engineer. The design shall take into consideration the potential for liquefaction and associated effects (vertical settlement and lateral spread) and shall be investigated in accordance with MBIE Guidelines "Repairing and rebuilding houses affected by

the Canterbury earthquakes" (December 2012) or subsequent revision document. Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific Any foundation design required will need to be in accordance with the technical category for the individual lots as defined by the Geotechnical Completion Report - Prestons Park Stage T6, T7 and U2 - Revision 0 prepared by Aurecon and dated 13 August 2020 and any additional restrictions noted within the report.

- **Consent Notice:** This Lot is identified as Density B and is to be developed in accordance with the relevant provisions of the Residential New Neighbourhood (Prestons) zone.

Services

Water supply

- **Residential:** A new water supply is required to be supplied for this project. The details of the position of this new connection will be required with the building consent application. Fees payable are set out in the published fee schedule which is available from our website at www.ccc.govt.nz/the-council/fees-and-charges/fees-building-control.

Critical issue: Services

- **"As-Built" Plans Unavailable:** The location of the service laterals to serve this property are not yet recorded on the Council's drainage plan record.

Reticulated systems

- **Sewer And Stormwater Discharge:** Sanitary sewer and stormwater is to be discharged to their respective laterals required to be installed as part of the underlying subdivision.
- **Local Vacuum Sewer System Zone:** This property is in an area zoned for a local vacuum sewer system within the Christchurch Wastewater Sewerage Network. For further information contact wastewatercapacity@ccc.govt.nz
- **Water Related Services Pipework Within Private Property:** The laying of sewer, stormwater and water supply pipework within private land which will remain in private ownership requires a building consent, compliance with the New Zealand Building Code, and must be installed by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Protection Of Private Drainage Systems:** The private drainage systems must be protected in an approved manner where they could be damaged by vehicular traffic, impact, tree root penetration, or any other source.
- **Sanitary Fittings And Associated Plumbing Works:** The installation of sanitary fittings and associated plumbing works must be carried out by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Interceptor / Silt Traps:** Where surface water drainage is proposed to connect directly to any open or piped stormwater system under the Council's control a master trap or silt trap, or similar device, situated in an approved position within the premises, will be required.

Roading and vehicle access

Vehicle crossings

- **Vehicle crossings** are required to be constructed in accordance with Council's Standard Specifications (a copy of which is available from the Council). On default the Council will undertake to repair or construct the crossing at the **property owner's cost**.

The Road Amenity & Asset Protection Team is to be notified 24 hours prior to:

- The concrete to the culvert being poured; *and*
- Final sealing of the crossing.

Where alterations are required to stormwater pipes or other on street facilities including but not restricted to; e.g. manhole tops, poles, trees, landscaping, signs, pedestrian crossing etc., the owner is to meet the cost of the required alterations.

The owner is required to get Council approval for any vehicle crossing before the work proceeds.

Temporary use of legal road

- An application is required where roadway, footpath or berm areas are required for development purposes. This includes areas used for waste skips, parking of contractors' vehicles, etc. Please note that use of this land without permission may result in an infringement notice being issued by our Parking Team which may include fines. Please contact the Road Amenity & Asset Protection Team on 941 8999.

Nuisance on the street

- An adequate supply of water shall be available at all times to ensure the site and truck loads are dampened down to **prevent dust and debris** being deposited on the footpath, roadway and adjoining properties. The footpath and roadway are to be cleaned down at regular intervals as required.

Licensing and regulations

LPG storage

- **Non certifiable (under 100kg):** The following requirements are *in addition to Building Code requirements* and apply to ensure compliance with the Health and Safety at Work (Hazardous Substances) Regulations 2017.
- Cylinders shall be positioned on a concrete base or concrete pavers.
- An approved hood, covering such fittings as valves, hoses, seals plus cylinder valve caps shall be fitted and the appropriate warning notice located on or beside the gas cylinders.
- Cylinders that are filled in situ shall have not less than 500mm between the valve top and underside of an opening window, while exchange cylinders shall have not less than 150mm.
- An approved method of restraint shall be installed to prevent the likelihood of cylinders falling, e.g. chain fixed to wall.
- Openings into a building or a drain are not permitted within 1 metre of the gas cylinders.
- The surface of building elements (including fences) within 1 metre of the cylinders is to be sealed to prevent gas from spilling to the neighbouring site or under the building, and be of non-combustible construction.
- 9kg cylinders for gas hobs in kitchens shall be installed outside. If this is not possible, they must be in a position where they are directly vented to the outside.

Further information is available by contacting Worksafe New Zealand 0800 030 040 or www.worksafe.govt.nz.

Development contributions

No additional demand on Council infrastructure

- **Development contribution assessment:** This development has been assessed for the requirement to pay development contributions, and has been found to **not** require a payment **at this time**. Development contribution requirements are as defined in Council's Development Contributions Policy

established under the Local Government Act 2002. Full details of the policy are available from our website at www.ccc.govt.nz/consents-and-licences/development-contributions/.

General advice on the project

Property Listed on the LLUR

- Listed Land Use Register: Environment Canterbury's Listed Land Use Register (LLUR) has identified this site as being contaminated or potentially contaminated from current or previous land use activity included on the Hazardous Substances and Industries List (HAIL). The provisions of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health may need to be complied with.

Construction nuisance

- The project must comply with the Health Act 1956, Section 29. The premises should be constructed or demolished so as not to cause a nuisance in terms of the Act (i.e. dust).

  The Resource Management Act 1991 places a general obligation on persons, including builders and demolition contractors to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level.

Critical issue: Sediment control: general building site

- The building site has the potential to discharge sediment to the Council's stormwater drainage system and/or the local waterway. A stormwater and sediment management plan will need to be provided at the time of building consent application to demonstrate mitigation or avoidance of sediment discharge beyond the site boundaries.

  For further information, "Best Practice Guidelines" can be found on the Environment Canterbury (ECan) website at esccanterbury.co.nz/sediment-control or contact the Council's Duty Building Consent Officer on telephone 941 8999.

  Note: "Building work" includes siteworks. No site preparation that may cause uncontrolled discharge of stormwater and/or sediment is to be carried out until a building consent has been obtained and stormwater diversion and sediment fences are in place.

Critical issue: Building restrictions / easements

- **"As-Built" Plans Unavailable:** As no "as-built" plans are yet available it is unknown if this site is affected by any Council easements, pipelines, open drains, waterways or building line restrictions. You are advised to check when plans become available.

General advice: Building

- **Adverse Effect On Adjoining Properties:** The developer is required to mitigate any adverse effect on adjoining properties. Failure to undertake such works may mean that the developer has some responsibility to adjacent owners at law.
- **Stormwater Control:** No person shall allow stormwater originating from within or flowing into their land to discharge onto or into a neighbouring property, other than what would naturally occur from the pre-developed condition, in a manner that is likely to cause nuisance or damage unless the discharge is authorised by a resource consent from Environment Canterbury.

Fees

Additional charges will be made on issue of a building consent if the following services are to be supplied:

- Water supply
- Footpath openings
- Road openings
- Vehicle crossing inspections

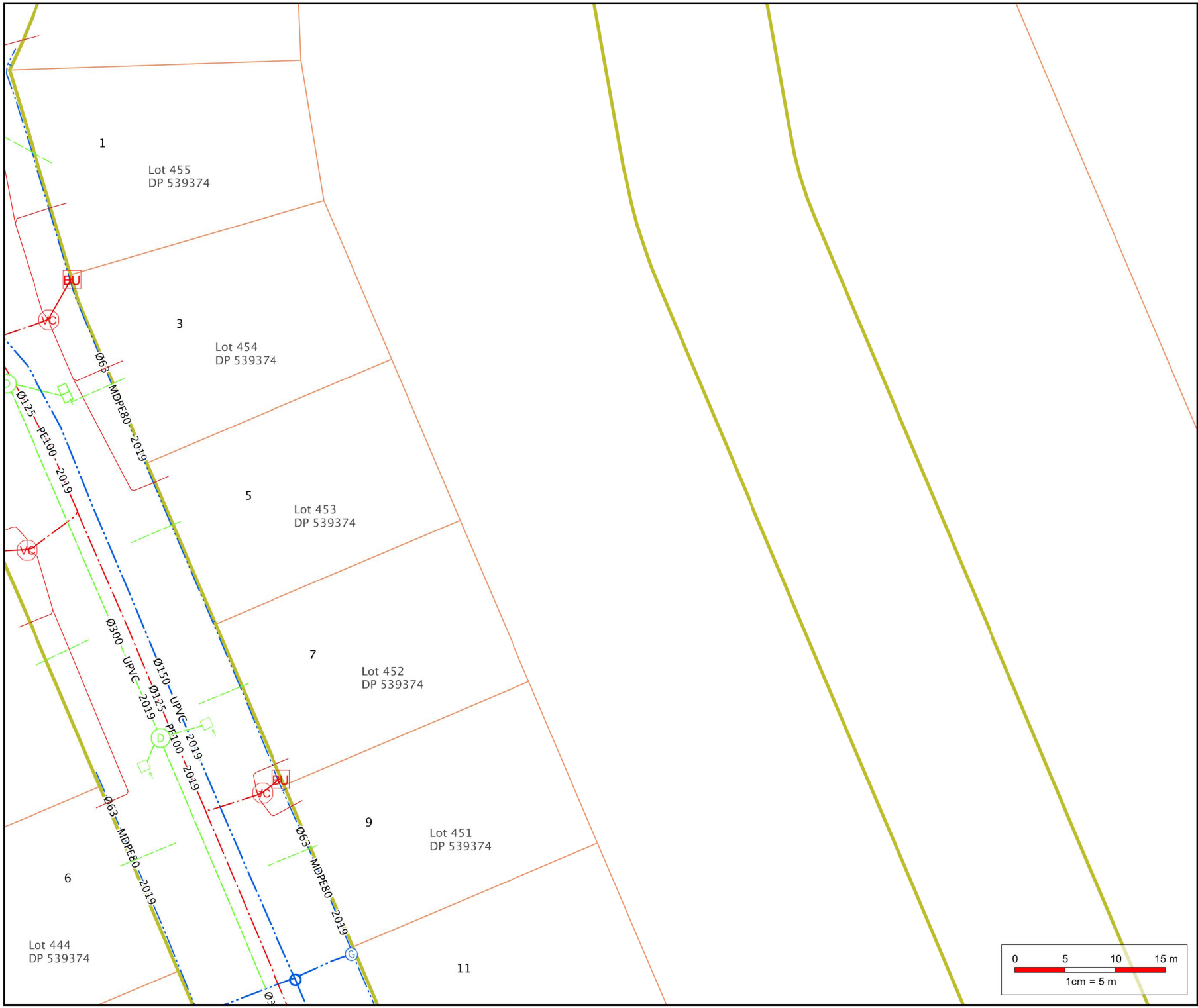
If the processing costs of this PIM application differ significantly from the fee paid, a refund or further charge will apply.

Information

- All enquiries to our Customer Call Centre on 941 8999.
- **This document is not an authorisation to commence work.** The project may only proceed subject to the issue of a building consent and any other necessary authorisations being obtained.
- A PIM is only valid at the time of issue as the information is based only upon information the council held at the time of that PIM request being made. The PIM may be re-issued if the information is either no longer relevant or is incorrect.

Signed for and on behalf of the Christchurch City Council:

Robert Carlisle
Team Leader LIM Document & Property Information



Private Drainage

Standard Infrastructure
- Bio Gas
- Condensate Trap
- End Cap
- Inlet
- Outlet
- Valve
- Main
- Cable

Water Intake/Supply
- Connector
- Bellows
- Connector
- Hydrant
- Inlet
- Meter
- Outlet
- Pump
- Restrictor
- Valve
- Air Release
- Butterfly
- Flow restriction
- Gate
- Pressure Activated
- Sluice
- Valve
- Reservoir
- Structure
- Lateral
- Main
- SubMain

Wastewater
- End Cap
- Valve
- Air Gap Separator
- Vent
- Eye
- Eye (Vertical)
- Outfall
- Pump
- Junction

Access
- Flush Manhole
- Inspection Point
- Standard Manhole
- Trap
- Vented Manhole
- Lateral Fitting
- Lateral
- Main
- Pressure Main

Wastewater
Local Pressure
- Control Panel
- Boundary Kit
- Tank System
- Site
- Vacuum Chamber
- Vacuum Breather

Stormwater
- Bend
- Change
- Eye
- Flow Restriction

Inlet
- Dome Sump
- Double Sump
- Gross Debris Trap
- Inlet
- Inlet Headwall
- Pipe End
- Silt Trap
- Single Sump
- Soak Pit
- Triple Sump

- Junction
- Standard Manhole
- Outlet
- Pump
- Structure
- Basin
- Lateral
- Main

Lateral Fitting
- Double Sump
- Single Sump
- Soak Pit
- Inspection point
- Manhole

All services
- Pipe protection
- Abandoned
- Proposed
- Out of service

Landbase
- Easement

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Christchurch City Council

ph: 941-8300 fax: 941-8385

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

2 October 2020

L C Bunn
c/-L C Bunn
[redacted]

Dear Customer

Thank you for submitting your application for a building consent

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

We are pleased to let you know that your application has been accepted for processing.

Next steps:

Your application will now be reviewed by one of our Building Consent Officers who may contact you later if we need more information.

We now need a deposit from you and have attached an invoice for this. The deposit amount will be deducted from the full cost once the consent is granted. To avoid delays, please pay the deposit amount **within two working days**.

How to pay:

An invoice is attached with information on how to make your payment. You can use internet banking to pay this fee. Please note that all payments will be credited to our account on the next business day. Payments made without the particulars, code and reference details may take longer to be lodged against the correct account.

For faster processing, you can reply to this email with proof of payment. This will need to be a screenshot or snip image of your payment transaction from your bank account. If you are paying more than one invoice, please send remittance advice to **payments@ccc.govt.nz.**

Yours sincerely

CStuart

Claudia Stuart
Vetting & Allocation Officer
03 941 6563

Tax Invoice

GST number 53-198-554

Christchurch City Council

CDL Land New Zealand Limited
c/-L C Bunn
[redacted]

Invoice number	**192065**
Invoice date	2 October 2020
Customer number	3139218

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood
Invoiced to date	$0.00

Description	GST	Amount (GST incl.)
Building consent - deposit (non-refundable	$365.22	$2,800.00
	$365.22	**$2,800.00**

Balance to be paid **$2,800.00**

(GST inclusive)

These fees are due within 30 days from the date of this invoice. Please ensure payment is made by the due date.
Where the Council has issued an invoice for the payment of any fee or charge under this section and the amount invoiced has not been paid by the stated due date, the Council may commence debt recovery action. The Council reserves the right to charge interest, payable from the date the debt became due, and recover costs incurred in pursuing recovery of the debt on a solicitor / client basis as outlined in the Fees and Charges Schedule of the Council's Long Term Plan.

To pay by Internet banking, use the following details:

Account	**02 0800 0044765 03**
Particulars	**192065**
Code	**10-337006**
Reference	**1665255**

Send remittance advice to revenue@ccc.govt.nz.

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Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Tax Invoice

GST number 53-198-554

Christchurch City Council

L C Bunn
c/-L C Bunn
[redacted]

Invoice number	192065
Invoice date	2 October 2020
Customer number	3139218

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood
Invoiced to date	$0.00

Description	GST	Amount (GST incl.)
Building consent - deposit (non-refundable	$365.22	$2,800.00
	$365.22	$2,800.00

Balance to be paid **$2,800.00**

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Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

2 October 2020

L C Bunn
c/-L C Bunn
[redacted]

Dear Customer

Thank you for submitting your application for a building consent

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

We are pleased to let you know that your application has been accepted for processing.

Next steps:

Your application will now be reviewed by one of our Building Consent Officers who may contact you later if we need more information.

We now need a deposit from you and have attached an invoice for this. The deposit amount will be deducted from the full cost once the consent is granted. To avoid delays, please pay the deposit amount **within two working days**.

How to pay:

An invoice is attached with information on how to make your payment. You can use internet banking to pay this fee. Please note that all payments will be credited to our account on the next business day. Payments made without the particulars, code and reference details may take longer to be lodged against the correct account.

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Yours sincerely

CStuart

Claudia Stuart
Vetting & Allocation Officer
03 941 6563

Tax Invoice

GST number 53-198-554

Christchurch City Council

L C Bunn
c/-L C Bunn
[redacted]

Invoice number	192065
Invoice date	2 October 2020
Customer number	3139218

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood
Invoiced to date	$0.00

Description	GST	Amount (GST incl.)
Building consent - deposit (non-refundable	$365.22	$2,800.00
	$365.22	$2,800.00

Balance to be paid $2,800.00

(GST inclusive)

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Christchurch City Council
Consenting & Compliance Group

PIM / Development Report
Water Services & Land Drainage Working Notes

Application Number:	BCN/2020/10038
Date:	5th October 2020
Address:	8 Hoffman St
Description:	Dwelling / Attached Garage (Lot 460 Stage U2)

Stage T1 had 224 14/7/20 – Lots 371-373, 376, 389-397, 407-409, 3030-3035, 3075, 3077, 3083
Stage T6 & U2 – NO 224 AS AT 1st OCTOBER

Development Constraints (PIM-B018)

Lots 398 to 406, 457 to 470, 471, 472 (DP 549008)

- **Consent Notice:** Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific foundation design by a suitably experienced chartered engineer or by an appropriately qualified geotechnical engineer. The design shall take into consideration the potential for liquefaction and associated effects (vertical settlement and lateral spread) and shall be investigated in accordance with MBIE Guidelines "Repairing and rebuilding houses affected by the Canterbury earthquakes" (December 2012) or subsequent revision document. Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific Any foundation design required will need to be in accordance with the technical category for the individual lots as defined by the Geotechnical Completion Report - Prestons Park Stage T6, T7 & U2 - Revision 0 prepared by Aurecon and dated 13 August 2020 and any additional restrictions noted within the report.

Lots 398 to 401, 403 to 406, 459 to 471 (DP 549008)

- **Consent Notice:** This Lot is identified as Density B and is to be developed in accordance with the relevant provisions of the Residential New Neighbourhood (Prestons) zone.

Lots 3036 to 3038 (DP 549008)

- **Consent Notice:** These lots are not to be further developed until a geotechnical completion report is available and confirms either TC2 or TC1 equivalent status.

Listed Land Use Register (PIM-B063)

- **Listed Land Use Register:** Environment Canterbury's *Listed Land Use Register* (LLUR) has identified this site as being contaminated or potentially contaminated from current or previous land use activity included on the *Hazardous Substances And Industries List* (HAIL). The provisions of the *National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil To Protect Human Health* may need to be complied with.

Development Levels

PIM-B001 (Development Levels)

- **Ground Level:** Minimum section levels have been set as part of the underlying subdivision requirements. The site level is not to be lowered without consultation with a Building Consent Officer in the Council's Building Consenting Unit, Consents & Compliance group.

- **Acceptable Solution E1/AS1 – Minimum Acceptable Floor Level:** Unless using a specifically designed "alternative solution" suspended floors and slabs on ground shall be at least 150mm above the finished level of the surrounding ground immediately adjacent to the *building*, and;
  - For sites level with or above the road, no less than 150mm above the road crown on at least one cross-section through the *building* and roadway (refer figure 1 E1/AS1 Paragraph 2.0.1a).
  - For sites below the road, no less than 150mm above the lowest point on the site boundary (refer figure 2 E1/AS1 Paragraph 2.0.1b).

Water Supply (PIM-S003)

- **Residential:** A new water supply is required to be supplied with this project. The details of the position of this new connection will be required with the building consent application. Fees payable are set out in the published fee schedule which is available from our website at: www.ccc.govt.nz/the-council/fees-and-charges/fees-building-control/

Services

PIM-S014C (Critical Issue: Services)

- **"As-Built" Plans Unavailable:** The location of the service laterals to serve this property are not yet recorded on the Council's drainage plan record.

PIM-S010C (Critical Issue: Subdivision Not Complete)

- **Subdivision not yet complete:** This proposal is on a site that is a part of a subdivision that has yet to be completed. Unless a certificate under Section 224 of the Resource Management Act 1991 has been issued:
  - Independent verification is required to show that the building is located in compliance with the building consent documents (which are in turn in compliance with the subdivision documents). This verification is to be in the form of a building location certificate from a registered surveyor. This must be provided prior to the foundation/floor being poured, and must show the foundation height, finished floor level and location to proposed legal boundaries. If any variation is shown from the building consent documents, these must be processed and approved as amended plans prior to continuation of work on the building.
  - Verification that the sewer, stormwater and water supply systems in the subdivision are fully operational and complying is required before connection to these systems may occur. This approval must be from the Council's Subdivision Engineers.

PIM-S013 (Reticulated Systems)

- **Sewer And Stormwater Discharge:** Sanitary sewer and stormwater is to be discharged to their respective laterals required to be installed as part of the underlying subdivision.
- **Local Vacuum Sewer System Zone:** This property is in an area zoned for a local vacuum sewer system within the Christchurch Wastewater Sewerage Network. For further information contact wastewatercapacity@ccc.govt.nz
- **Water Related Services Pipework Within Private Property:** The laying of sewer, stormwater and water supply pipework within private land which will remain in private ownership requires a building consent, compliance with the New Zealand Building Code, and must be installed by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Protection Of Private Drainage Systems:** The private drainage systems must be protected in an approved manner where they could be damaged by vehicular traffic, impact, tree root penetration, or any other source.

- **Sanitary Fittings And Associated Plumbing Works:** The installation of sanitary fittings and associated plumbing works must be carried out by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Interceptor / Silt Traps:** Where surface water drainage is proposed to connect directly to any open or piped stormwater system under the Council's control a master trap or silt trap, or similar device, situated in an approved position within the premises, will be required.

Setbacks And Building Restrictions

PIM-B067C (Critical Issue: Building Restrictions / Easements)

- **"As-Built" Plans Unavailable:** As no "as-built" plans are yet available it is unknown if this site is affected by any Council easements, pipelines, open drains, waterways or building line restrictions. You are advised to check when plans become available.

General

PIM-S001 (Drainage Plan Cannot Yet Be Provided)

- **Drainage Plan:** A drainage plan cannot yet be provided.

PIM-B066 (General Advice: Building)

- **Adverse Effect On Adjoining Properties:** The developer is required to mitigate any adverse effect on adjoining properties. Failure to undertake such works may mean that the developer has some responsibility to adjacent owners at law.
- **Stormwater Control:** No person shall allow stormwater originating from within or flowing into their land to discharge onto or into a neighbouring property, other than what would naturally occur from the pre-developed condition, in a manner that is likely to cause nuisance or damage unless the discharge is authorised by a resource consent from Environment Canterbury.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

R.W. Muir
Registrar-General
of Land

Identifier **922121**
Land Registration District **Canterbury**
Date Issued 21 July 2020

Prior References
928836

Estate	Fee Simple
Area	2.8170 hectares more or less
Legal Description	Lot 3030 Deposited Plan 544332

Registered Owners
CDL Land New Zealand Limited

Interests

Appurtenant to part formerly Lot 2 DP 395420 are drainage and other rights and easements contained in and reserved by Deed of Easement 79006 (123 D 932) See Application 7120 - 16.11.1888 at 11:50 am

10190542.1 Court Order pursuant to Section 317 Property Law Act 2007 extinguishing the drainage easements shown on DRP 3953 to the extent that they burden CTs 625607, 625857, 625858, 381181, 347815, CB9K/366, CB9K/367 and CB4A/1261 created by Deed of Easement 79006 (123 D 932) - 15.9.2015 at 2:38 pm

Land Covenant in Easement Instrument 10369087.2 - 31.3.2016 at 5:18 pm

Identifier **922121**

RESIDENTIAL NEW NEIGHBOURHOOD ZONE

Job No: BCN/2020/10038 **Planner:**

Address: 8 Hoffman St **Date:** 14/10/2020

Y	N	SITE CHARACTERISTICS	Comments
☐	☒	Heritage Item/Setting on or adjacent to site	
☒	☐	Protected tree on or adjacent to site (incl public realm tree)	street tree
☐	☒	Designation	
☐	☒	Flood Management Area: ☐ Within Fixed Minimum Floor Level Overlay ☐ Outside Fixed Minimum Floor Level Overlay ☐ High Flood Hazard Management Area ☐ Flood Ponding Area ☐ Waimakariri FMA ☐ Te Waihora/Lake Ellesmere or Wairewa/Lake Forsyth FMA	
☒	☐	Liquefaction Management Area	
☐	☒	Slope Instability Management Area ☐ Cliff Collapse ☐ Rockfall ☐ Mass Movement ☐ Remainder	
☐	☒	Character Area Overlay	
☐	☒	Overlay areas - other	
☐	☒	HAIL site	
☐	☒	Electricity Transmission Line Corridor	
☐	☒	Airport noise contours	
☐	☒	Water body	
☐	☒	Sensitive activity near road or rail – Refer Ch 6.1.7	
☐	☒	Coastal hazard – Refer City Plan	

ACTIVITY STATUS TABLES AND ACTIVITY SPECIFIC STANDARDS

Compliance			Rule	Comments
Y	N	N/A		
Permitted activities				
☒	☐	☐	**14.12.1.1 Permitted activities** Is the activity provided for as a Permitted activity? Refer rule for list.	dwelling with attached garage
☐	☐	☐	**14.12.1.1 Activity specific standards** Does the activity comply with all relevant activity specific standards? Refer rule for details.	
Other activity classifications				
☐	☐	☐	**14.12.1.2 Controlled activities** ☐ Retirement villages that meet all applicable built form standards	

ACTIVITY STATUS TABLES AND ACTIVITY SPECIFIC STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
			☐ Comprehensive residential development that meet all applicable built form standards ☐ Development of sites marked as controlled in App 8.10.14 Awatea ODP where specified standards met ☐ Residential units 6+ bedrooms ☐ **Any other activity prescribed in this rule as a controlled activity because it doesn't comply with the specified standards.**	
☐	☐	☐	**14.12.1.3 Restricted discretionary activities** ☐ Student hostels owned or operated by an education activity with 7 to 9 bedrooms ☐ Convenience activities - refer rule ☐ Integrated family health centres - refer rule ☐ Boarding house ☐ Within the 50dBA Air Noise Contour - residential activities not provided for as permitted or controlled, education activities, pre-schools or health care facilities. ☐ **Any other activity prescribed in this rule as a restricted discretionary activity because it doesn't comply with the specified standards.**	
☐	☐	☐	**14.12.1.4 Discretionary activities** ☐ Student hostels owned or operated by an education activity with more than 10 bedrooms ☐ **Any other activity prescribed in this rule as a discretionary activity because it doesn't comply with the specified standards.** ☐ **Any activity not otherwise provided for as a permitted, controlled, restricted discretionary, non-complying or prohibited activity.**	
☐	☐	☐	**14.12.1.5 Non-complying activities** ☐ Sensitive activities, buildings and fences within setbacks from National grid transmission lines or support structures. ☐ Sensitive activities, buildings and fences within setbacks from specified electricity distribution lines or support structures. ☐ Residential activity and residential units in Awatea ODP Area 2 while Chch Kart Club operating in Carrs Rd ☐ Quarrying activity	

BUILT FORM STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
☒	☐	☐	**14.12.2.1 Building height** 8m all buildings except as below 11m Comprehensive residential development that meets Rule 14.12.3.17 (except where maximum as below) 11m Retirement villages (except where maximum as below) Prestons ODP – Density A 11m, Density B 10m Wigram ODP – Density A 13m, Density B 9m	

BUILT FORM STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
			Yaldhurst ODP – on approved subdivision consent granted before 15/7/16 11m	
☒	☐	☐	**14.12.2.2 Site coverage** 40% - sites net site area 300m^2 + except as below 45% - sites net site area < 300m^2, except as below 45% - Comprehensive residential development on any site that does not meet 14.12.3.17 (development site area) 50% - Comprehensive residential development on any site that meets 14.12.3.17 (development site area) 50% - Retirement villages (entire development net site area) 80% - Prestons and Wigram ODP Density A areas 60% - Prestons and Wigram ODP Density B areas 60% - Yaldhurst ODP Density A&B areas as shown on approved subdivision consent granted before 15/7/2016 45% - Yaldhurst ODP medium density areas as shown on approved subdivision consent granted before 15/7/2016. Excludes fences, walls, retaining walls; eaves and overhangs up to 600mm from the wall; uncovered pools up to 800mm above GL; decks, balconies, bay windows, etc no more than 800mm above GL if uncovered, or if covered and/or more than 800mm above GL the max total area per site is 6m^2.	**184.99/495 = 37.37%**
☒	☐	☐	**14.12.2.3 Outdoor living space** 2 or more bedroom units: • 30m^2/unit, 16m^2 private • 4m min dimension at ground floor private/communal • At least one private space accessible from a living area of the unit • Mix of private, communal, ground level or balcony 1 bedroom units or studios on ground floor: • 16m^2 private space/unit • 4m min dimension ground floor private/communal 1 bedroom units or studios entirely on upper floor: • 16m^2 private space/unit • 6m^2 min balcony area, 1.5m min dimension • 4m min dimension ground floor private/communal • Mix of private, communal, ground level or balcony Outdoor living space must not be occupied by access or parking. NB: Does not apply to retirement village or comprehensive residential development	
☒	☐	☐	**14.12.2.4 Daylight recession plane** Refer Appendix 14.6.2 for relevant angles. Note the different measurement for overlay areas and for Yaldhurst ODP area – refer rule for details. Permitted intrusions: • Gutters/eaves up to 0.2m • Solar panels up to 2m length per boundary • Single gable end - refer 14.16.2 • Chimneys, poles, masts, lift shaft, stair well, roof water tank - refer 14.16.2	*Boundary rule if not adjoining public land*

BUILT FORM STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
			• In FMA the exemptions in Rule 5.4.1.3 apply (for activities P1-P4 in Table 5.4.1.1.b)	
☒	☐	☐	**14.12.2.5 Setback from internal boundaries and railway lines** 1.8m from neighbouring habitable space ground floor window for a min length of 2m either side of the window, where that window is within 1.8m of common internal boundary (does not apply in Density A and B sites on Yaldhurst ODP shown on subdivision consent granted before 15/7/2016) 4m from rail corridor boundary for all buildings, balconies, decks on sites adjacent to or abutting railway lines 1m from boundary adjoining an access 1m for all other buildings No setback for: • Accessory building - up to 10.1m total length of parts of the building within 1m of boundary • Buildings that share a common wall along an internal boundary Additional setbacks required as per Prestons ODP Setbacks do not apply to the sites shown on Yaldhurst ODP where subdivision consent granted before 15/7/2016 unless existing residential unit demolished and rebuilt. Retirement village/comprehensive residential development – rule only applies to internal boundaries on perimeter of entire development.	*Internal boundary setback is a boundary rule if not adjoining public land*
☒	☐	☐	**14.12.2.6 Setback and distance to living area windows and balconies** 3m - Living area windows ground level 4m - Living area windows and balconies above ground floor level Retirement village/comprehensive residential development – rule only applies to internal boundaries on perimeter of entire development.	*Boundary rule if not adjoining public land* **3m compliant**
☐	☒	☐	**14.12.2.7 Landscaping** Full length road frontage excluding vehicle/pedestrian access 2m depth landscaping Additional landscaping in • Prestons ODP as per narrative section 1 • Highfield ODP as per narrative section 8 Excludes comprehensive residential development	
☐	☐	☒	**14.12.2.8 Fencing in road boundary setback** 1.2m max height in building setback Prestons ODP area 1.2m max height or 2m where fence at least 50% transparent Additional fencing requirements in Prestons ODP – refer narrative section 1 Exterior wall of building/accessory building not a fence/screening structure Doesn't apply to internal boundaries between residential, commercial or industrial zones, or to comprehensive residential development	
☐	☐	☒	**14.11.2.9 Parking areas**	

BUILT FORM STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
			Parking areas separated from adjoining roads by planting, fences or combination of both. Standards in 14.2.2.7 (Fencing) and 14.2.2.8 (Fencing in road boundary setback) apply. Does not apply to retirement village or comprehensive residential development	
☒	☐	☐	**14.12.2.10 Garages** Max 6.5m wide and </=50% of ground floor elevation from any one road boundary 5.5m from shared access/road boundary where door faces this Does not apply to: • sites shown on RMA92029514 approved plans Yaldhurst ODP (HPRM ref: 15/689666) • retirement village or comprehensive residential development	**6.418m wide** **elevation ok** **5.5m setback compliant**
☒	☐	☐	**14.12.2.11 Road boundary building setback** 4m except for the following 3m – Prestons and Yaldhurst ODP areas 2m – Wigram OPD – Density A only Does not apply to comprehensive residential development	
☒	☐	☐	**14.12.2.12 Ground floor habitable space and overlooking of street** Ground floor habitable space with 2m^2 window facing road boundary Does not apply to retirement village or comprehensive residential development	
☐	☐	☒	**14.12.2.13 Service, storage and waste management spaces** Multi-unit residential complexes and social housing complexes only: 2.25m^2 min dim 1.5m outdoor/indoor space at ground floor level for waste/recycling bins per residential unit 3m^2 min dim 1.5m outdoor space at ground floor level for washing lines Provided individual or within a dedicated communal space Does not apply to retirement village or comprehensive residential development or to a residential unit constructed as at 15/7/2016.	
☒	☐	☐	**14.12.2.14 Minimum unit size** Min net floor area (includes toilets and bathrooms, but excludes parking ares, garages and balconies): • Studio = 35m^2 • 1 bedroom = 45m^2 • 2 bedrooms = 60m^2 • 3+ bedrooms = 90m^2 Does not apply to units in a retirement village or a comprehensive residential development.	
☒	☐	☐	**14.12.2.15 Water supply for fire fighting** All residential units - via the reticulated system and in accordance with Code of Practice.	

BUILT FORM STANDARDS				
Compliance			Rule	Comments
Y	N	N/A		
☐	☐	☒	**14.12.2.16 Outline development plan** Any activity – in accordance with development requirements in ODP	
☐	☐	☒	**14.12.2.17 Comprehensive residential developments – development site area** 6000m^2 minimum area for comprehensive residential development	

CHAPTER 7 - TRANSPORT RULES				
Compliance			Rule	Comments
Y	N	N/A		
7.4.2 Rules				
☒	☐	☐	**7.4.2.1 P1 7.4.3.1 Minimum number of car parks** As per Table 7.5.1.1 in Appendix 7.5.1 Permitted reductions are in Appendix 7.5.14.	
☒	☐	☐	**7.4.2.1 P1 7.4.3.1 Minimum dimension of car parks** Where car parks are available to the general public, Appendix 7.5.1 Table 7.5.1.3	
☐	☐	☒	**7.4.2.1 P1 7.4.3.1 Mobility car parks** Buildings with GFA > 2,500m^2 and other activities where standard parks are provided (except residential developments with less than 3 units), Appendix 7.5.1 Table 7.5.1.2	
☒	☐	☐	**7.4.2.1 P2 7.4.3.2 Minimum number of cycle parking facilities** All activities, Appendix 7.5.2.	
☐	☐	☒	**7.4.2.1 P3 7.4.3.3 Minimum number of loading spaces** All activities where standard car parks are provided, Appendix 7.5.3.	
☐	☐	☒	**7.4.2.1 P4 7.4.3.4 Manoeuvring for parking and loading areas** On-site manoeuvring area for all activities with a vehicle access Appendix 7.5.6 On-site vehicle manoeuvring area to ensure forward movement off site - all activities with access to arterial road; access to collector road where 3 or more parking spaces provided; access to 6 or more parking spaces; access to a heavy vehicle bay	
☐	☐	☒	**7.4.2.1 P5 7.4.3.5 Gradient of parking and loading areas** Non-residential activities with vehicle access.	
☐	☐	☒	**7.4.2.1 P6 7.4.3.6 Design of parking and loading areas** Lighting - non-residential activities with parking/loading areas used during darkness. Formed, sealed, drained and marked out - any urban activity except residential with less than 3 car parks; sites with access off unsealed road; temporary activities.	
☐	☒	☐	**7.4.2.1 P7 7.4.3.7 Access design** Access standards - all activities with vehicle access, Appendix 7.5.7.	**4.8m wide** **no visibility**

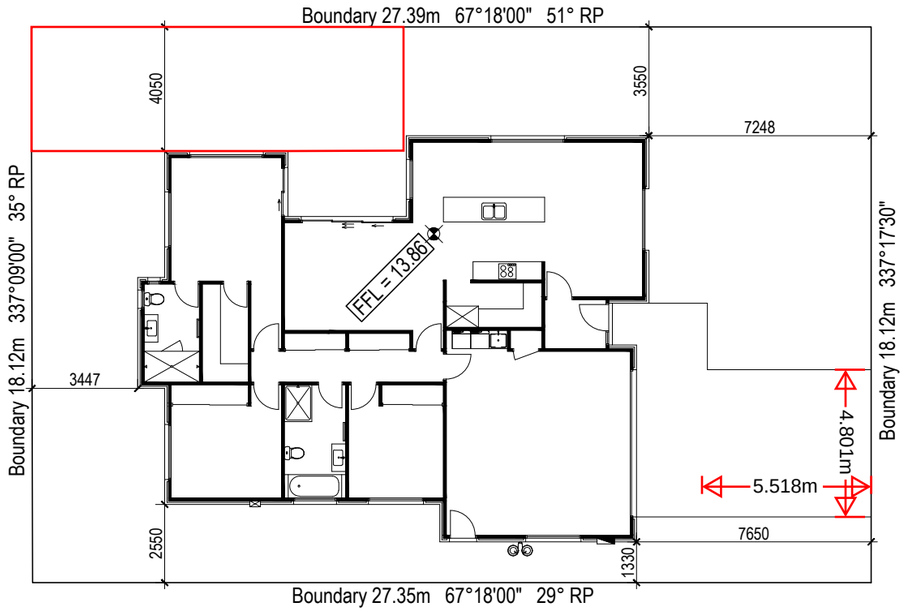
CHAPTER 7 - TRANSPORT RULES				
Compliance			Rule	Comments
Y	N	N/A		
			Queue space - 4 or more car parks or residential units, Appendix 7.5.8. Pedestrian warning system or visibility splay Appendix 7.5.9 - access to urban road serving more than 15 car parks or more than 10 HVM per day, and/or on key pedestrian frontage.	
☒	☐	☐	**7.4.2.1 P8 7.4.3.8(a) Provision of vehicle crossings** All activities with vehicle access to road or service lane.	
☐	☐	☒	**7.4.2.1 P8 7.2.3.8 (b) & (c) Design of vehicle crossings** Arterial road or collector road with speed limit 70km/hr or more, and rural selling places, Appendix 7.5.10	
☐	☐	☒	**7.4.2.1 P8 7.2.3.8(d) Spacing of vehicle crossings** On roads with speed limit 70 km/hr or more, Appendix 7.5.11 Table 7.5.11.1	
☒	☐	☐	**7.4.2.1 P8 7.2.3.8(e) Maximum number of vehicle crossings** All activities Appendix 7.5.11 Table 7.5.11.2.	
☒	☐	☐	**7.4.2.1 P8 7.2.3.8(f) Distance between vehicle crossings and intersections** All activities Appendix 7.5.11 Table 7.5.11.4	
☐	☐	☒	**7.4.2.1 P8 7.2.3.8(g) Sightlines for crossings on rural roads** Appendix 7.11 Fig 7.15	
☐	☐	☒	**7.4.2.1 P9 7.4.3.9 Location of buildings and access in relation to road/rail level crossings**	
☐	☐	☒	**7.4.2.1 P10 7.4.3.10 High trip generators** - as specified in rule.	
7.4.2.2 Controlled activities				
☐	☐	☐	**C1** Any activity not complying with 7.4.3.10 High trip generators where: - The land use is otherwise permitted in the zone; and - Does not exceed the thresholds in Table 7.4.4.19.1; and - Access not obtained from state highway, major arterial, or crosses railway line; and	
7.4.2.3 Restricted discretionary activities				
☐	☐	☐	**RD1** Any activity that doesn't comply with standards in rule 7.4.3 or requires consent under 7.4.3.10 except where provided for as a controlled activity	
7.4.2.5 Non complying activities				
☐	☐	☐	**NC2** Any building/structure that exceeds 2.5m in height within i. 12m of centre line of 110kV or 220kV National Grid transmission line ii. 10m of centre line of 66kV National Grid transmission line	

GENERAL RULES				
Compliance			Rule	Comments
Y	N	N/A		
Natural hazard rules - Chapter 5 DP				
☐	☐	☒	Flood hazard rules – Chapter 5.4	
☒	☐	☐	Liquefaction management rules – Chapter 5.5	
☐	☐	☒	Slope Instability rules – Chapter 5.6	
Other provisions				
☐	☐	☒	Hazardous substances – Chapter 4	
☐	☐	☒	Noise – Chapter 6.1	
☐	☐	☒	Outdoor lighting – Chapter 6.3	
☐	☐	☒	Aircraft Protection – Chapter 6.7	
☐	☐	☒	Water Body setbacks Chapter 6.6	
☐	☐	☒	Sign rules – Chapter 6.8	
☐	☐	☒	Licensed premises/sale of alcohol - Chapter 6.9	
☒	☐	☐	Earthworks – Chapter 8.9	
☐	☐	☒	Indigenous biodiversity – Chapter 9.1	
☐	☐	☒	Landscapes and natural character – Chapter 9.2	
☐	☐	☒	Historic Heritage – Chapter 9.3	
☐	☒	☐	Trees – Chapter 9.4	
☐	☐	☒	Ngai Tahu values – Chapter 9.5	
☐	☐	☒	Coastal environment – Chapter 9.6	
NES – Managing Contaminants in Soil to Protect Human Health				
☐	☐	☒	Applies if site has been used for a HAIL activity, and proposed activity involves disturbance of soil, change of land use, subdivision, removal of fuel storage tank, or soil sampling. Preliminary Site Investigation may be required.	

RMA ACTIVITY & APPLICATION TYPE ASSESSMENT:				
Y	N	N/A	RMA provision	Comments
☐	☐	☐	**Is this a 'boundary activity', as defined in s87AAB?** • The only DP rules infringed are 'boundary rules' • The infringed boundary is not a public boundary Note: A boundary activity will only be permitted if all information required by s87BA is provided, including written approval from owners of adjoining allotments.	
☐	☐	☐	**Is this a Fast track application as defined in s87AAC?** • A controlled activity (but no other activities) under the Plan. Does not include subdivision. • Electronic address for service provided • Must be non-notified and no s104 hearing	*Not applicable to PIMs*
☐	☐	☐	**Is the application for a 'residential activity' for the purpose of the notification decision, as defined in s95A?**	*Not applicable to PIMs*

			• An activity that requires resource consent under a regional or district plan and that is • associated with the construction, alteration, or use of 1 or more dwellinghouses and is • on land that, under a district plan, is intended to be used solely or principally for residential purposes (i.e. Residential and Papakainga zones)	

GENERAL COMMENTS:



HOFFMAN STREET

N

Lot 460
DP 549008

Hoffman Street
Prestons Park
CHRISTCHURCH

Site Coverage:

184.7m² / 495.0m² = 37.3%

NZBC F5: All Construction work on the building shall be performed in a manner that avoids the likelihood of:
(a) Objects falling onto people on or off the site,
(b) Objects falling on property off the site,
(c) Other hazards arising on the site affecting people off the site and other property, and
(d) Unauthorised entry of children to hazards on the site

ALLOW FOR STEPS OR LANDSCAPING TO ALL EXTERNAL DOORS SO STEP FROM FFL NO GREATER THAN 190mm (100mm min)

Anti-slip: on all access routes both internal & external, provide Anti-slip surface complying with NZBC D1/AS Table 2 (except surfaces in side Entry Doors of housing maybe considered dry areas)

SITE SAFETY
Allow for and maintain
- 2m high galv chainlink netting fencing to street front
- where side fencing not in place use same 2m high fencing
- where water hazards are present use same 2m high fencing

a . s . c . a . d .
limited
ascadltd@snap.net.nz
0272 838 775

job title:
BUNN HOUSE

drawing title:
SITE PLAN

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK

DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES

scale:
1:200
Job No.:
-

page:
01
of: 22
DATE: 30/09/2020

Type 1 Smoke alarm to comply with NZBC clause F7, with Hush & Test facilities

All Lintels SG8 unless otherwise stated

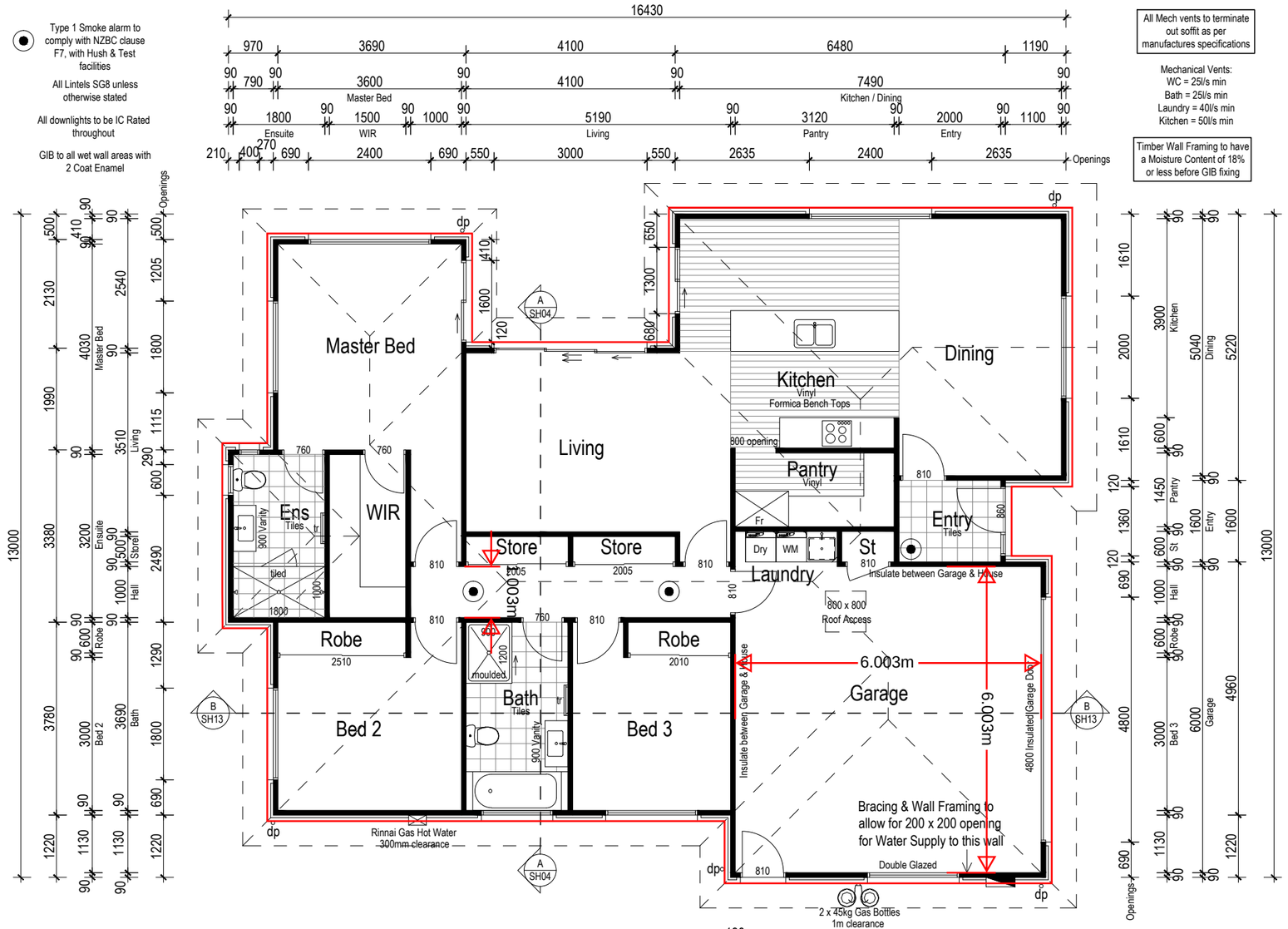
All downlights to be IC Rated throughout

GIB to all wet wall areas with 2 Coat Enamel

All Mech vents to terminate out soffit as per manufactures specifications

Mechanical Vents:
WC = 25l/s min
Bath = 25l/s min
Laundry = 40l/s min
Kitchen = 50l/s min

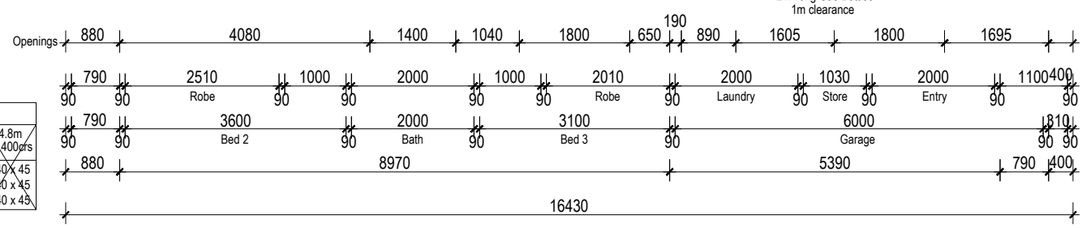
Timber Wall Framing to have a Moisture Content of 18% or less before GIB fixing



SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
INTERNAL WALLS
Light & Heavy Roof
Wind Zone = All

Loaded Dimension of Wall	Stud Size for Max Height of:			
	3.0m @ 600crs	3.6m @ 600crs	4.2m @ 400crs	4.8m @ 400crs
2.0	90 x 45	90 x 70	90 x 90	140 x 45
4.0	90 x 45	90 x 70	90 x 90	140 x 45
6.0	90 x 45	90 x 70	90 x 90	140 x 45

Note: Dwangs @ 800crs max



184.7m² OVER FOUNDATION

SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
Light & Heavy Roof
Wind Zone = High

Loaded Dimension of Wall	Stud Size for Max Height of:					
	2.4m @ 600crs	2.7m @ 400crs	3.0m @ 300crs	3.6m @ 300crs	4.2m @ 300crs	4.8m @ 400crs
2.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
4.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
6.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90

Note: Dwangs @ 800crs max

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drawing title: FLOOR PLAN

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WORKING DRAWINGS

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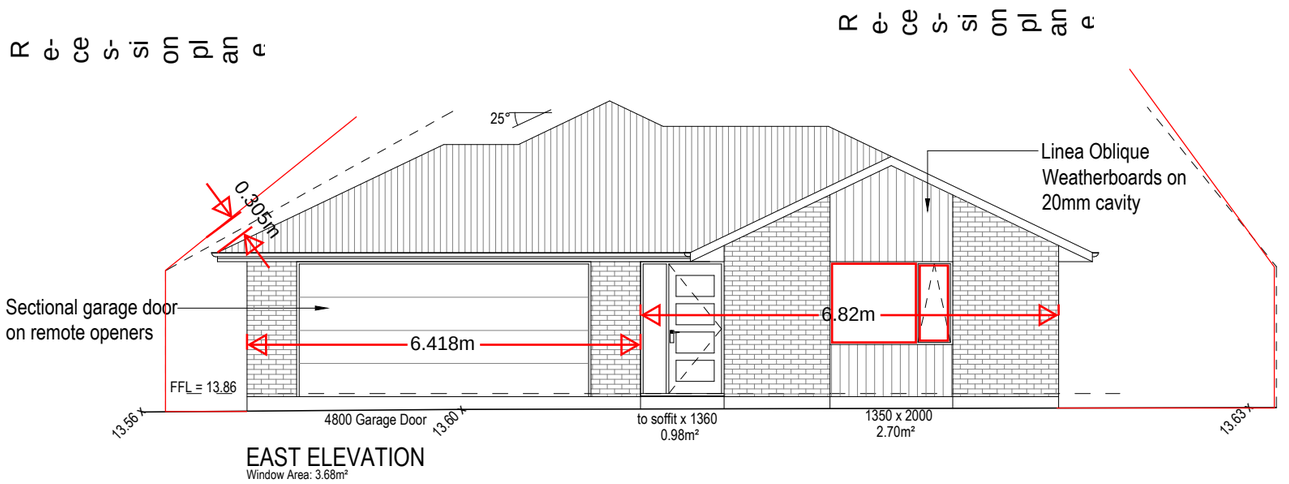
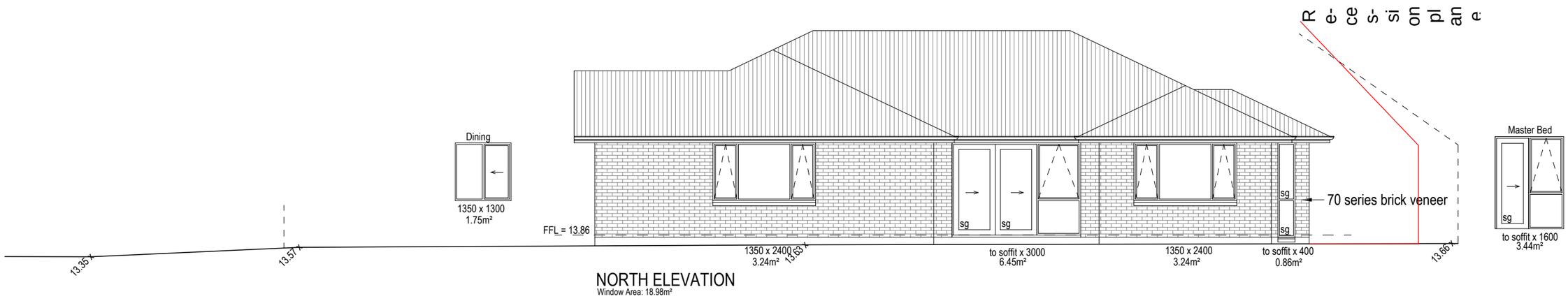


EAST ELEVATION
Window Area: 3.68m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



NORTH ELEVATION
Window Area: 18.98m²

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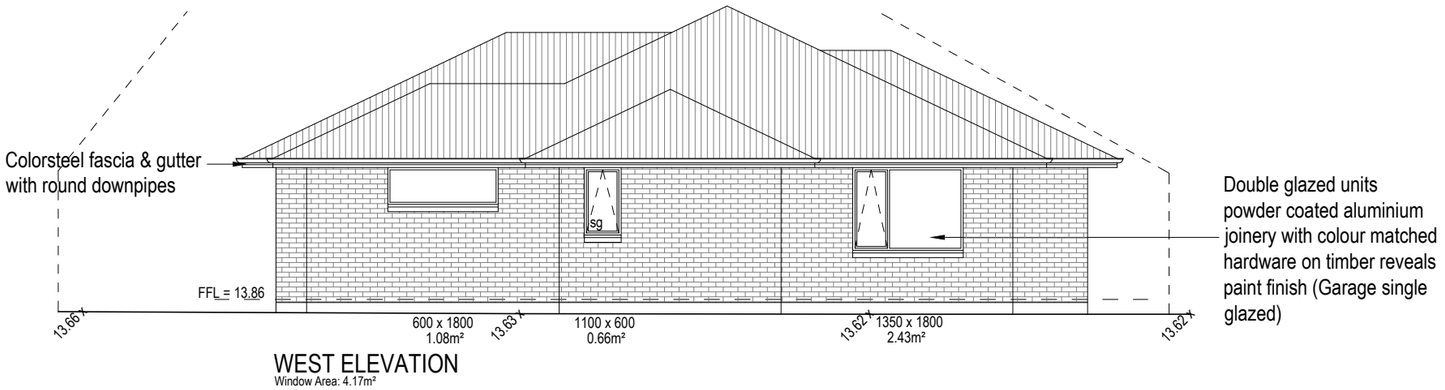
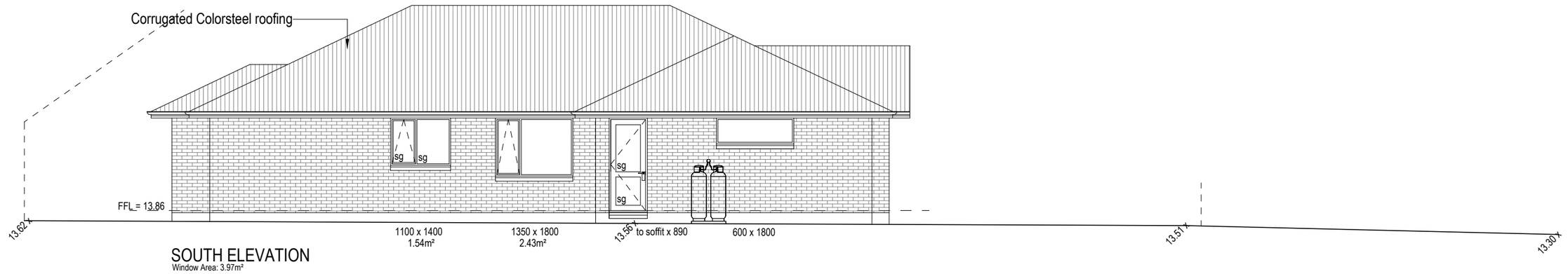


WEST ELEVATION

Window Area: 4.17m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



SOUTH ELEVATION

Window Area: 3.97m²

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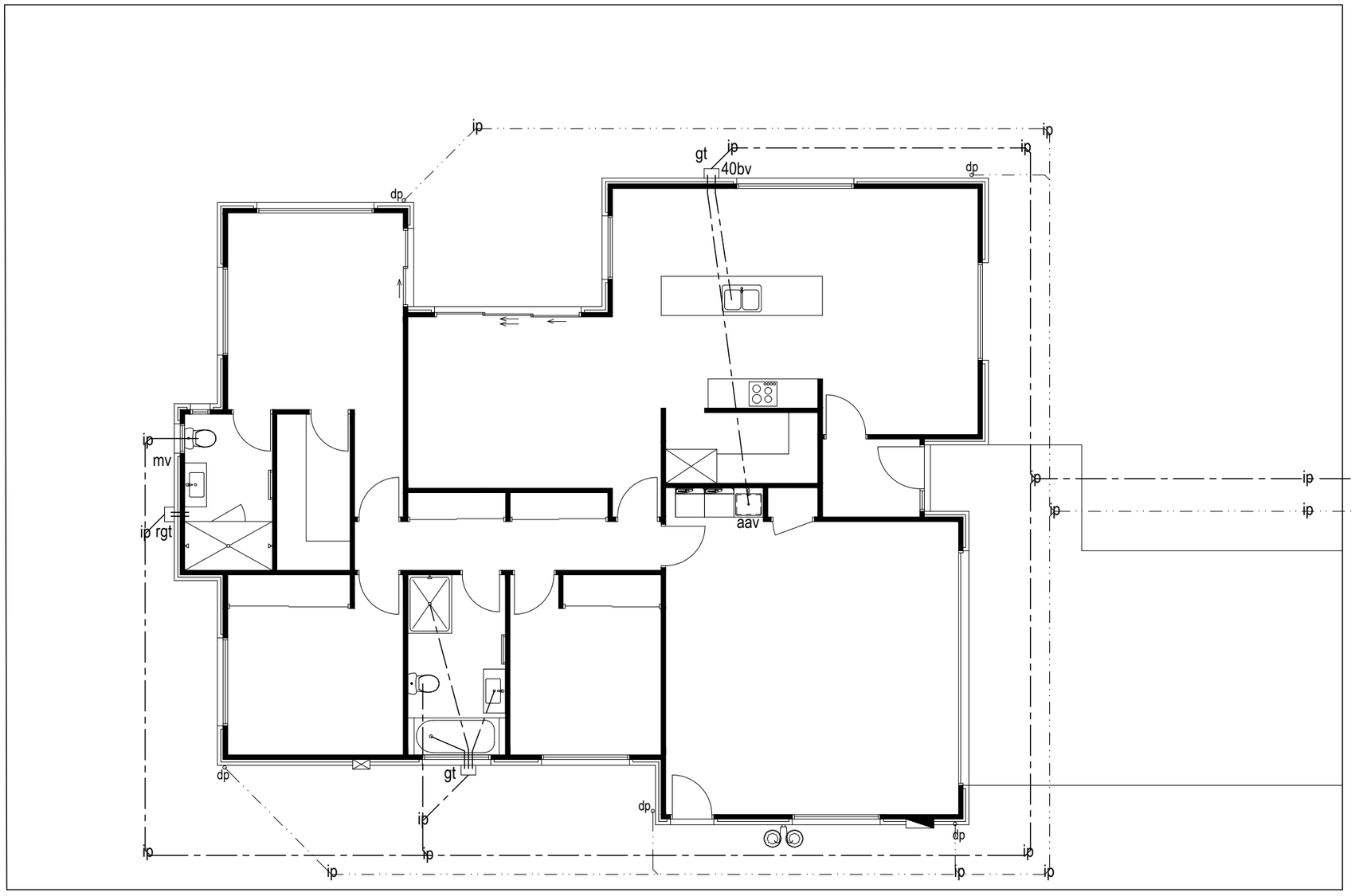

SANITARY FIXTURE	FLOW RATE/TEMP	PIPE DIAMETER
Bath	0.3 at 45°C	15mm
Sink	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Laundry Tub	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Basin	0.1 at 45°C	10mm
Shower	0.1 at 42°C	20mm

PIPE DIAMETER	MAXIMUM DISTANCE BETWEEN SUPPORTS (mm)	
	VERTICAL PIPE	GRADED PIPE
32 to 50	1000	500
65 to 100	1200	1000
Greater than 100	1800	1200

All drains laid at 1:120 to be laid with a verifiable leveling device

Relief GT - top of GT to be 150mm below overflow level of lowest sanitary fixture. FGL around Relief GT to be no higher than 13.61 (13.68 if paved)	13.86 = FFL - 0.15 = Shower Recess to Top GT - 0.10 = Top GT to FGL 13.61 = FGL

All pipes in Concrete to have Denso Tape (synthetic fabric based tape impregnated and coated with organic petroleum based compounds) applied

Pipes shall incorporate expansion joints in accordance with Chapter 8 of NZS7643

Hot water pipes to be sized according to NZBC G12 & NZS 4305. Mains Pressure: 15mm dia allows 12m max pipe length. Pipe length beyond this must be lagged

SANITARY FIXTURE	MIN PIPE DIA	MIN GRADE
Basin	32mm	1:20
Bath	40mm	1:40
Washing Machine	40mm	1:40
Kitchen Sink / Dish Washer	50mm	1:40
Laundry Sink	40mm	1:30
Shower	40mm	1:40
WC	100mm	1:60
SEWER PIPE	100mm	1:60
STORMWATER PIPE	100mm	1:120

Main Vent (MV) to terminate either:
- 3.0m above ground level
- 600mm above windows / openings
- 150mm above roof
- 600mm above eaves / parapets

HWC Relief Drain = 20mm Copper Pipe

VENT PIPES:
Discharge Pipes upto 40mm dia = 32mm Vent Pipe
Discharge Pipes over 40mm dia = 40mm Vent Pipe
Main Drain Vent Pipe = 80mm Vent Pipe

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SERVICES PLAN

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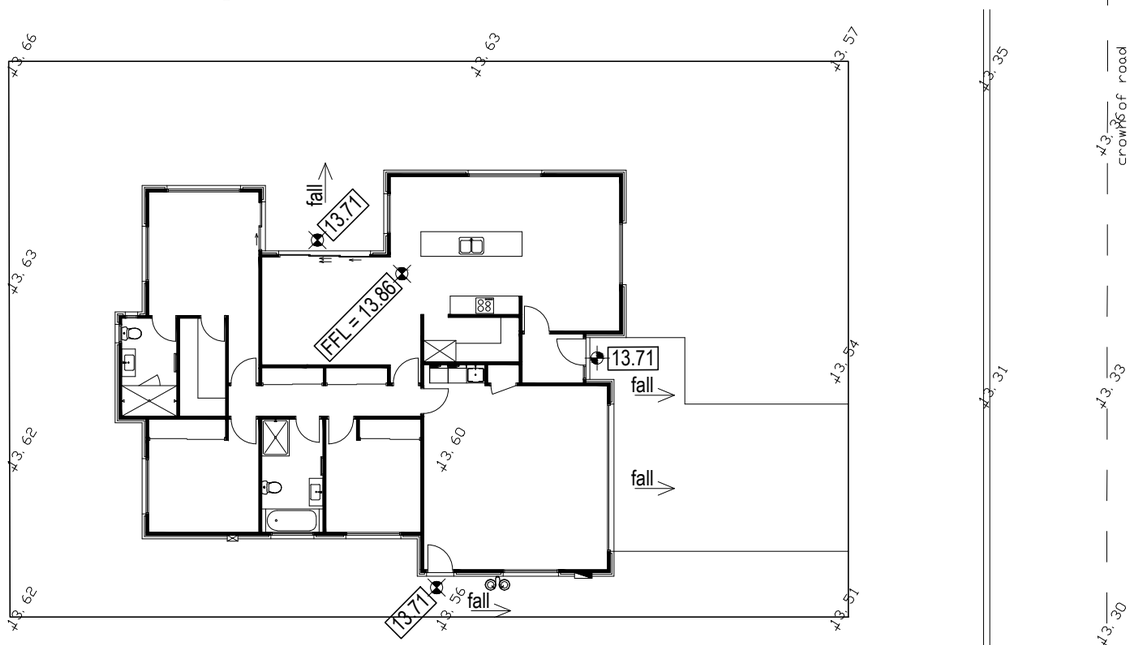
SURVEY ORIGIN DATA
- The property data has been sourced from Aurecon (May 2019) and is subject to final legal review by Land Information NZ (LINZ)
- Vertical elevations are in the terms of Christchurch Drainage Datum, SCIRT published June 2011
- The origin of Levels is BM 3257 (EHDK). RL 15.160m



CLEARANCES:
FFL to Ground = 200mm min (Brick)
FFL to Ground = 225mm min (WB)

Fall Ground away from building at 1:30 for atleast 1m

FFL to Paving = 150mm min
Fall Paving away from building

FALL DRIVE & PATHS
AT 1:100 Min

10.62 = Proposed levels
+10.59 = Existing levels

Fall Drive towards Gardens & Grassed areas as much as possible for water run off

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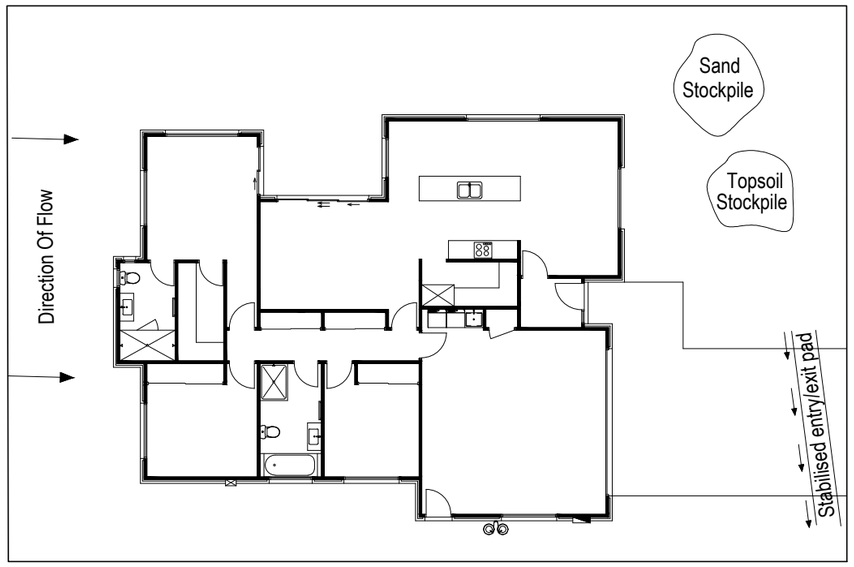

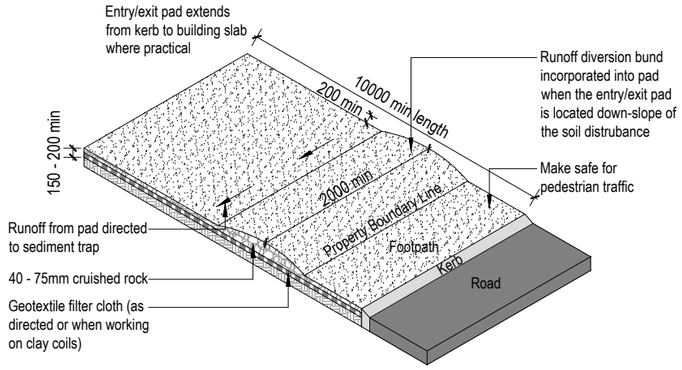

STABILISED ENTRY/EXIT PAD

Remove Stablisied Entry/Exit Pad apon completion of the formed driveway

Notes:

1. All erosion and sediment control structures to be inspected each working day and maintained in good working order

2. All ground cover vegetation outside the immediate building area to be preserved during the building phase

3. All erosion and sediment control measures to be installed prior to commencement of major earthworks

4. Stockpiles of clay materials to be covered with impervious sheet

5. Roof water downpipes to be connected to the permanent underground stormwater system as soon as practical after roof is laid

Grassed Kerb to street - where possible make sure grass remains intact or replace as soon as possible

Temperary Sediment Control Fence to Street Boundary

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SEDIMENT CONTROL PLAN

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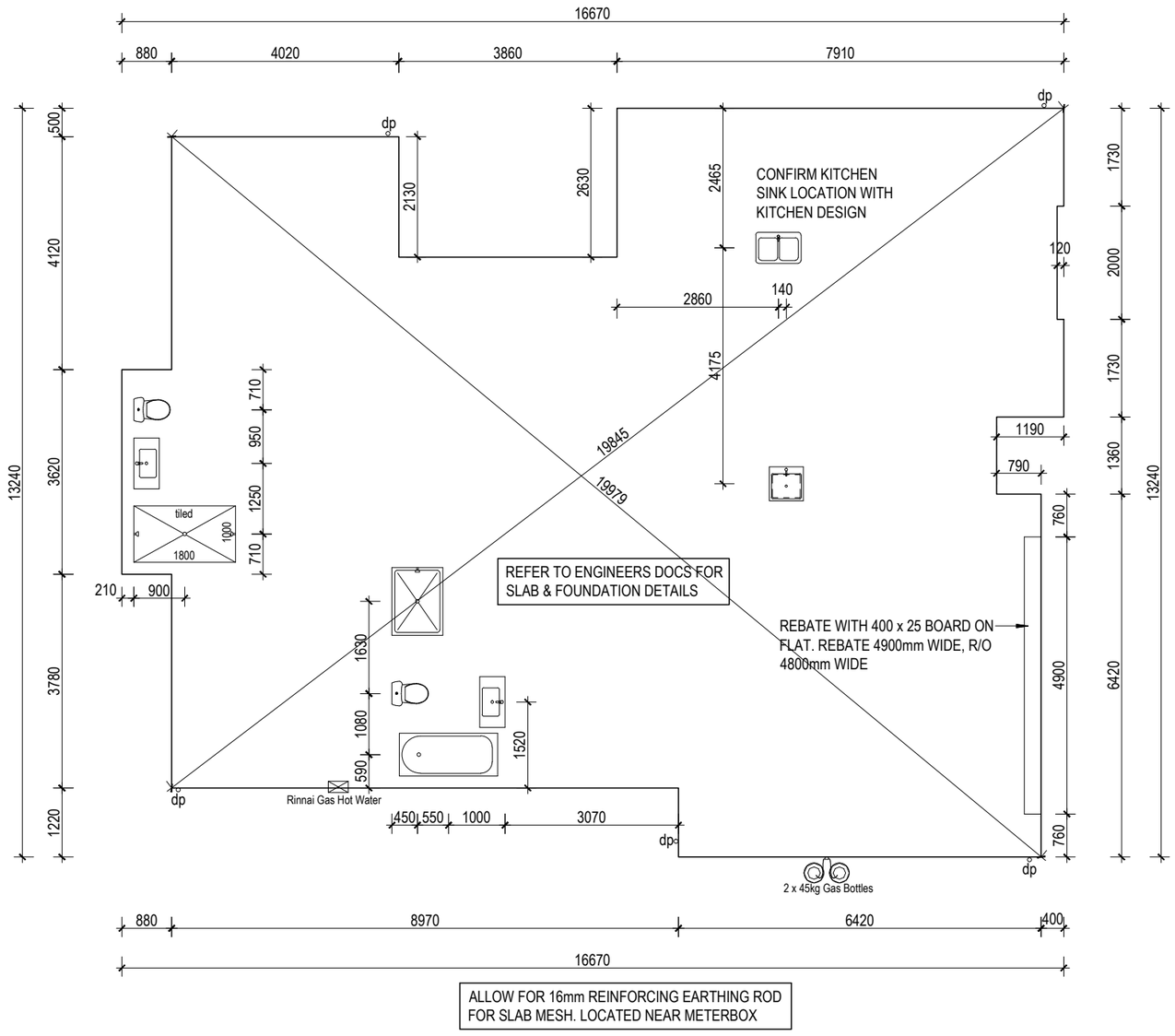

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BRACED WALLS - Extend top plate and or ceiling battens or bottom cord of truss to connect with external walls

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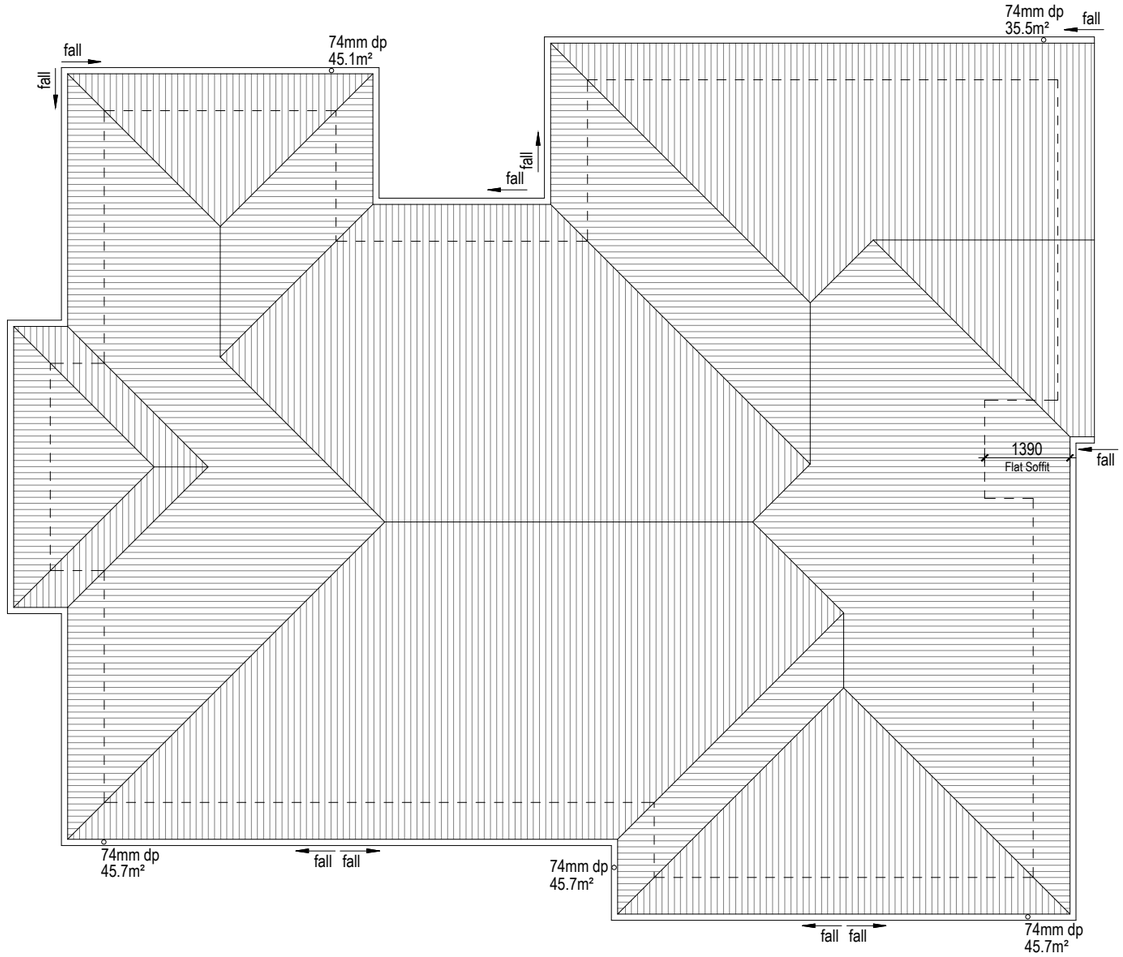

25° PITCH CORRUGATED COLORSTEEL ROOFING
600mm OVERHANG UNLESS OTHERWISE STATED

REFER TO TRUSS DESIGN DOCUMENTATION FOR ROOF PLANE BRACING DETAILS

USE DIAMOND QUAD WITH 6300mm² CROSS SECTIONAL AREA

USE 90 x 45 @ 900crs ON EDGE HORIZONTALLY SUPPORTING SOFFIT LININGS TO SOFFITS OVER 750mm WIDE

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Downlight

Batten Light

Smoke Alarm

Meter Board

Distribution Board

All downlights to be IC Rated throughout

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ELECTRICAL PLAN

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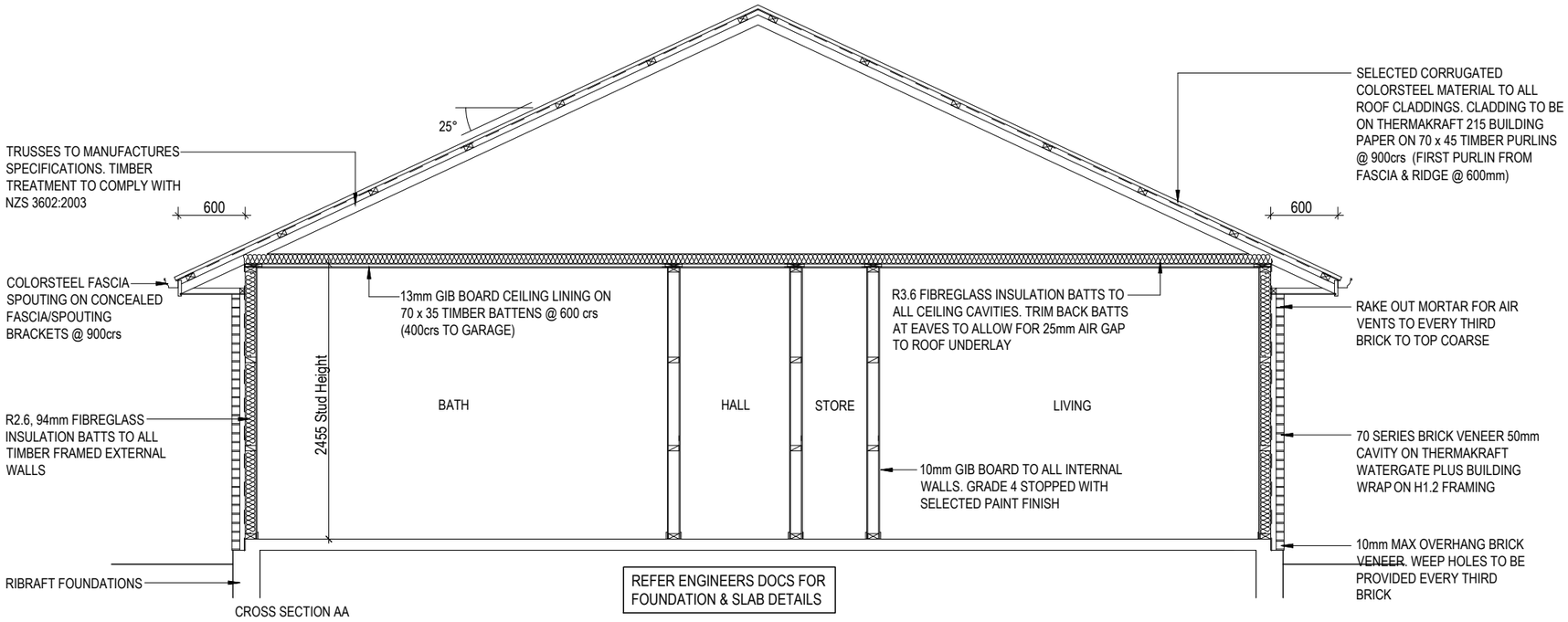

CROSS SECTION AA

SPECIFIC SCHEDULE OF TIMBER TREATMENT

ELEMENT	SPECIES	TREATMENT
ROOF FRAMING, TRUSSES	KILN DRIED & GAUGED RADIATA PINE	H1.2
INTERIOR WALL FRAMING	KILN DRIED & GAUGED PINUS SPECIES	H1.2
EXTERIOR WALL FRAMING (REFER TO NZS3602:2003 FOR CLARIFICATION)	RADIATA PINE	H1.2
WALL CAVITY BATTENS	RADIATA PINE	H3.1
ALUMINIUM WINDOW REVEALS	RADIATA PINE	H3.1

ELEMENT

- ALL TIMBER USED IS TO BE TREATED AS REQUIRED BY NZS3602:2003, THIS TABLE IS INTENDED AS A SUMMARY OF THESE REQUIREMENTS ONLY.

- TREATMENT LEVELS SHOWN ARE THE MINIMUM LEVEL REQUIRED. HIGHER TREATMENT LEVELS MAY BE USED IF APPROPRIATE.

TIMBER TYPE:
EXTERIOR & LOAD
BEARING FRAMING = SG 8
INTERIOR NON LOAD
BEARING FRAMING = SG 8
LINTELS = SG 8
TRUSSES = SG 8

TRIMMED INSULATION AREA (90mm rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33	2.1

STEEL PROTECTION FOR FIXINGS & FASTENINGS - ZONE B & C

FIXING FASTENING	ENVIRONMENT	MATERIAL
Nail Plates	Closed & Roof Space	Continuously coated galv steel
Wire Dogs & Bolts	Closed & Roof Space	Hot-dipped galv steel
All strutural fixings	Sheltered	Hot-dipped galv steel
	Exposed	Type 304 stainless steel
Nail/Screw for bracing		Galv steel
Nail/Screw for non-structural cladding		Galv steel
Nail/Screw for framing	Closed & Roof Space	Mild steel
	Sheltered	Galv steel
	Exposed	Galv steel

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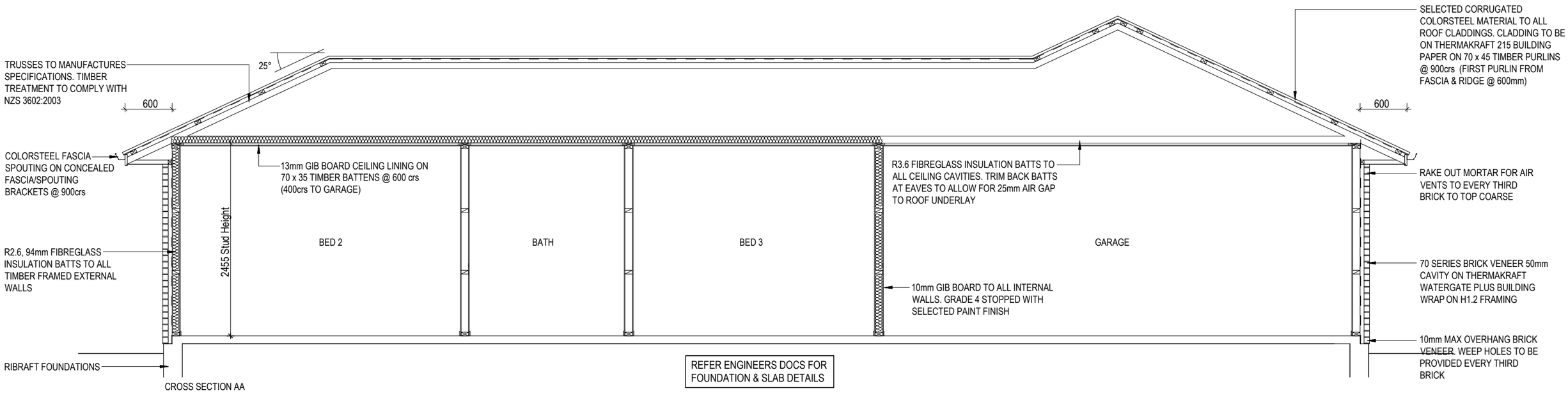

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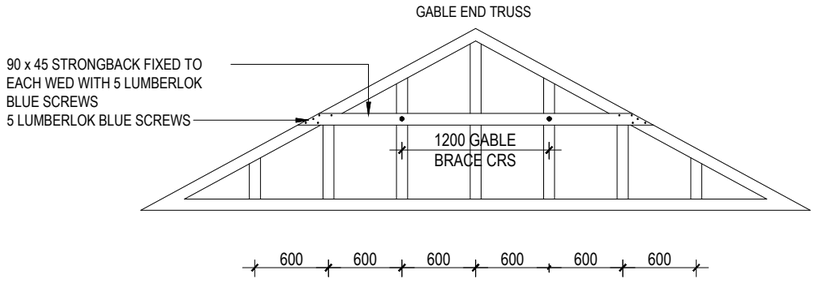

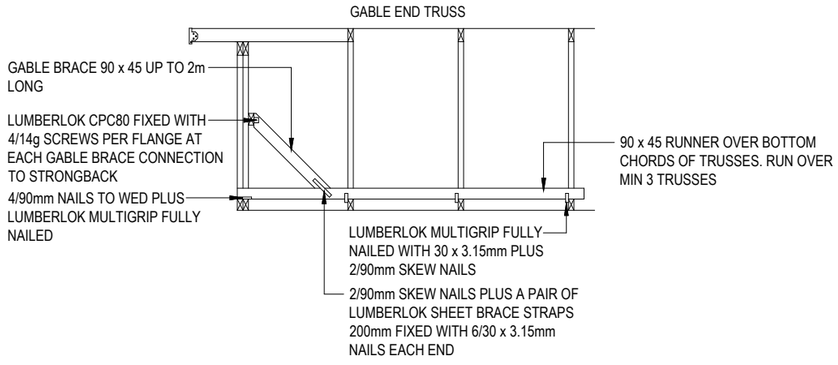

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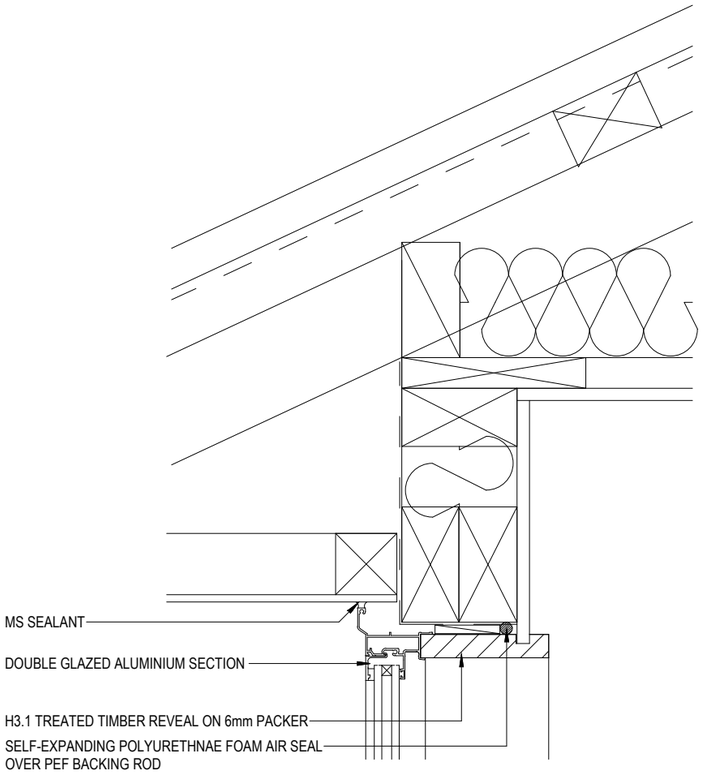
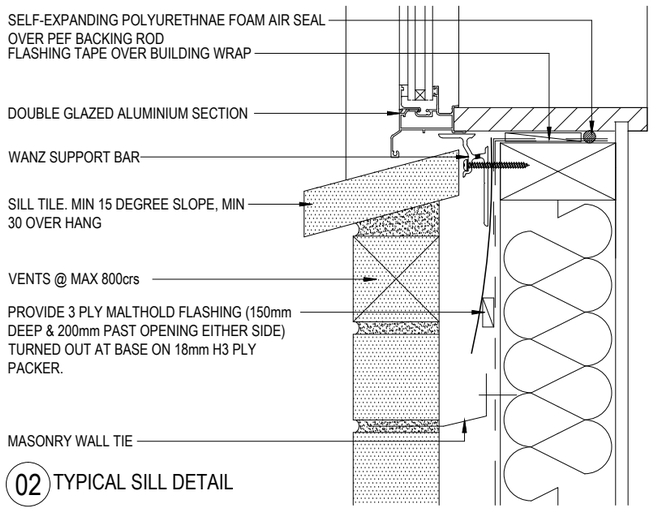
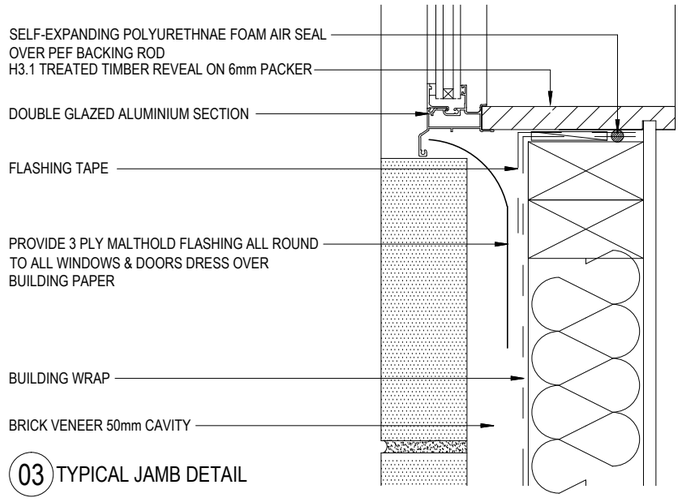


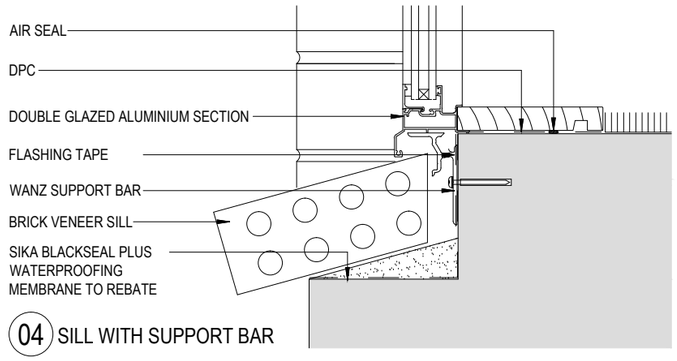
01 TYPICAL HEAD DETAIL



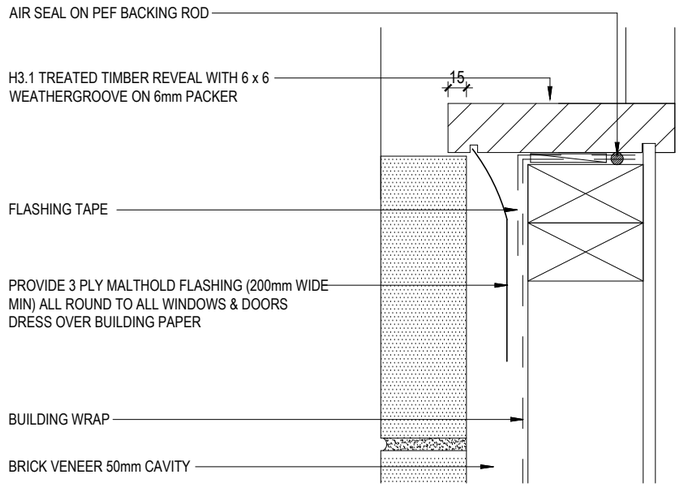
02 TYPICAL SILL DETAIL



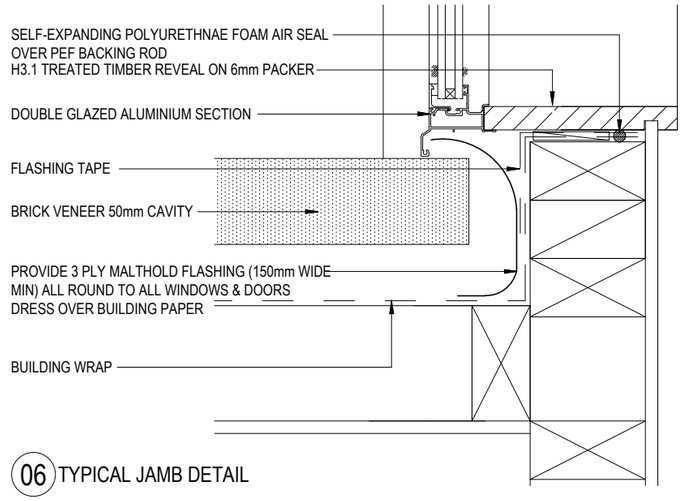
03 TYPICAL JAMB DETAIL



04 SILL WITH SUPPORT BAR



05 TYPICAL GARAGE DOOR JAMB



06 TYPICAL JAMB DETAIL

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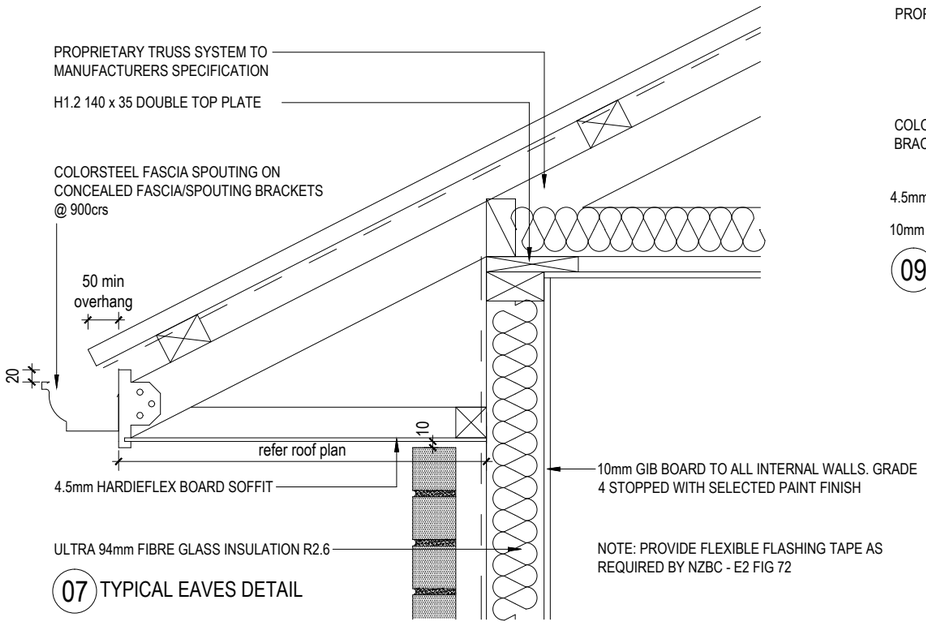
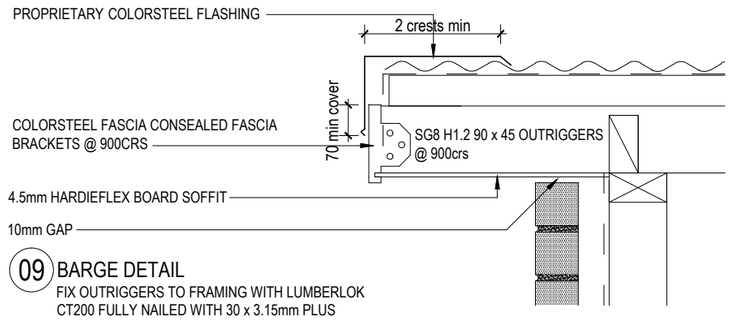
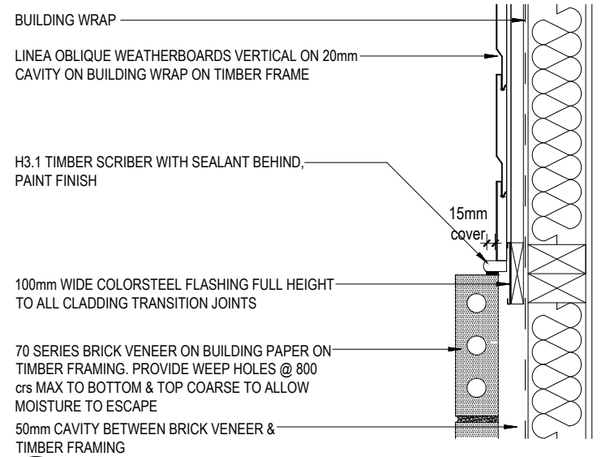


07 TYPICAL EAVES DETAIL

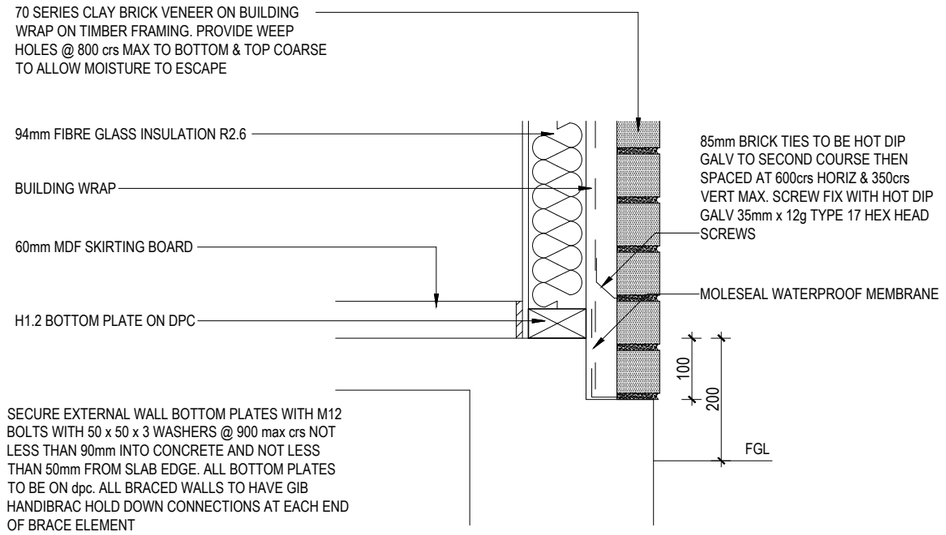


09 BARGE DETAIL

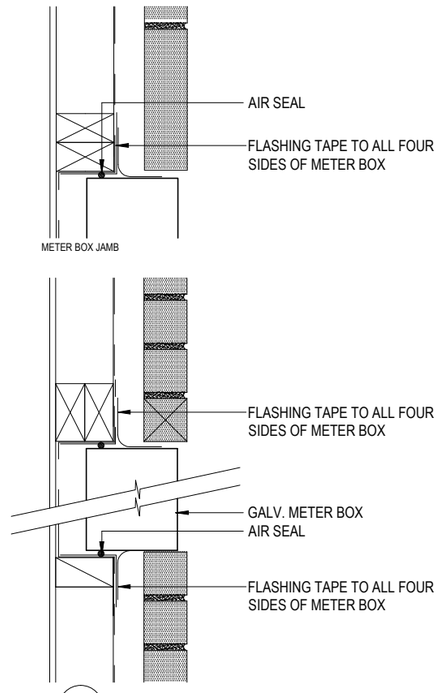
FIX OUTRIGGERS TO FRAMING WITH LUMBERLOK CT200 FULLY NAILED WITH 30 x 3.15mm PLUS 2/90mm SKEW DRIVEN NAILS



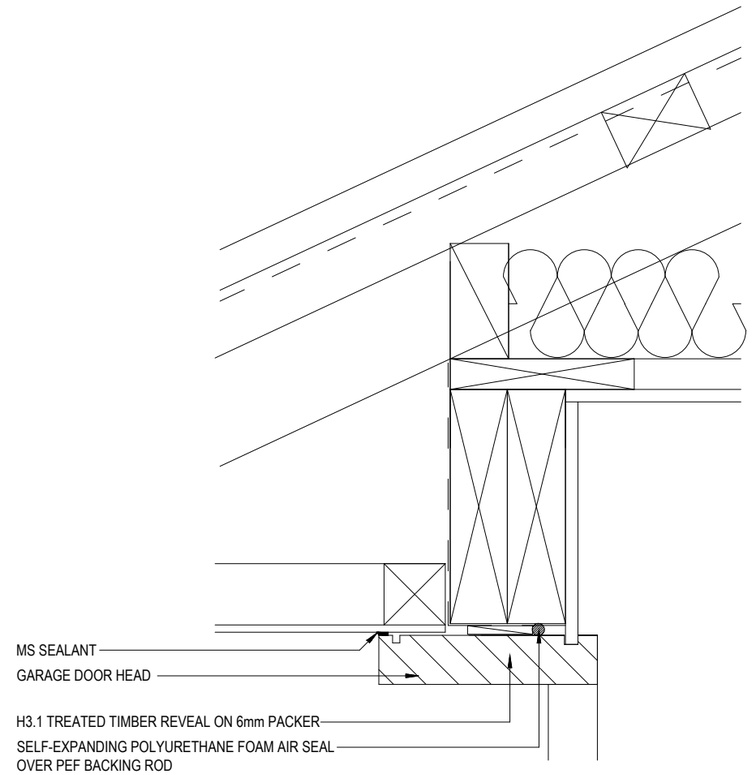
11 WB TO BRICK VENEER CLADDING TRANSITION DETAIL



08 FOUNDATION DETAIL



10 BRICK / METER BOX DETAIL



12 GARAGE HEAD DETAIL

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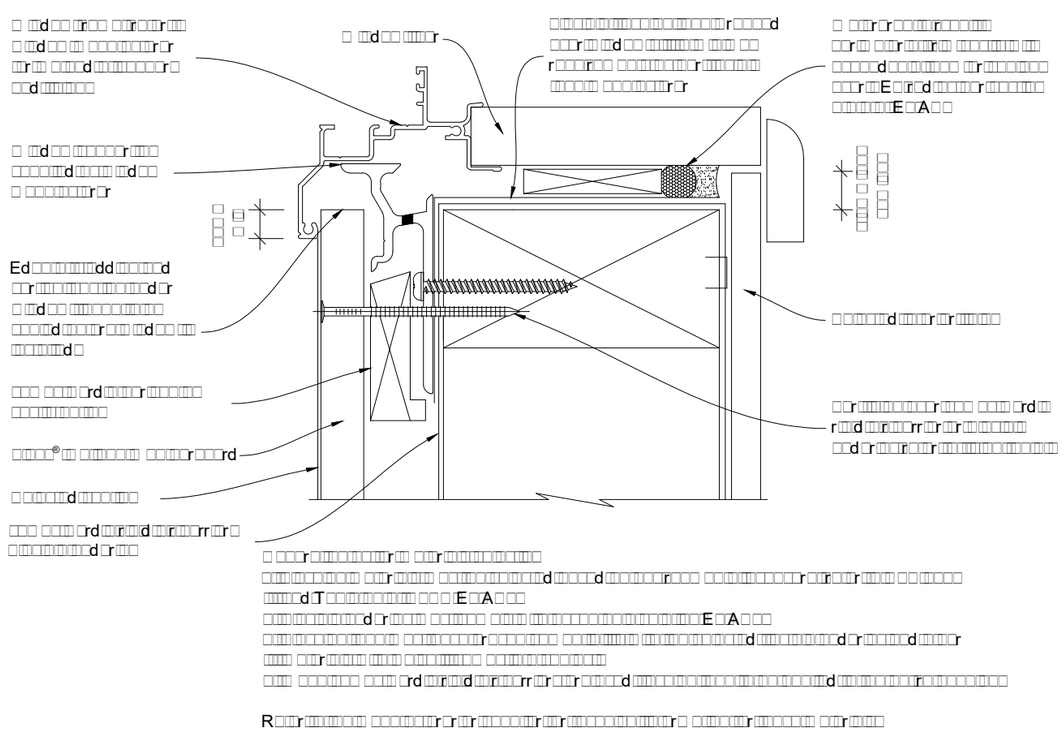
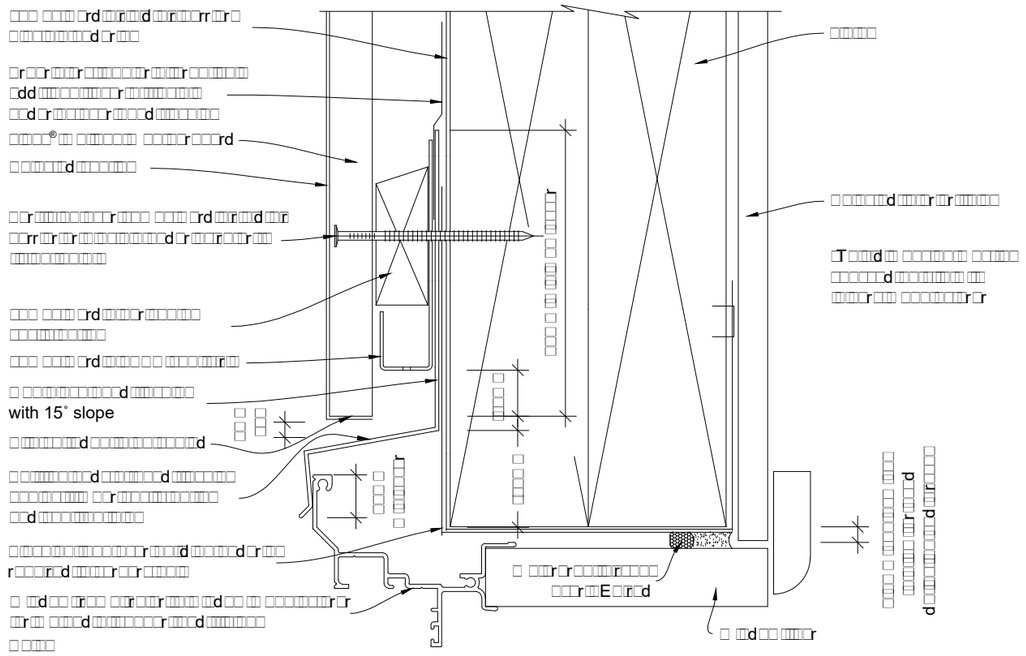


13 □ □□d□□ □□□ □□□□



14 □ □□d□□ □□□ □□d

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Job No.:
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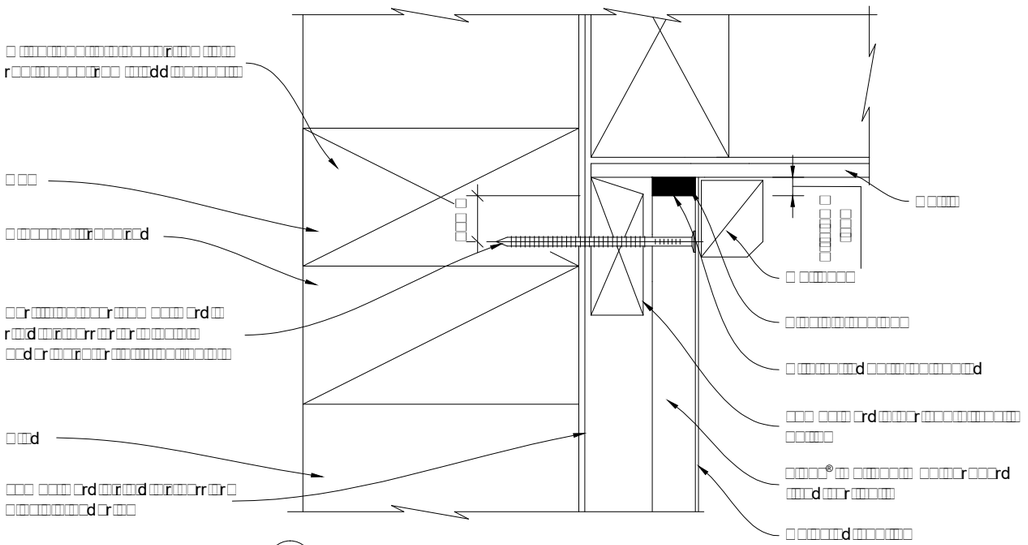
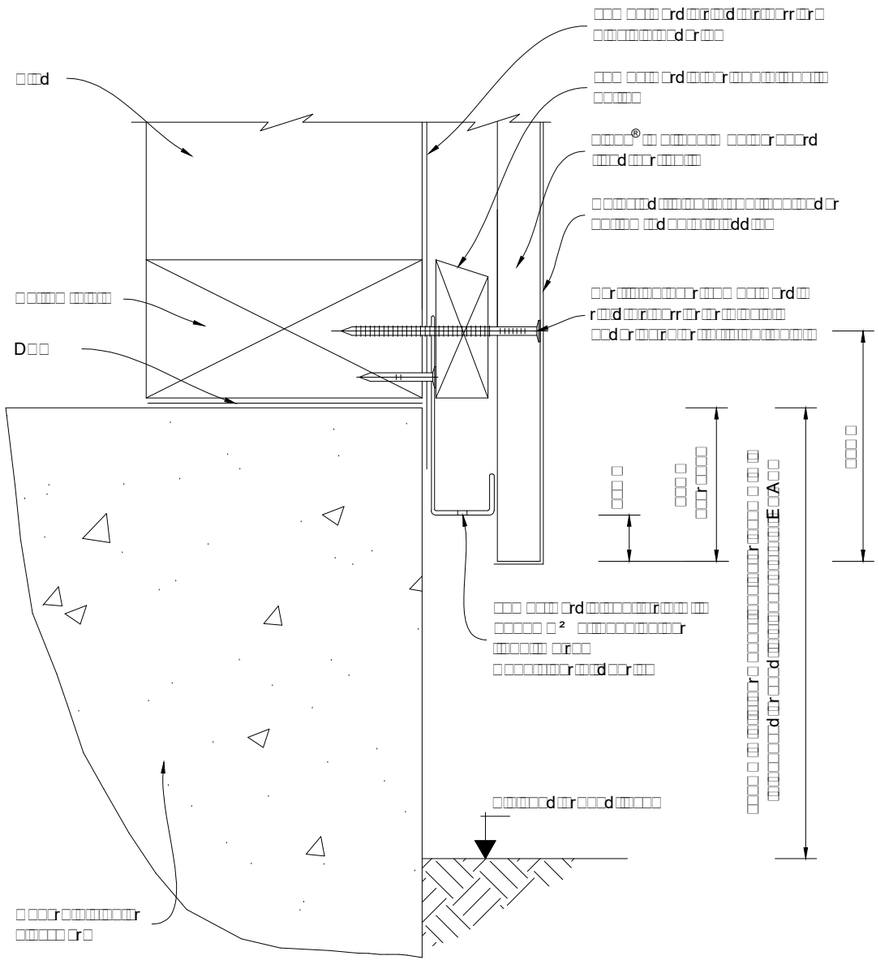
page:
16
of: 22

DATE: 30/09/2020



15 □□□□□D □□□□□



16 □□□□d □□□□□D □□□□□

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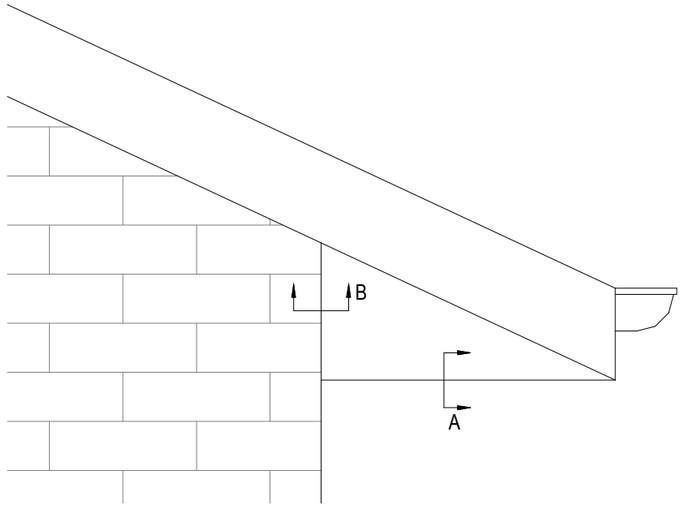
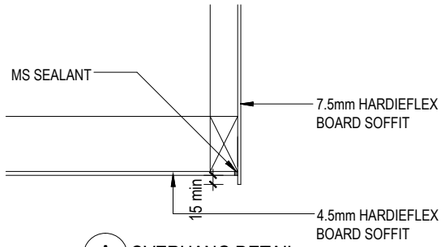
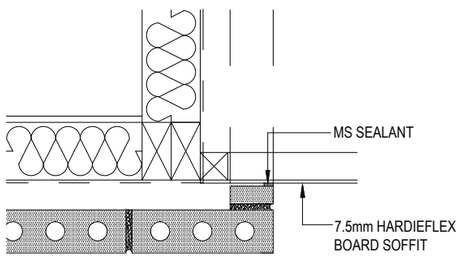


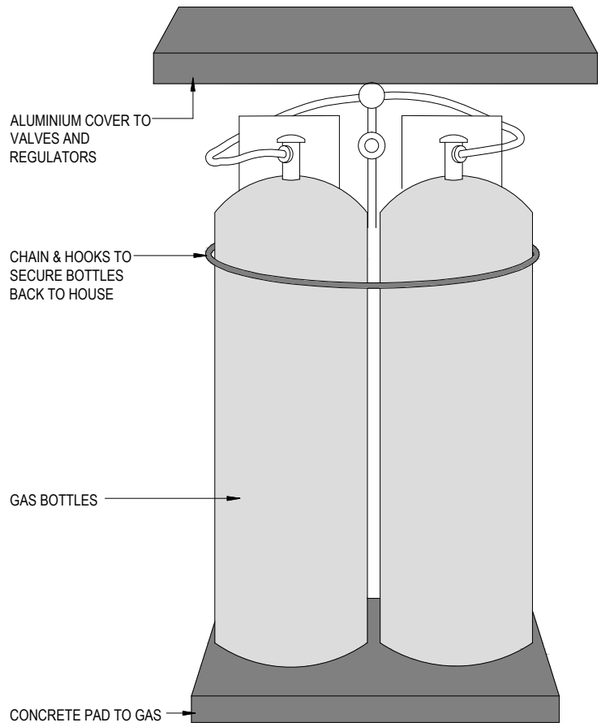
17 EAVES DETAIL



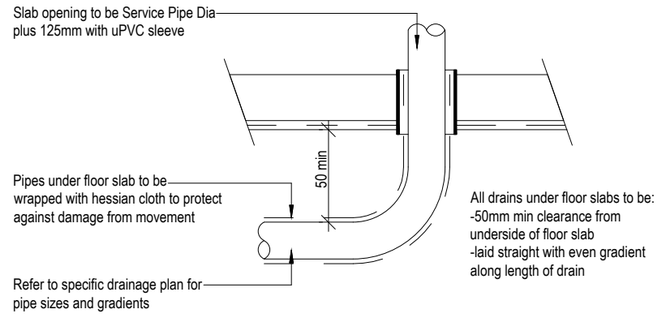
A OVERHANG DETAIL



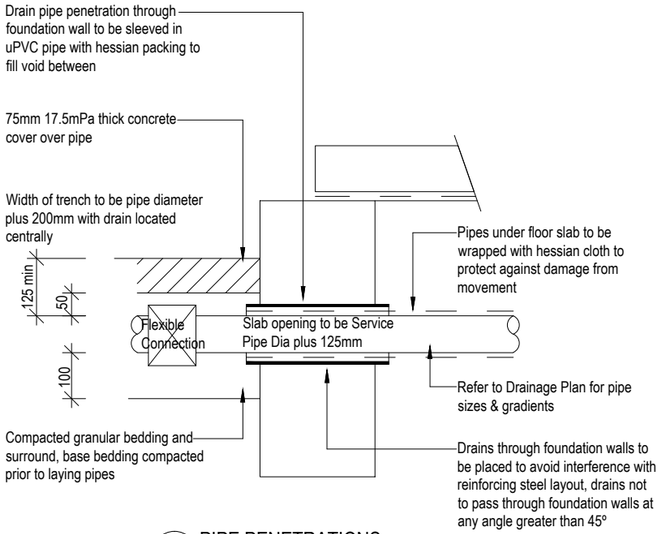
B SOFFIT DETAIL



18 GAS BOTTLES STATION



19 PIPE THROUGH FLOOR
SLAB PENETRATIONS



20 PIPE PENETRATIONS
THROUGH FOUNDATION WALLS

DETAIL APPLICABLE TO PIPES WITH A
MINIMUM COVER OF 125mm UP TO A
MAXIMUM OF 375mm

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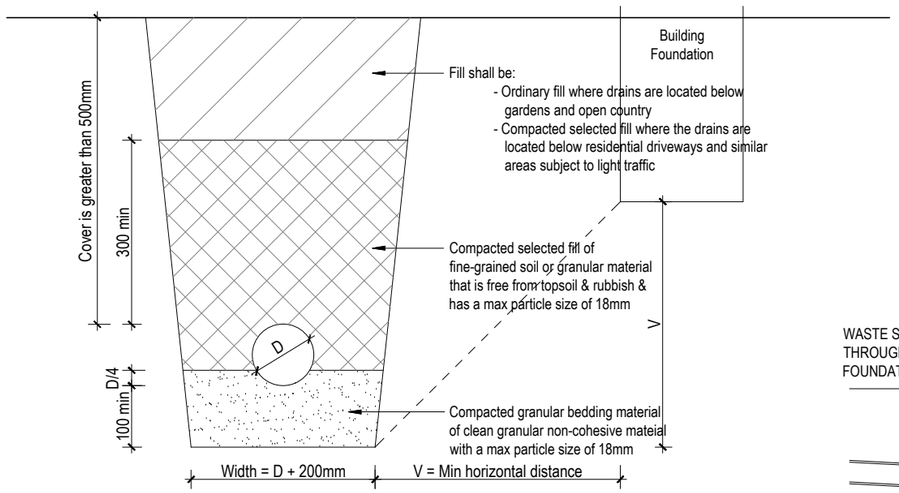
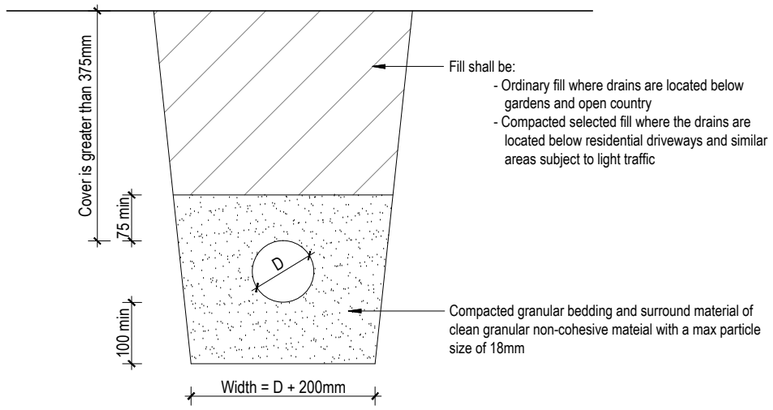
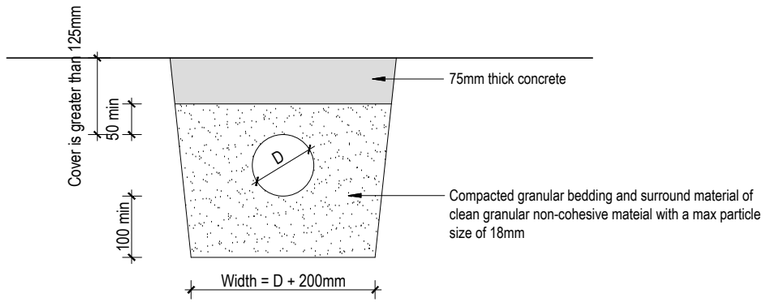


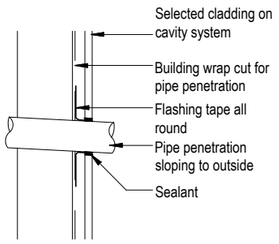
21 BEDDING TYPE 'B' OF NZS7643
Cover greater than 500mm



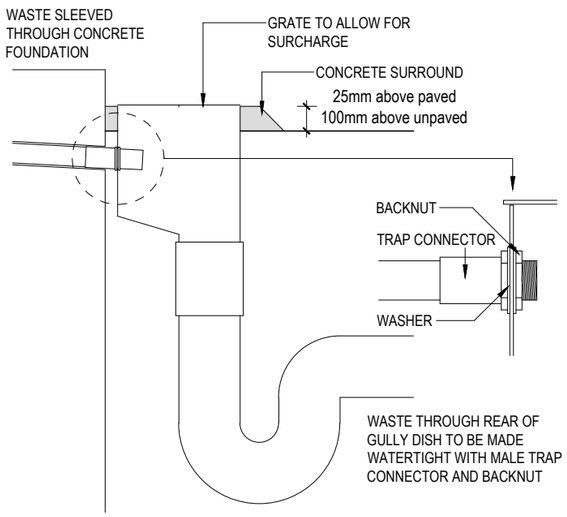
22 BEDDING TYPE 'D' OF NZS7643
Cover greater than 375mm



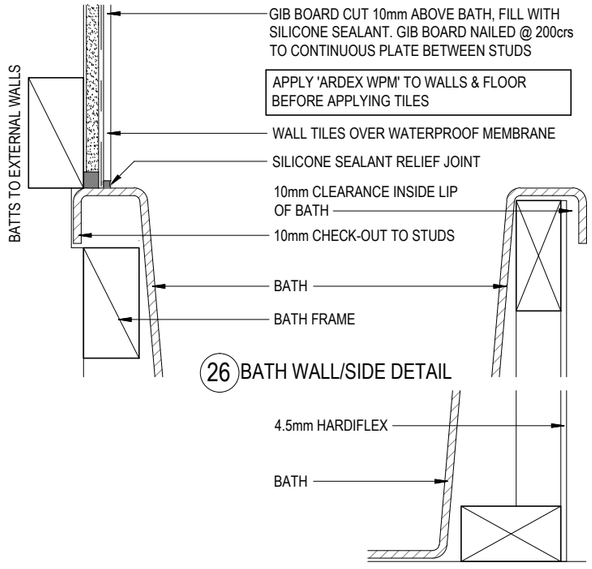
23 COVER BETWEEN 125 & 375mm



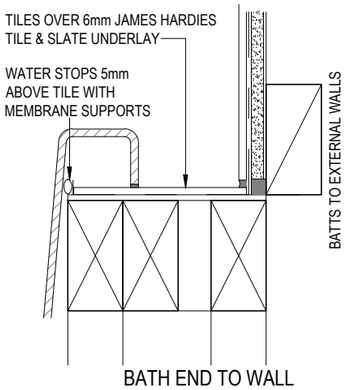
24 GENERAL PIPE PENETRATION



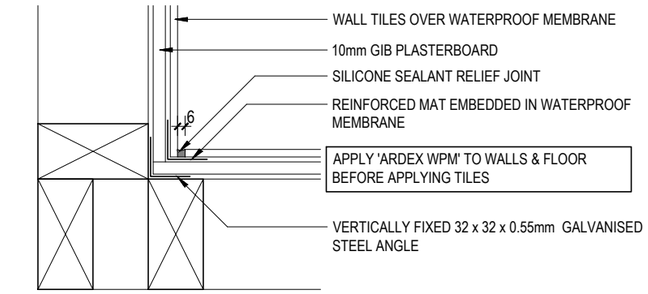
25 WASTE DISCHARGING TO REAR OF GT



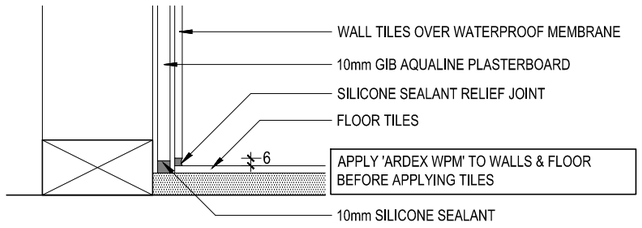
26 BATH WALL/SIDE DETAIL



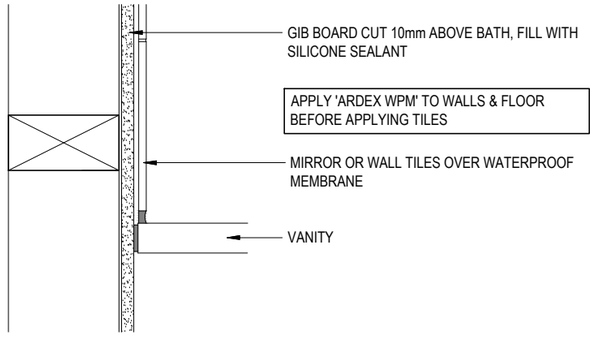
BATH END TO WALL



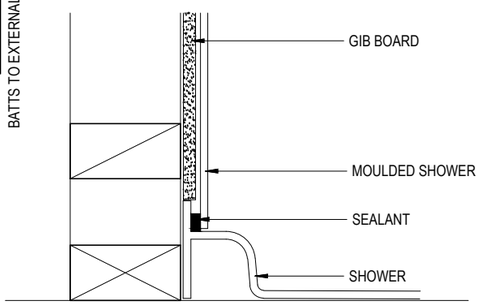
27 TILED - INTERNAL CORNER



28 TILED - WALL TO FLOOR JUNCTION



29 VANITY TO WET WALL DETAIL



30 WALL TO SHOWER JUNCTION

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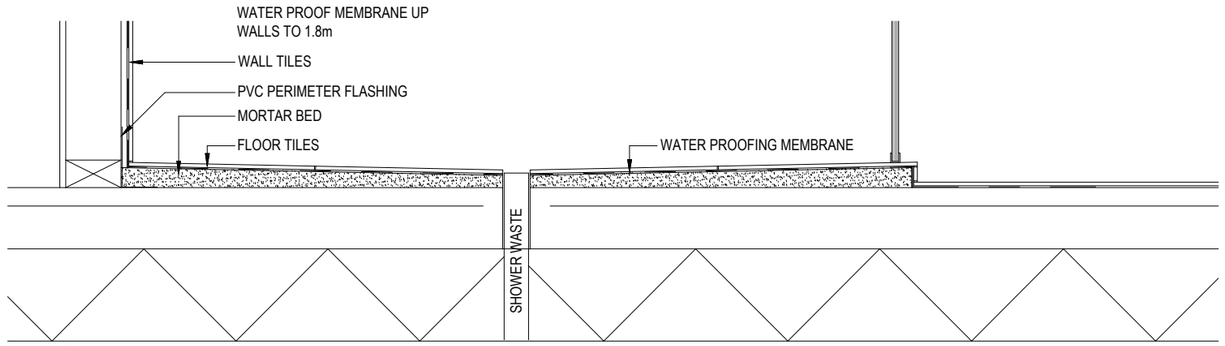
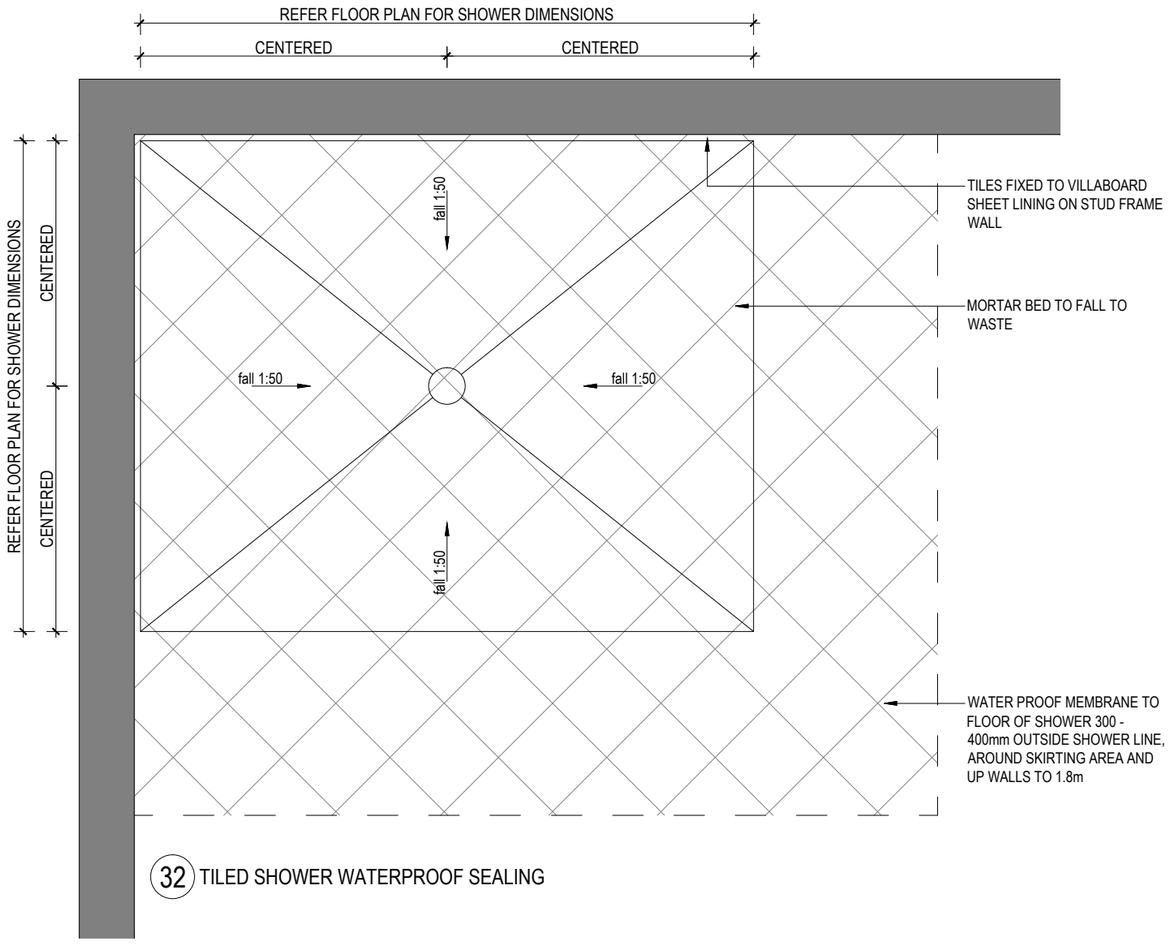
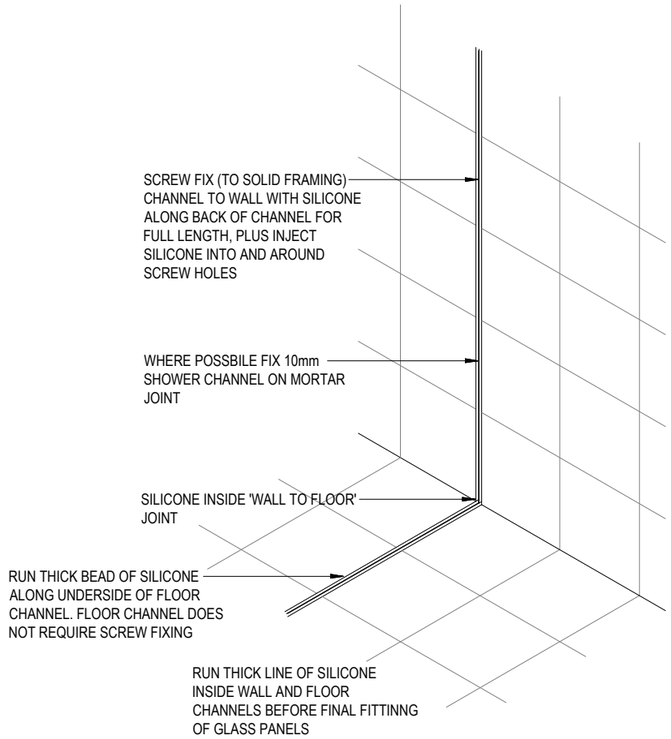


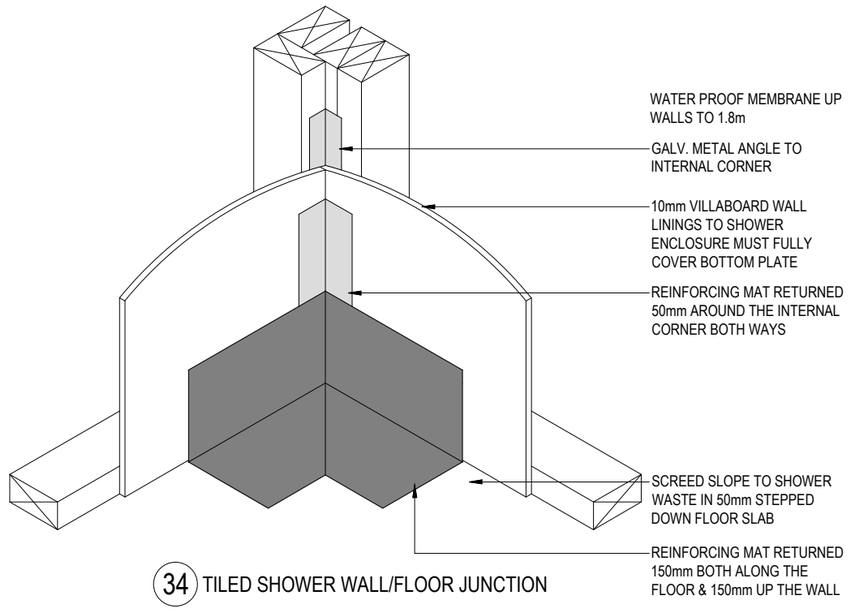
31 TILED SHOWER REBATE



32 TILED SHOWER WATERPROOF SEALING



33 GLASS SHOWER DETAIL



34 TILED SHOWER WALL/FLOOR JUNCTION

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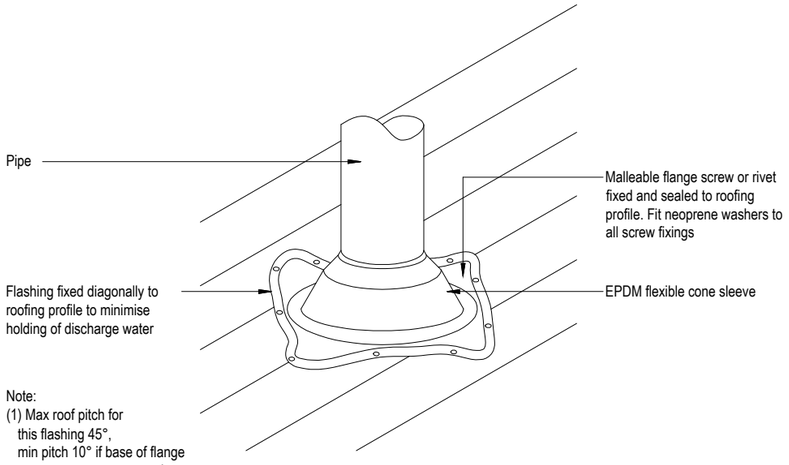
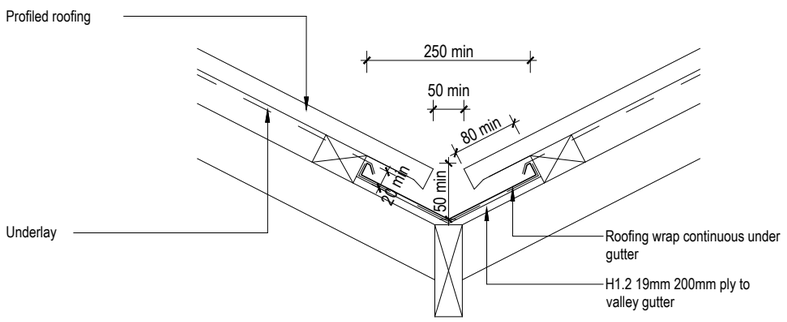
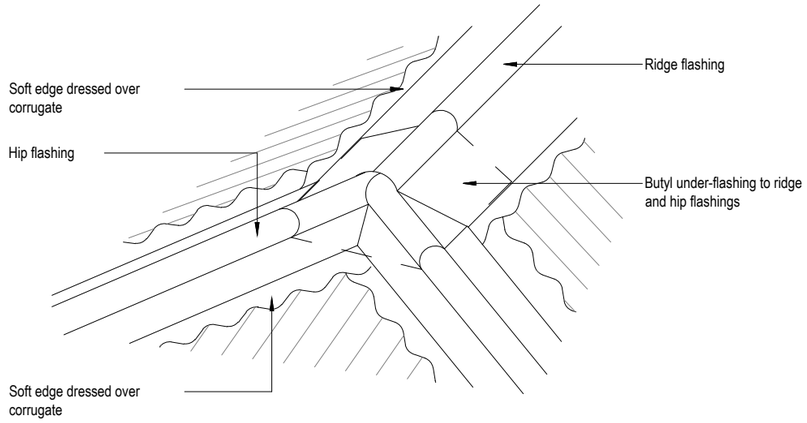


Note:
(1) Max roof pitch for this flashing 45°, min pitch 10° if base of flange covers one or more complete troughs
(2) For pipes up to 85mm dia

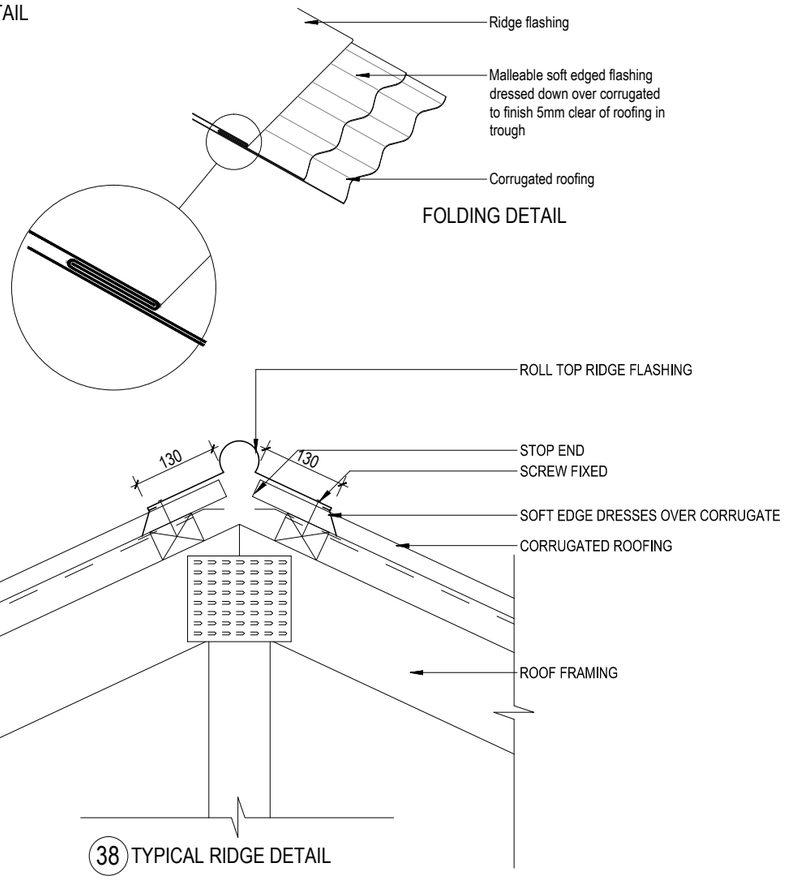
35 PENETRATION DETAIL



36 VALLEY DETAIL



37 HIP DETAIL



38 TYPICAL RIDGE DETAIL

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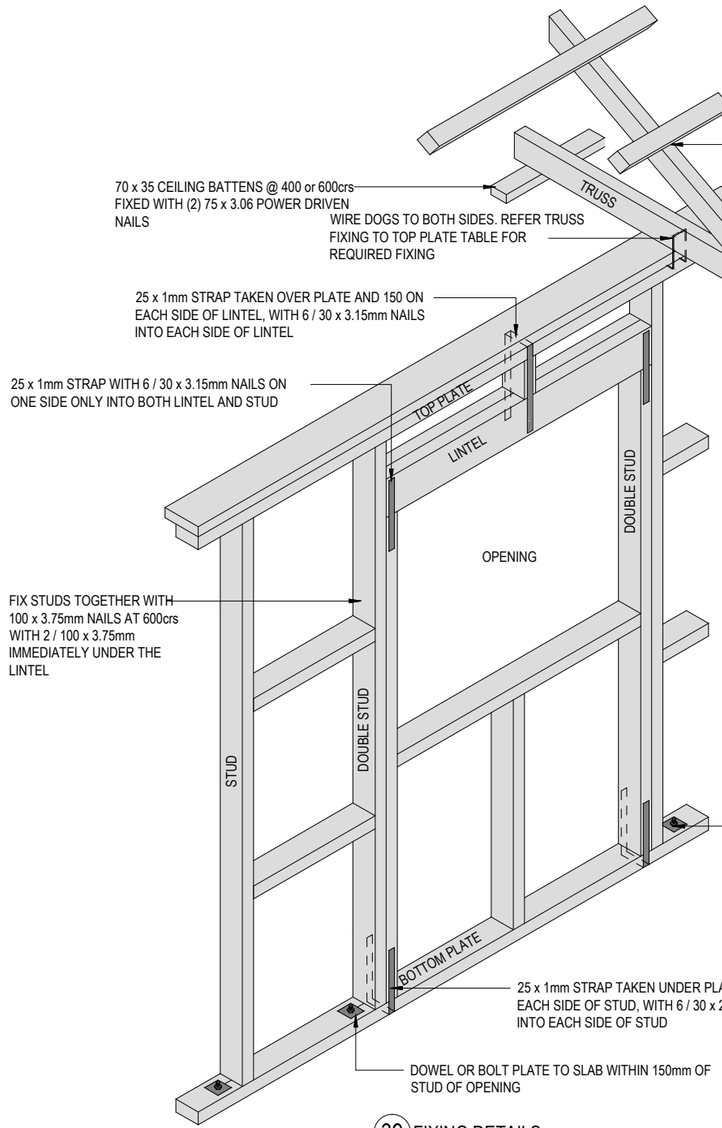


70 x 35 CEILING BATTENS @ 400 or 600crs FIXED WITH (2) 75 x 3.06 POWER DRIVEN NAILS

WIRE DOGS TO BOTH SIDES. REFER TRUSS FIXING TO TOP PLATE TABLE FOR REQUIRED FIXING

25 x 1mm STRAP TAKEN OVER PLATE AND 150 ON EACH SIDE OF LINTEL, WITH 6 / 30 x 3.15mm NAILS INTO EACH SIDE OF LINTEL

25 x 1mm STRAP WITH 6 / 30 x 3.15mm NAILS ON ONE SIDE ONLY INTO BOTH LINTEL AND STUD

FIX STUDS TOGETHER WITH 100 x 3.75mm NAILS AT 600crs WITH 2 / 100 x 3.75mm IMMEDIATELY UNDER THE LINTEL

SECURE EXTERNAL WALL BOTTOM PLATES WITH M12 BOLTS WITH 50 x 50 x 3 WASHERS @ 900 max crs NOT LESS THAN 75mm INTO CONCRETE AND NOT LESS THAN 50mm FROM SLAB EDGE. ALL EXTERNAL BOTTOM PLATES TO BE ON dpc. ALL BRACED WALLS TO HAVE M12 BOLTS AT EACH END OF BRACE

25 x 1mm STRAP TAKEN UNDER PLATE AND 150 UP EACH SIDE OF STUD, WITH 6 / 30 x 2.5mm NAILS INTO EACH SIDE OF STUD

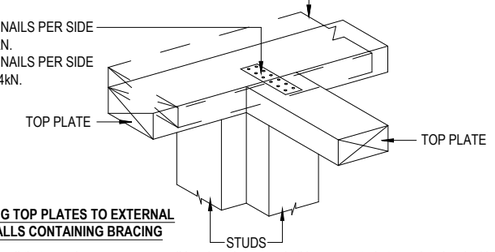
DOWEL OR BOLT PLATE TO SLAB WITHIN 150mm OF STUD OF OPENING

PURLIN FIXING
Light Roof
Truss Spacing = 900mm
Wind Zone = High

70 x 45 PURLINS @ 900mm SPAN MAX & SPACED @ 900mm MAX (FIRST PURLIN FROM FASCIA & RIDGE @ 600mm). 1 / 10g LUMBERLOK BLUE SCREW 80mm. LONGLUMBERLOK TYPE C FIXING 2.50kN. FIXING PATTERN C1 - HIT 1, MISS 1....

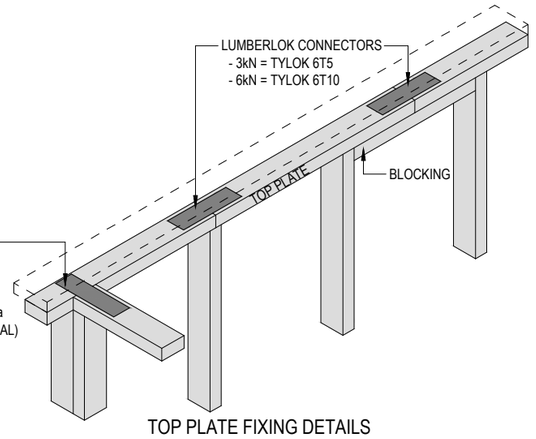
140 x 35 ADDITIONAL TOP PLATE WHEN REQUIRED

6/30 x 3.15mm NAILS PER SIDE ACHIEVING 6kN.
3/30 x 3.15mm NAILS PER SIDE ACHIEVING 2.4kN.



CONNECTING TOP PLATES TO EXTERNAL WALLS - WALLS CONTAINING BRACING

NOTE: Each wall that contains one or more wall bracing elements shall be connected at top plate level, either directly, or through fraimg memeber in the line of the wall, to external walls at right angles to it. Top plate fixinf of the capacity in tension or compression along the line of the wall bracing element are given as below.
(a) For each wall containg bracing elements with a total of not more than 250 BUs, the fixing capacity shall be 6 kN.
(b) For each wall containing bracing elements with a total of more that 250 BUs, the fixing capacity shall be 2.4kN.
Refer to NZS 3604:2011 clause 8.7.3.4



LUMBERLOK CONNECTORS
- 6kN = TYLOK 6T10
- 12kN = 2 x SHEET BRACE STRAPS FIXED WITH 6 x LUMBERLOK PRODUCT NAILS 30mm x 3.15dia PER END STRAP (24 NAILS TOTAL)

TOP PLATE FIXING DETAILS

39 FIXING DETAILS

TOP PLATE FIXING TO STUD
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Wall	Fixing Type
2.0	2 / 90 x 3.15 end nails + 2 wire dog
3.0	2 / 90 x 3.15 end nails + 2 wire dog
4.0	2 / 90 x 3.15 end nails + 2 wire dog
5.0	2 / 90 x 3.15 end nails + 2 wire dog
6.0	2 / 90 x 3.15 end nails + 2 wire dog

TRUSS FIXING TO TOP PLATE
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Support	Fixing Type
3.0	2 / 90 x 3.15 skewed nails + 2 wire dog
3.5	2 / 90 x 3.15 skewed nails + 2 wire dog
4.0	2 / 90 x 3.15 skewed nails + 2 wire dog
4.5	2 / 90 x 3.15 skewed nails + 2 wire dog
5.0	2 / 90 x 3.15 skewed nails + 2 wire dog
5.5	2 / 90 x 3.15 skewed nails + strap fixing
6.0	2 / 90 x 3.15 skewed nails + strap fixing

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scale: 1:10

Job No.: -

DATE: 30/09/2020

GENERAL

1. These drawings are not to be used for construction until the plan (sheet S2) is signed by the main contractor

2. Do not scale. refer any discrepancies to the architect/engineer.

3. These drawings are to be read in conjunction with the Architects & Engineers drawings.

4. The builder shall be responsible for any damage to works during construction.

5. The sand blinding layer shall be 20mm min. & 50mm max. to aid levelling & to prevent rocking of pods.

6. Vapour barrier to be 0.25mm (250 micron) polythene complying with NZS 4229. / NZS 3604

7. Finished ground level adjacent to slab to be protected from wind, water erosion and undermining.

FOUNDATIONS

1. For assumed allowable bearing capacity refer to calculations/installer guide. Unless otherwise noted in documentation

2. If there is any doubt about the integrity of the material on which the slab is to be founded - an Engco representative must be notified immediately.

CONCRETE

1. All workmanship & materials to conform to NZS 3109, NZS 4210 & local authority regulations.

2. Minimum covers to reinforcement:

- Exposed to earth - 75mm.
- Protected by vapour barrier - 50mm.
- Not exposed to weather except for a brief period during construction - 25mm.

3. No holes or chases other than those specified are to be made in the slab without the approval of the Engineer.

4. All concrete shall be 20 MPa FIRTH Raftmix grade with 20mm nominal maximum aggregate size & 120mm slump & shall comply with NZS 3109.

5. All concrete to be mechanically vibrated & carefully worked around the reinforcement & into the corners of the formwork.

INSPECTIONS

Inform ENGCO consulting 48 hours in advance of any inspections required for code compliance certification.
Contact ENGCO - Ph. 03 366 7955 & quote ENGCO Ref. No.

INSPECTIONS REQUIRED

1. Site Strip - Bearing Capacity Confirmation.

2. Pre-pour of slab

STEEL

1. All reinforcing shall be new Zealand sourced and conform to AS/NZS 4671 :2001 in grade 300 or grade 500E.

2. All bends to be made cold without fracture.

3. All reinforcing shall be deformed type unless otherwise stated.

4. Grade 500E deformed bars shall be designated 'H', Grade 300 deformed bars shall be designated 'D' and Grade 300 round bars shall be designated 'R'

5. Minimum bar splice 720mm. (or unless otherwide noted)

6. All reinforcement to be fixed & tied where necessary in its specified position.

7. Welding of steel is not permitted

8. Spacers:

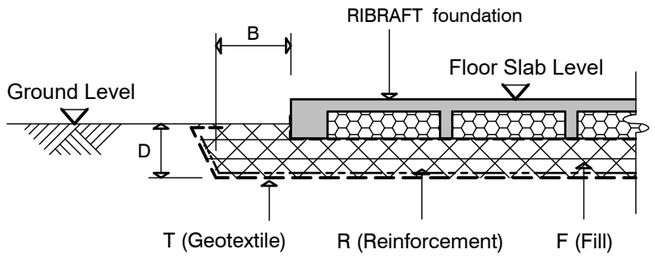
- Edge at 1200mm ctrs (one on edge & two on corners, typically).
- Internal one on each side of pod (typically).
- 50mm mesh chairs to be used

9. All mesh shall comply with AS/NZS 4671 & shall conform with elongation requirements exceeding 10%.

10. All Mesh shall lap a minimum of 250 m.m.
(ensure end extensions are not included in lap length)

GEOTECHNICAL REFERENCE:

Refer: Aurecon
Ref. 235361
Dated: 21st August 2020



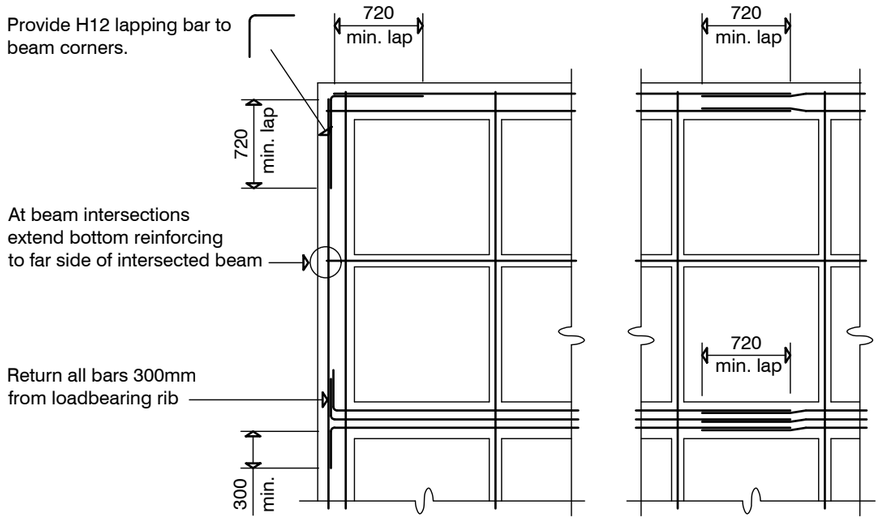
BUILDING PLATFORM

N.T.S.

BUILDING PLATFORM TABLE:	
B	300mm
D	Strip turfed top soil to 150mm approx. depth - confirm soil condition before backfilling
T	Not Required
R	Not Required
F	AP40 or AP65 fill. - 95% Dry Density. Compact in 200mm layers (max.) Fill as required to suit FFL, allow for 20mm coarse sand blinding min.

Refer to Architects drawings for finished floor level

Provide H12 lapping bar to beam corners.



TYPICAL CORNER STEEL & MIN. LAPPING REQUIREMENTS

N.T.S.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

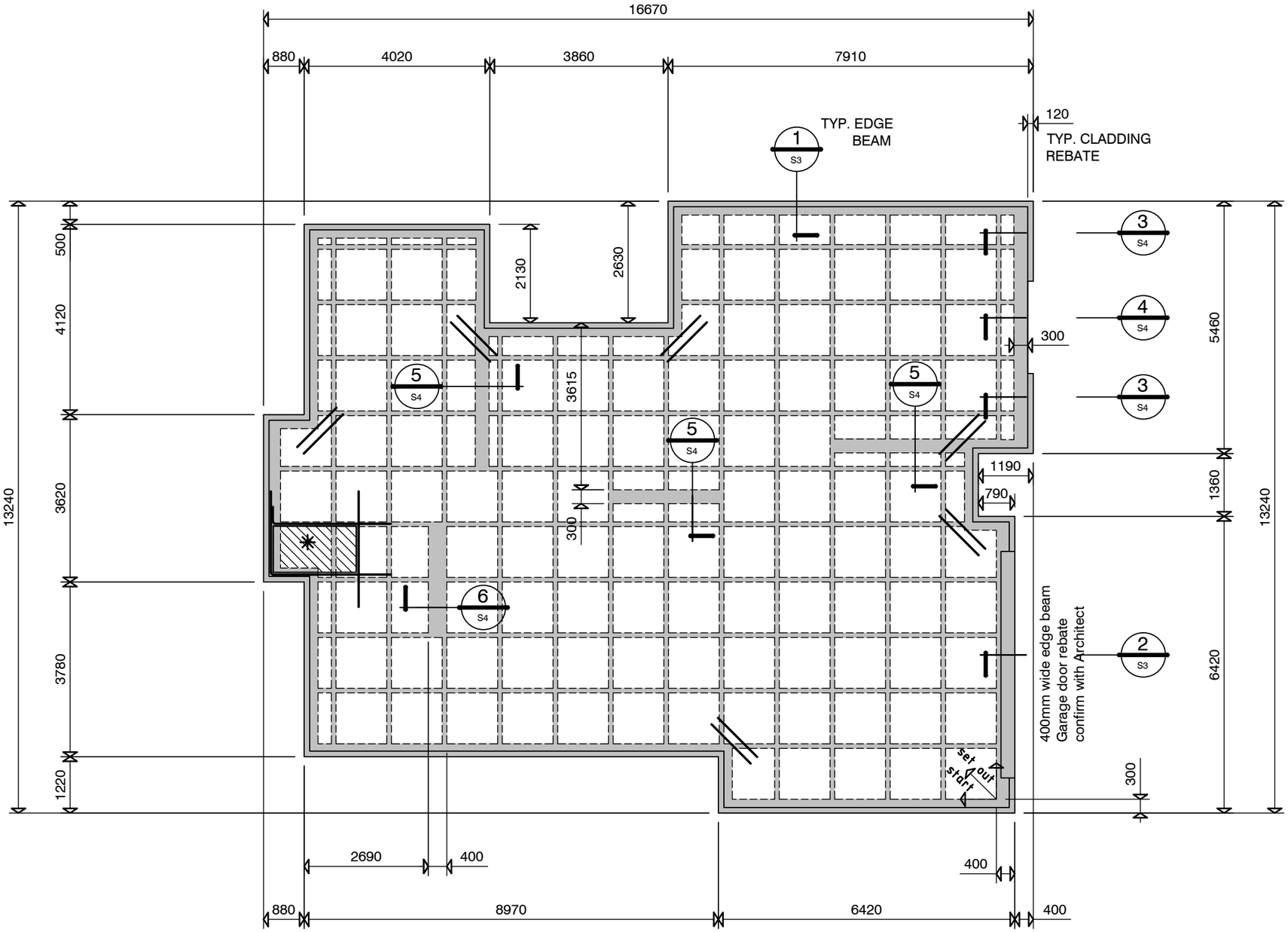
BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

GENERAL NOTES

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
dwg S1
rev.

contractor shall verify all dimensions before commencing work



GENERAL NOTES:

Locations shown of internal floor beam thickenings are indicative only. It shall be the responsibility of the Contractor to ensure that they are located centrally under the load bearing walls to which they pertain.

Under no circumstance should pipework for services be run longitudinally in 100mm ribs. Similarly they should not be run along perimeter foundations nor internal floor beam thickenings

Vertical or horizontal penetrations through the foundation edge beam or floor beam thickenings must be made through the middle third of the member - refer Firth Ribraft Technical Solutions manual for specific information. Vertical penetrations should not be made through 100 mm ribs.

KEY:

(2) H12 (x1200) at 200 centres.

85 m.m. Floor Slab - 220mm pods
(20 MPa FIRTH Raftmix)
G500 E SE62 Ductile mesh.

All Mesh shall lap a minimum of 250 m.m.
(End extensions not included).

✳ 50mm shower rebate, maintain min. slab thickness
Trim perimeter with H12. extending 750mm past (typ.) (or 300mm return)
Refer to Architects drawings for setout dimensions

RIBRAFT FOUNDATION LAYOUT PLAN

1:100

Confirm all dimensions with Architectural Drawings.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

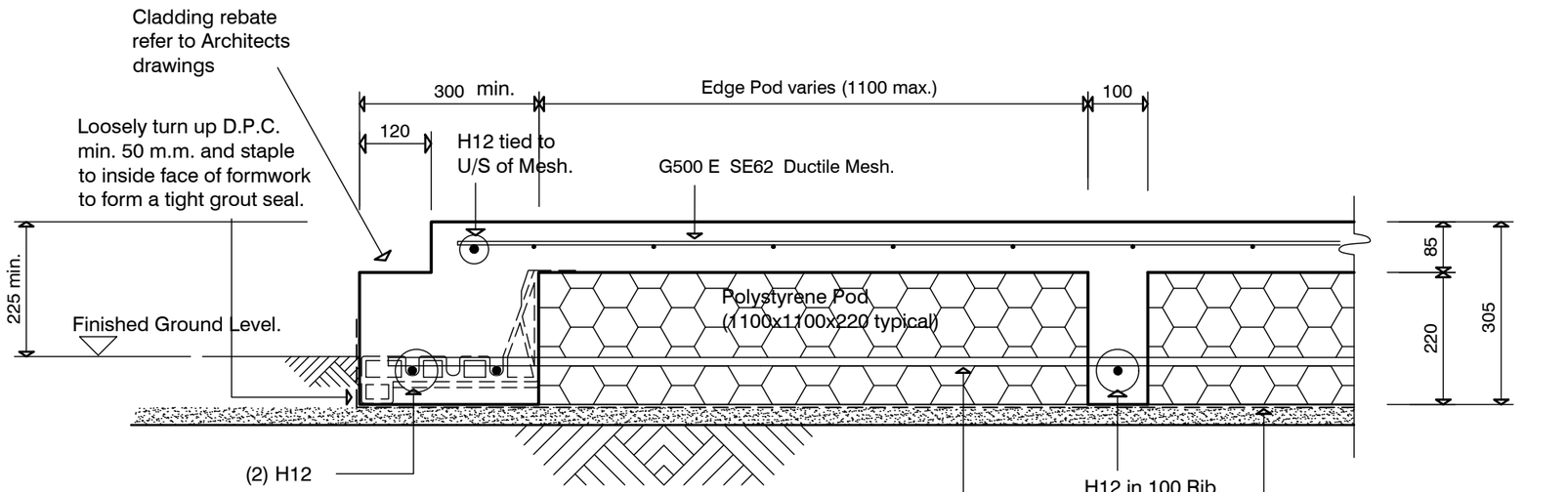
RIBRAFT LAYOUT
FOUNDATION PLAN

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26

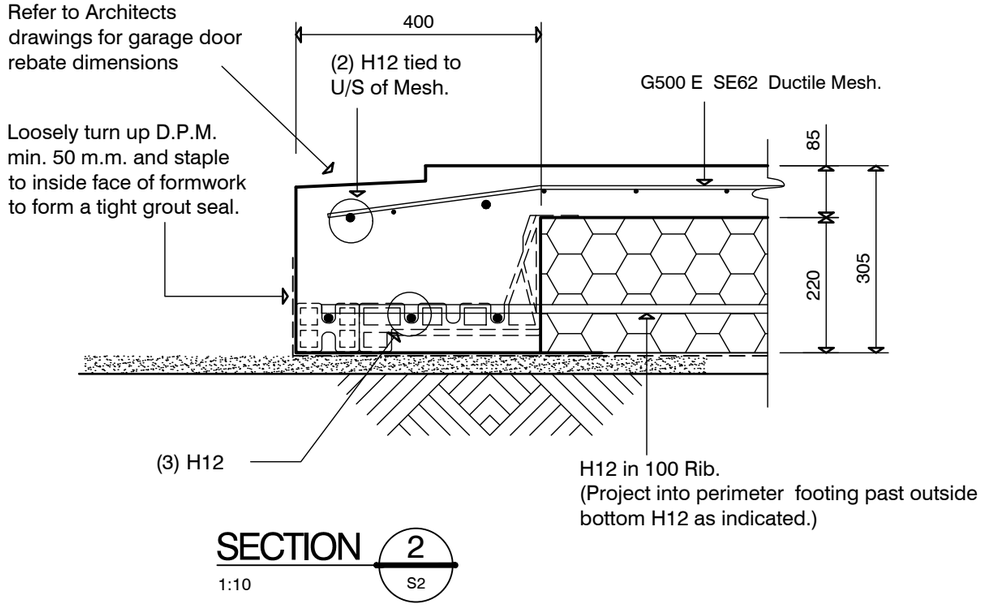
dwg S2

rev.

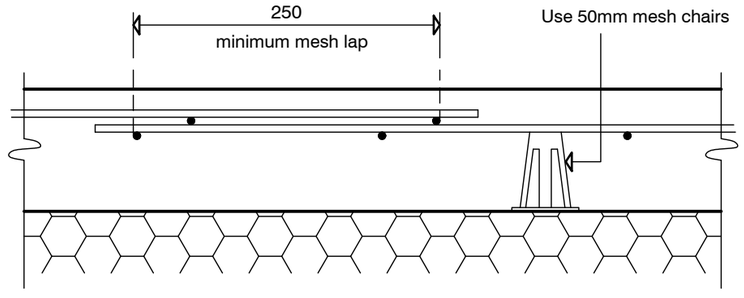


SECTION 1 / S2
1:10

TYPICAL PERIMETER BEAM



SECTION 2 / S2
1:10



TYPICAL MESH LAP & CHAIR REQUIREMENTS
1:5

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

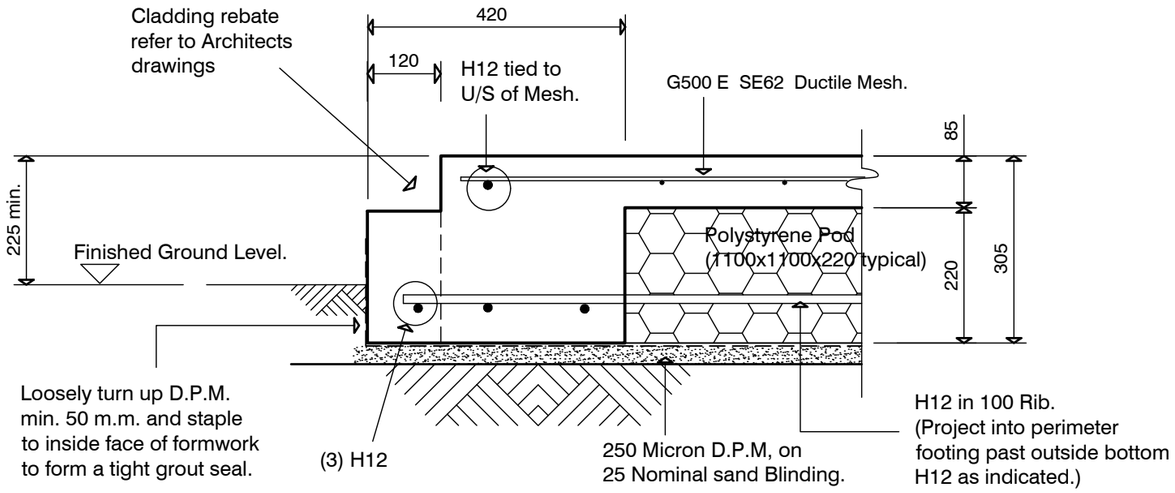
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

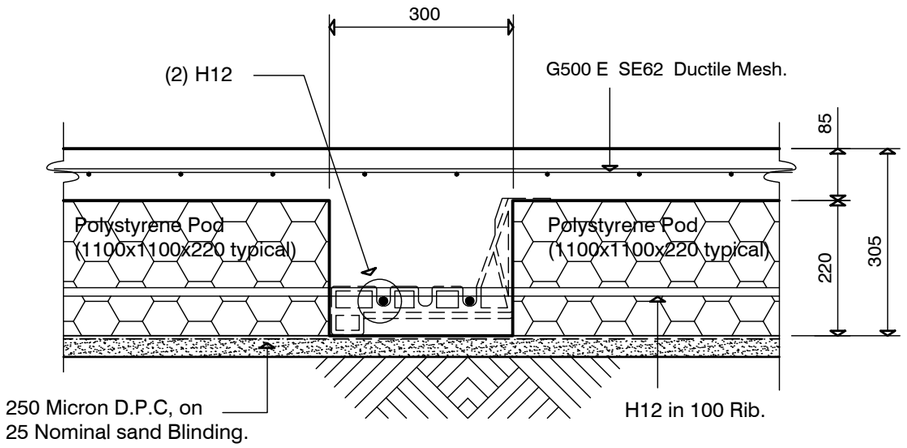
TYPICAL FOUNDATION SECTIONS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26
dwg	S3
rev.	



SECTION 3
1:10 S2



SECTION 5
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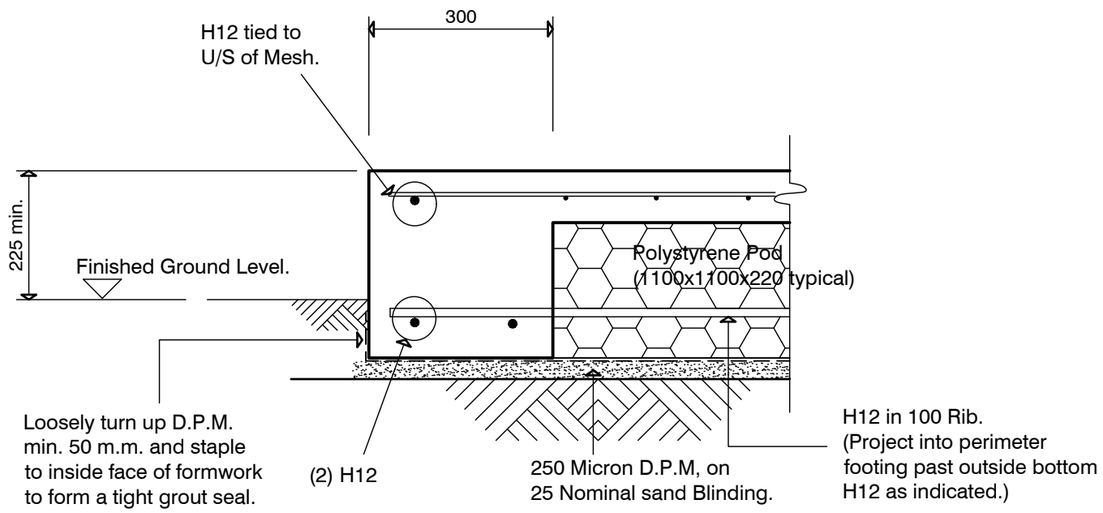
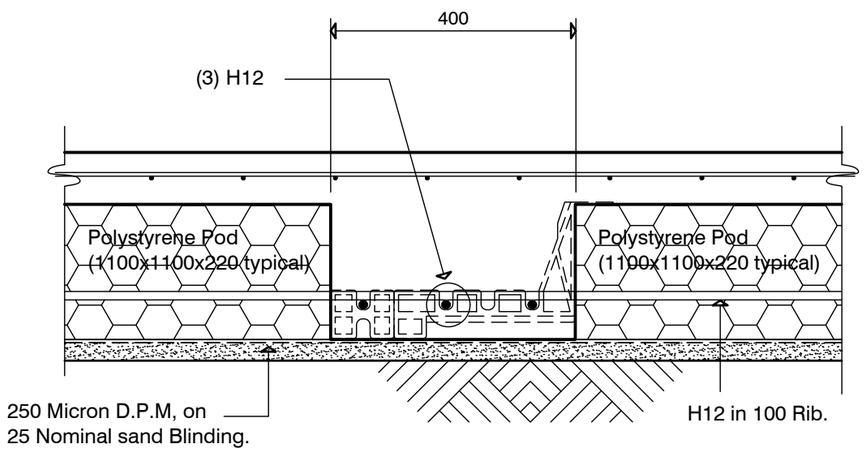


SECTION 4
1:10 S2



SECTION 6
1:10 S2

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

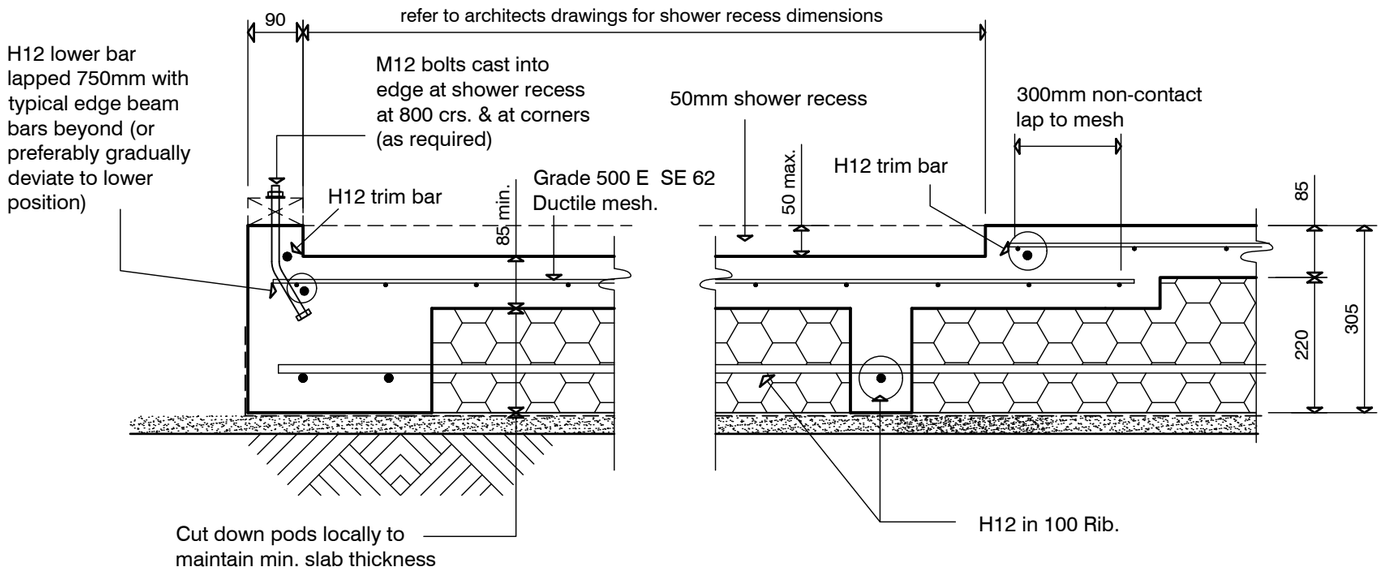
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
dwg S4
rev.



TYPICAL SHOWER RECESS

1:10

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

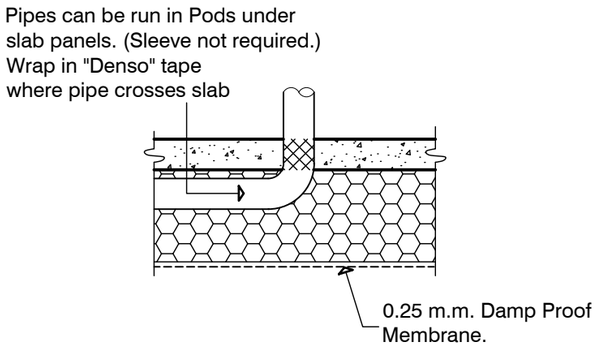
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

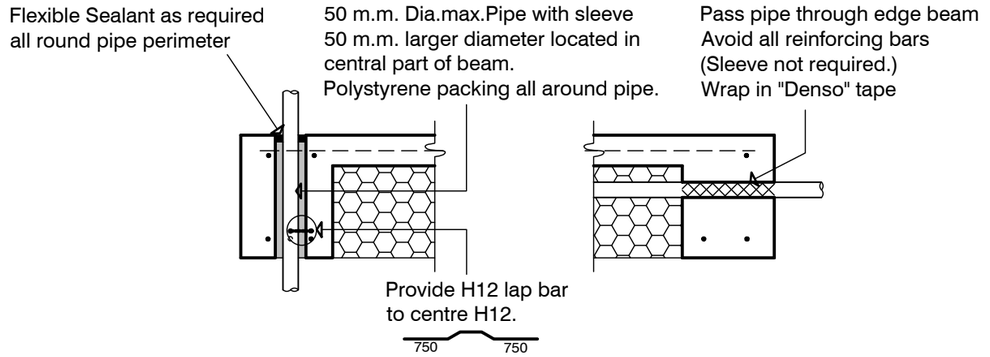
design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26	
dwg	S5	rev.



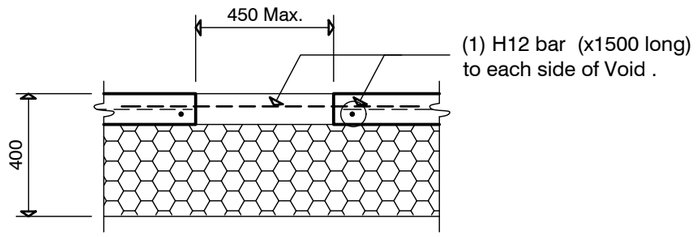
SLAB SERVICES PENETRATION DETAIL.

1:20



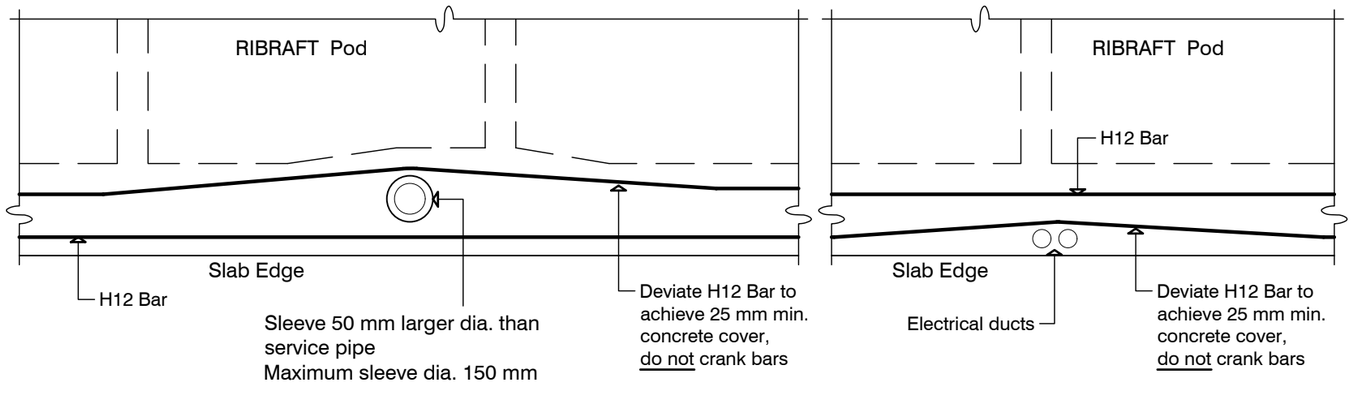
FOUNDATION SERVICES PENETRATION DETAILING.

1:20



LARGE SLAB PENETRATION DETAIL.

1:20



FOUNDATION SERVICES PENETRATION DETAILING

1:20

Services shall not run along ribs or edge beams.

PIPE NOTE:
No separation required where
pipes are fully contained within slab.
Sleeve all drains that pass through the
base of the slab.

PENETRATIONS NOTE:
Where penetrations through
Floor Slab exceed 500 m.m. Square,
Crack Control Bars will be required.

Ideally, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, but this may not always be possible. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams.
The maximum diameter of the services shall be as outlined in table below.

MAXIMUM DIAMETER OF PIPE SERVICES		
ELEMENT	**VERTICAL SERVICES**	**HORIZONTAL SERVICES**
300mm wide edge beam	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, unless detailed as per note 1.
500mm localised wide edge beam	100mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
300mm wide internal load bearing rib	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
100mm wide internal rib	Nil	50mm in a duct 50mm larger diameter than pipe, see note 1.
Slab	110mm in a duct 50mm larger diameter than pipe or for large services 450mm square see also note 2.	Nil

(1) The need for a duct 50mm larger than the service diameter can be deleted when the pipe work does not cross the interface between the bottom of the RibRaft system and the ground at any point along its length. An example would be services laid within the plane of the pods and passing through the edge beam and discharging to a gully trap or similar. In these cases the diameter of the service can be increased to a maximum of 100mm and a service duct is not required. The pipe work shall be wrapped in denso tape where it crosses concrete elements to prevent adhesion between the concrete and pipe work.

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL SERVICES
PENETRATION DETAILS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26
dwg	S6
rev.	

Christchurch City Council

Certificate Attached to Project Information Memorandum

Section 37, Building Act 2004 *Form 4 – Building (Forms) Regulations 2004*

Project number	BCN/2020/10038	**Date issued**	14 October 2020

The building

Street address	8 Hoffman Street Burwood
Legal description	Lot 460 DP 549008
Building work	Construction of dwelling with attached garage

The owner

Name of owner	Lynley Claire Bunn
Mailing address	[redacted]

Restrictions on commencing building work under the Resource Management Act 1991

The building work referred to in the attached building consent is also required to have the following resource consents under the Resource Management Act 1991:

- **Chapter 14 Residential - 14.12 Rules - 14.12.2 Built form standards - 14.12.2.7 Landscaping:** The full length of the road frontage not used as vehicle or pedestrian access, shall be landscaped to a minimum depth of 2m. *The required landscaping has not been indicated on the proposed plans.*
- **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Visibility Splay:** All vehicle access to and/or from a site in a residential zone, shall allow clear visibility above 1 metre within a triangle measured for a width of at least 1.5 metres either side of the entrance, and for a length at least 2 metres measured from the road boundary. *More information needs to be supplied to confirm compliance, or otherwise, with this rule.*
- **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Access Width:** All vehicle access to and within a site in a residential zone shall have a maximum formed width of 4.5m. *The proposed access is 4.8 metres wide.*
- **Chapter 9 Natural and Cultural Heritage - 9.4 Significant and other Trees - 9.4.4 Rules - 9.4.4.1 Activity Status Tables - 9.4.4.1.1 Permitted Activities: P12:**

  Earthworks within 5 metres of the base of any tree in:
  i. parks, public open space or road corridors in Christchurch City; or
  ii. Parks, public open space or road corridors in Akaroa as shown in Appendix 9.4.7.4;

  Activities shall be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator.

  The earthworks for driveway and vehicle crossing will be undertaken within 5 metres of the base of the street tree and no information has been provided to determine whether the works will be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator (Citycare or TreeTech).

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

As these resource consents will or may materially affect the building work to which the attached project information memorandum relates, until they have been granted:

Building work may only proceed to the extent stated below:

The building may be constructed and inspections may occur but the above matters must be addressed before the building is habited.

Failure to comply with the requirements of this notice may result in legal action being taken against you under the Resource Management Act 1991.

If you have any queries regarding your Section 37 please contact the Duty Planner via email dutyplanner@ccc.govt.nz or alternatively phone the Contact Centre on (03) 941 8999.

Signed for and on behalf of the Christchurch City Council:

Duty Planner
dutyplanner@ccc.govt.nz
Phone: (03) 941 8999

Certificate Attached to Project Information Memorandum

Section 37, Building Act 2004 *Form 4 – Building (Forms) Regulations 2004*

Project number	BCN/2020/10038	**Date issued**	14 October 2020

The building

Street address	8 Hoffman Street Burwood
Legal description	Lot 460 DP 549008
Building work	Construction of dwelling with attached garage

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Name of owner	Lynley Claire Bunn
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If you have any queries regarding your Section 37 please contact the Duty Planner via email dutyplanner@ccc.govt.nz or alternatively phone the Contact Centre on (03) 941 8999.

Signed for and on behalf of the Christchurch City Council:

Duty Planner
dutyplanner@ccc.govt.nz
Phone: (03) 941 8999

Project Information Memorandum (PIM)

Application type	Residential detached dwelling
Application number	BCN/2020/10038
Applicant	A.S.C.A.D Limited 59 Warwick Road, RD 5, Rangiora 7475
Owner	Lynley Claire Bunn [redacted]
Issue date	14 October 2020
Location	8 Hoffman Street Burwood Lot 460 DP 549008
Description	Construction of dwelling with attached garage

Critical issues for this project

This summary highlights specific information required to progress an application through the various stages. Detail for these items will be found in corresponding sections of this document.

Resource consents and planning authorisations (including authorisations from Environment Canterbury) required before construction commences:

Clause	Section in this document
Non-compliance with Christchurch District Plan	Planning
Critical issue: District Plan	Planning

Information required before a building consent can be issued:

Clause	Section in this document
Sediment control: general building site	General advice on the project
Critical advice: Building restrictions / easements	General advice on the project

Information required before a code compliance certificate can be issued:

Clause	Section in this document
Critical issue: Services	Services

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PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

The following matters have been identified in respect of the above building project:

Planning

City or District Plan zone

This property is in the Residential New Neighbourhood zone in the Christchurch District Plan.

City or District Plan compliance

Critical issue: Implications of District Plan review on PIMs

Please note that the Christchurch District Plan may be reviewed from time to time.

The issuing of a PIM does not protect this development from future changes to the District Plan. A PIM is a statement of information relevant to the building proposal at the date of issue of the PIM, including its status under the District Plan at that time.

When any new District Plan rules come into effect, some aspects of building proposals may no longer comply, in which case a resource consent would need to be obtained. To protect against the effects of future plan changes you are able to apply for a Certificate of Compliance (if your proposal is a permitted activity) or resource consent under the current plan rules. Certificates of compliance and resource consents are valid for five years and protect a proposal against changes to the District Plan during that period.

Resource consent or other planning authorisation required

(Section 37 certificate attached)

Critical issue: Non-compliance with Christchurch District Plan

- The project does not comply with the Christchurch District Plan on the following matters:
  - **Chapter 14 Residential - 14.12 Rules - 14.12.2 Built form standards - 14.12.2.7 Landscaping:** The full length of the road frontage not used as vehicle or pedestrian access, shall be landscaped to a minimum depth of 2m. *The required landscaping has not been indicated on the proposed plans.*
  - **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Visibility Splay:** All vehicle access to and/or from a site in a residential zone, shall allow clear visibility above 1 metre within a triangle measured for a width of at least 1.5 metres either side of the entrance, and for a length at least 2 metres measured from the road boundary. *More information needs to be supplied to confirm compliance, or otherwise, with this rule.*
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  - **Chapter 9 Natural and Cultural Heritage - 9.4 Significant and other Trees - 9.4.4 Rules - 9.4.4.1 Activity Status Tables - 9.4.4.1.1 Permitted Activities: P12:**

    Earthworks within 5 metres of the base of any tree in:
    i. parks, public open space or road corridors in Christchurch City; or
    ii. Parks, public open space or road corridors in Akaroa as shown in Appendix 9.4.7.4;
    Activities shall be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator.

    The earthworks for driveway and vehicle crossing will be undertaken within 5 metres of the base of the street tree and no information has been provided to determine whether the works will be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator (Citycare or TreeTech).

If you wish to continue with the project your options are to either:

- Provide amended plans showing compliance with the Christchurch District Plan with your application for building consent, or
- If compliance is not achieved, an application for a resource consent must be made. No work may commence until any required resource consent is granted. If applying for a resource consent, please state the project number above as reference.

For your information, a Guide to Resource Consent Processing Costs is available from our website at ccc.govt.nz/consents-and-licences/resource-consents/resource-management-fees.

A building consent may be issued prior to the approval of this resource consent, however this will be subject to the certificate as attached.

Land characteristics and hazards

Development levels and flooding

Development levels

- **Ground Level:** Minimum section levels have been set as part of the underlying subdivision requirements. The site level is not to be lowered without consultation with a Building Consent Officer in the Council's Building Consenting Unit, Consents & Compliance group.
- **Acceptable Solution E1/AS1 - Minimum Acceptable Floor Level:** Unless using a specifically designed "alternative solution" suspended floors and slabs on ground shall be at least 150mm above the finished level of the surrounding ground immediately adjacent to the *building*, and;
  - For sites level with or above the road, no less than 150mm above the road crown on at least one cross-section through the *building* and roadway (refer figure 1 E1/AS1 Paragraph 2.0.1a).
  - For sites below the road, no less than 150mm above the lowest point on the site boundary (refer figure 2 E1/AS1 Paragraph 2.0.1b).

Ground conditions

Technical Category

- **TCNA: Technical Category Zone classification:** The sub-classification for the site is **Technical Category not applicable.** Non-residential properties in urban areas, properties in rural areas or beyond the extent of land damage mapping, and properties in the Port Hills and Banks Peninsula have not been given a Technical Category.

  Applications for building consent approval are subject to investigation by Geotechnical Engineers or engineering geologists to assess risk and provide development and mitigation advice as necessary. A report (and if necessary a foundation and drainage support design) will be required to support an application for building consent.

Land characteristics and hazards – other issues

Development constraints

- Council records show there are specific conditions on the use of this site regarding the following matters:
  - **Consent Notice:** Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific foundation design by a suitably experienced chartered engineer or by an appropriately qualified geotechnical engineer. The design shall take into consideration the potential for liquefaction and associated effects (vertical settlement and lateral spread) and shall be investigated in accordance with MBIE Guidelines "Repairing and rebuilding houses affected by

the Canterbury earthquakes" (December 2012) or subsequent revision document. Any structure requiring a Building Consent, in terms of Building Act provisions, shall have specific Any foundation design required will need to be in accordance with the technical category for the individual lots as defined by the Geotechnical Completion Report - Prestons Park Stage T6, T7 and U2 - Revision 0 prepared by Aurecon and dated 13 August 2020 and any additional restrictions noted within the report.

- **Consent Notice:** This Lot is identified as Density B and is to be developed in accordance with the relevant provisions of the Residential New Neighbourhood (Prestons) zone.

Services

Water supply

- **Residential:** A new water supply is required to be supplied for this project. The details of the position of this new connection will be required with the building consent application. Fees payable are set out in the published fee schedule which is available from our website at www.ccc.govt.nz/the-council/fees-and-charges/fees-building-control.

Critical issue: Services

- **"As-Built" Plans Unavailable:** The location of the service laterals to serve this property are not yet recorded on the Council's drainage plan record.

Reticulated systems

- **Sewer And Stormwater Discharge:** Sanitary sewer and stormwater is to be discharged to their respective laterals required to be installed as part of the underlying subdivision.
- **Local Vacuum Sewer System Zone:** This property is in an area zoned for a local vacuum sewer system within the Christchurch Wastewater Sewerage Network. For further information contact wastewatercapacity@ccc.govt.nz
- **Water Related Services Pipework Within Private Property:** The laying of sewer, stormwater and water supply pipework within private land which will remain in private ownership requires a building consent, compliance with the New Zealand Building Code, and must be installed by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Protection Of Private Drainage Systems:** The private drainage systems must be protected in an approved manner where they could be damaged by vehicular traffic, impact, tree root penetration, or any other source.
- **Sanitary Fittings And Associated Plumbing Works:** The installation of sanitary fittings and associated plumbing works must be carried out by a person holding an appropriate registration under the *Plumbers, Gasfitters And Drainlayers Act 2006*. Evidence of compliance is provided through the issue of a code compliance certificate upon completion of the works.
- **Interceptor / Silt Traps:** Where surface water drainage is proposed to connect directly to any open or piped stormwater system under the Council's control a master trap or silt trap, or similar device, situated in an approved position within the premises, will be required.

Roading and vehicle access

Vehicle crossings

- **Vehicle crossings** are required to be constructed in accordance with Council's Standard Specifications (a copy of which is available from the Council). On default the Council will undertake to repair or construct the crossing at the **property owner's cost**.

The Road Amenity & Asset Protection Team is to be notified 24 hours prior to:

- The concrete to the culvert being poured; *and*
- Final sealing of the crossing.

Where alterations are required to stormwater pipes or other on street facilities including but not restricted to; e.g. manhole tops, poles, trees, landscaping, signs, pedestrian crossing etc., the owner is to meet the cost of the required alterations.

The owner is required to get Council approval for any vehicle crossing before the work proceeds.

Temporary use of legal road

- An application is required where roadway, footpath or berm areas are required for development purposes. This includes areas used for waste skips, parking of contractors' vehicles, etc. Please note that use of this land without permission may result in an infringement notice being issued by our Parking Team which may include fines. Please contact the Road Amenity & Asset Protection Team on 941 8999.

Nuisance on the street

- An adequate supply of water shall be available at all times to ensure the site and truck loads are dampened down to **prevent dust and debris** being deposited on the footpath, roadway and adjoining properties. The footpath and roadway are to be cleaned down at regular intervals as required.

Licensing and regulations

LPG storage

- **Non certifiable (under 100kg):** The following requirements are *in addition to Building Code requirements* and apply to ensure compliance with the Health and Safety at Work (Hazardous Substances) Regulations 2017.
- Cylinders shall be positioned on a concrete base or concrete pavers.
- An approved hood, covering such fittings as valves, hoses, seals plus cylinder valve caps shall be fitted and the appropriate warning notice located on or beside the gas cylinders.
- Cylinders that are filled in situ shall have not less than 500mm between the valve top and underside of an opening window, while exchange cylinders shall have not less than 150mm.
- An approved method of restraint shall be installed to prevent the likelihood of cylinders falling, e.g. chain fixed to wall.
- Openings into a building or a drain are not permitted within 1 metre of the gas cylinders.
- The surface of building elements (including fences) within 1 metre of the cylinders is to be sealed to prevent gas from spilling to the neighbouring site or under the building, and be of non-combustible construction.
- 9kg cylinders for gas hobs in kitchens shall be installed outside. If this is not possible, they must be in a position where they are directly vented to the outside.

Further information is available by contacting Worksafe New Zealand 0800 030 040 or www.worksafe.govt.nz.

Development contributions

No additional demand on Council infrastructure

- **Development contribution assessment:** This development has been assessed for the requirement to pay development contributions, and has been found to **not** require a payment **at this time**. Development contribution requirements are as defined in Council's Development Contributions Policy

established under the Local Government Act 2002. Full details of the policy are available from our website at www.ccc.govt.nz/consents-and-licences/development-contributions/.

General advice on the project

Property Listed on the LLUR

- Listed Land Use Register: Environment Canterbury's Listed Land Use Register (LLUR) has identified this site as being contaminated or potentially contaminated from current or previous land use activity included on the Hazardous Substances and Industries List (HAIL). The provisions of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health may need to be complied with.

Construction nuisance

- The project must comply with the Health Act 1956, Section 29. The premises should be constructed or demolished so as not to cause a nuisance in terms of the Act (i.e. dust).

  The Resource Management Act 1991 places a general obligation on persons, including builders and demolition contractors to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level.

Critical issue: Sediment control: general building site

- The building site has the potential to discharge sediment to the Council's stormwater drainage system and/or the local waterway. A stormwater and sediment management plan will need to be provided at the time of building consent application to demonstrate mitigation or avoidance of sediment discharge beyond the site boundaries.

  For further information, "Best Practice Guidelines" can be found on the Environment Canterbury (ECan) website at esccanterbury.co.nz/sediment-control or contact the Council's Duty Building Consent Officer on telephone 941 8999.

  Note: "Building work" includes siteworks. No site preparation that may cause uncontrolled discharge of stormwater and/or sediment is to be carried out until a building consent has been obtained and stormwater diversion and sediment fences are in place.

Critical issue: Building restrictions / easements

- **"As-Built" Plans Unavailable:** As no "as-built" plans are yet available it is unknown if this site is affected by any Council easements, pipelines, open drains, waterways or building line restrictions. You are advised to check when plans become available.

General advice: Building

- **Adverse Effect On Adjoining Properties:** The developer is required to mitigate any adverse effect on adjoining properties. Failure to undertake such works may mean that the developer has some responsibility to adjacent owners at law.
- **Stormwater Control:** No person shall allow stormwater originating from within or flowing into their land to discharge onto or into a neighbouring property, other than what would naturally occur from the pre-developed condition, in a manner that is likely to cause nuisance or damage unless the discharge is authorised by a resource consent from Environment Canterbury.

Fees

Additional charges will be made on issue of a building consent if the following services are to be supplied:

- Water supply
- Footpath openings
- Road openings
- Vehicle crossing inspections

If the processing costs of this PIM application differ significantly from the fee paid, a refund or further charge will apply.

Information

- All enquiries to our Customer Call Centre on 941 8999.
- **This document is not an authorisation to commence work.** The project may only proceed subject to the issue of a building consent and any other necessary authorisations being obtained.
- A PIM is only valid at the time of issue as the information is based only upon information the council held at the time of that PIM request being made. The PIM may be re-issued if the information is either no longer relevant or is incorrect.

Signed for and on behalf of the Christchurch City Council:

Robert Carlisle
Team Leader LIM Document & Property Information

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

15 October 2020

A.S.C.A.D Limited
26 Salecia Gardens
Christchurch 8083

Dear Sir/Madam

Confirmation of section 37 certificate removal

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

On 14 October 2020, a section 37 certificate was applied to your project, prohibiting any building work until the following issues were resolved:

The building work referred to in the attached building consent is also required to have the following resource consents under the Resource Management Act 1991:

- **Chapter 14 Residential - 14.12 Rules - 14.12.2 Built form standards - 14.12.2.7 Landscaping:** The full length of the road frontage not used as vehicle or pedestrian access, shall be landscaped to a minimum depth of 2m. *The required landscaping has not been indicated on the proposed plans.*
- **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Visibility Splay:** All vehicle access to and /or from a site in a residential zone, shall allow clear visibility above 1 metre within a triangle measured for a width of at least 1.5 metres either side of the entrance, and for a length at least 2 metres measured from the road boundary. *More information needs to be supplied to confirm compliance, or otherwise, with this rule.*
- **Chapter 7 Transport - 7.4 Rules - 7.4.2 Standards - 7.4.3.7 Access design: Access Width:** All vehicle access to and within a site in a residential zone shall have a maximum formed width of 4.5m. *The proposed access is 4.8 metres wide.*
- **Chapter 9 Natural and Cultural Heritage - 9.4 Significant and other Trees - 9.4.4 Rules - 9.4.4.1 Activity Status Tables - 9.4.4.1.1 Permitted Activities: P12:**

  Earthworks within 5 metres of the base of any tree in:
  i. parks, public open space or road corridors in Christchurch City; or
  ii. Parks, public open space or road corridors in Akaroa as shown in Appendix 9.4.7.4;

  Activities shall be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator.

  The earthworks for driveway and vehicle crossing will be undertaken within 5 metres of the base of the street tree and no information has been provided to determine whether the works will be undertaken by, or under the supervision of, a works arborist employed or contracted by the Council or a network utility operator (Citycare or TreeTech).

The issues listed above have now been resolved as a result of changes to your project plans, which now achieves compliance. The section 37 certificate no longer prohibits you from proceeding with building work. If your building consent was granted / issued after the section 37 certificate conditions were resolved, please ensure that the plans and supporting documents the section 37 certificate relate to are the same as the approved building consent and relevant attachments. If the plans differ you may need to amend your building consent.

You may still require other authorisations before you can commence building work.

Yours sincerely

Stacey Jung
Planning Technician
Planning Team 3

Estimate of construction inspections

As at	28 October 2020
Project number	BCN/2020/10038
Description of consent	Construction of dwelling with attached garage
Site address	8 Hoffman Street Burwood Lot 460 DP 549008

There are provisions that are endorsed on the building consent in relation to inspection during the carrying out of building work. These provisions must be taken to include the provisions of Section 90, Building Act 2004.

Number of inspections allocated: 8

Inspections are required at the following stages of the building work. Please book an inspection with at least 3 working days' notice using the following inspection types. Note, depending on the extent of the building work and the order of construction some inspection types may be required on several occasions:

- **Foundation or Slab** – inspection before pour of concrete foundation footings or slab and including any sub-floor sanitary plumbing or drainage
- **Pre Roof** – inspection before the structure is enclosed, including framing, connections and membrane substrates
- **Pre Cladding** – inspection before wall cladding is installed for cladding systems not included in construction monitoring by owner's consultant
- **Half High Masonry (Half High Brick)** – inspection of cavity and ties to masonry veneer cladding
- **Pre Line (Pre Line including Plumbing)** – inspection before enclosure with linings, including insulation and plumbing in place
- **Drainage** - inspection of wastewater, stormwater or retaining wall drains before covering
- **Interior Tanking (Pre Tile Tanking)** – inspection before tiling showers and roof decks
- **Final Inspection** – inspection at completion of all building work

The fees for the above inspections have been included in the overall building consent fees up to 1 hour per inspection. Where the actual time of an inspection exceeds 1 hour then additional inspection fees will be charged. These additional inspection fees will be based on the fee per inspection and charged in 15 minute increments.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Notes

- A copy of the approved plans must be kept on site.
- **To book an inspection:**
  - Phone: **(03) 941 8222**; or
  - Online: ccc.govt.nz/bookinspection

  Please book your inspections as early as is possible to ensure that an inspector is available.
- **To change or cancel your inspection:**
  - Phone: **(03) 941 8222**

  Cancellations must be made by 4pm the working day prior to your inspection taking place. The Council charges for cancellations made on the day for when the inspection is scheduled to take place.
- Additional inspections may be necessary, depending on the nature of the building work and the manner of construction, or as a result of non-complying or incomplete work. All additional inspections are charged at the rate applicable at the time (see link below) and are invoiced separately. Unused inspections will be refunded.
- Audit inspections may also be carried out to ensure that relevant inspections by the owner's consultants have been carried out, and that a record of these inspections is kept on site.
- Further information on inspections is available on our website at ccc.govt.nz/inspections.
- You can submit construction documents via email to codecompliance@ccc.govt.nz.

Destructive investigations may be required if work is covered in prior to the Council's inspections taking place.

Building Consent Construction Documentation and Advice Notes

As at	28 October 2020
Project number	BCN/2020/10038
Description of consent	Construction of dwelling with attached garage
Site address	8 Hoffman Street Burwood Lot 460 DP 549008

Construction documentation

Under Sections 90, 94, and 45a the following construction documentation is required to be provided for the Christchurch City Council to be satisfied, on reasonable grounds, to issue the code compliance certificate. These may include third-party inspections and certifications that have provisions that are endorsed on the building consent in relation to inspection during the carrying out of building work, and must be taken to include the provisions of Section 90 of the Building Act 2004.

Energy work certificates

- **Electrical:** Provide an electrical safety certificate.
- **Gas:** Provide a gas safety certificate.

Structure: inspections

- **Construction monitoring:** Provide all records of inspections and checks carried out, and a PS4 from your nominated structural consultant **ENGCO** stating that all the necessary aspects of their design has been incorporated into the building. This includes but is not limited to the following work:
  - Site Strip
  - Ribraft Slab pre-pour

Restricted Building Work

- **Restricted Building Work - Brick and block laying:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Carpentry:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Foundation:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Roofing:** Provide Record(s) of Work on regulated form 6A.

Construction statements

- **Under tile shower or deck tanking/waterproof membrane:** Provide a PS3 from your nominated contractor.

Test reports and/or "as-builts"

- **As-built truss layout:** Provide as-built truss plan and layout at time of pre roof inspection.
- **Water reticulation - pipework testing:** Provide completed form B-084.
- **Foulwater and stormwater drains layouts:** Provide as-laid drainage plan at time of drainage inspection.

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www.ccc.govt.nz

Advice notes

Please read and follow the advice notes listed below. Failure to do so may create difficulties in obtaining a code compliance certificate.

- All building work must be carried out in accordance with the approved building consent documents. A full and current copy of the stamped documents must remain on site for reference at all times. This may include approved documents in digital format presented on an electronic device provided they are easily readable. For example documents presented on a smart phone screen would not be considered easily readable.
- A building consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the building consent. A building consent authority may allow a further period if an extension of time to start work is requested.
- An owner must apply for a code compliance certificate as soon as practicable after all building work to be carried out under a building consent is completed. If after two years there has been no application for a code compliance certificate, under Section 93(2)(b), a building consent authority, must decide whether it can issue a code compliance certificate. Council may need to carry out a building inspection to assist with this decision or extend its time to make this decision. At this time we will also invoice any accrued fees associated with the building work.
- If you wish to make changes to your building consent, you must apply for an amendment or a minor variation. An amendment or a minor variation must be granted before the building work is carried out. Refer to www.ccc.govt.nz/consents-and-licences/building-consents/building-consent/change-your-building-consent.
- **Subdivision not completed:** As the building is being built on a subdivision that has yet to be completed, *unless* a Certificate under Section 224 of the Resource Management Act is issued first, verification that the sewer, stormwater, and water supply systems in the subdivision are fully operational and complying is required before connection to these systems may occur. This approval must be from the Council's Subdivision Engineers.
- **Prevention of dust and debris:** An adequate supply of water shall be available at all times to enable the site and truck loads to be dampened down to prevent dust and debris being deposited on the footpath, roadway and adjoining properties. The footpath and roadway are to be kept clean using methods that minimise sediment from entering the stormwater system and waterways.
- **Management plan for the control of stormwater and sediment:** The management plan for the control of stormwater and sediment during construction must be made known to the building contractor before any siteworks are carried out. Failure to comply with the management plan may lead to enforcement action being taken under the Building Act 2004.
- **Site Safety:** Ensure all appropriate site safety measures are provided throughout the contract works to comply with NZ Building Code Clause F5 and all Occupational Safety and Health requirements.
- **Building Location:** The site location of the dwelling will be verified by a Council inspector during their first inspection. If the location cannot be established or is not in accordance with the consented documents, it is the responsibility of the applicant to verify compliance, registered professional surveyor or a licenced cadastral surveyor may need to provide verification of compliance, by providing a Building Location Certificate. The applicant is responsible for remedying an incorrectly located building and for the associated costs.

Building Consent

Section 51, Building Act 2004 *Form 5 – Building (Forms) Regulations 2004*

Building consent number	BCN/2020/10038	**Date issued**	28 October 2020

The building

Street address of building	8 Hoffman Street Burwood	**Location of building within site/block number**	
Legal description of land where building is located	Lot 460 DP 549008		
Building name		**Level/unit number**	

The owner

Name of owner	L C Bunn	**Phone number**	
Contact person		**Landline**	
Mailing address	[redacted]		
Street address/ registered office			
Email address			

First point of contact for communications with the building consent authority:

Name	A.S.C.A.D Limited	**Phone**	(03) 329 2092
Contact person	Andrew Siegenthaler	**Mobile**	
Mailing address	59 Warwick Road, RD5, Rangiora 7475	**Fax**	
		Email address	ascadltd@snap.net.nz

Building work

The following building work is authorised by this building consent:

Construction of dwelling with attached garage

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or any responsibility under any other Act relating to or affecting the building (or proposed building). This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

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Conditions of consent

This building consent is subject to the following conditions:

Under section 90 of the Building Act 2004, agents authorised by the Council (acting as a building consent authority) are entitled, at all times during normal working hours or while building work is being done, to inspect:

- land on which building work is being or is proposed to be carried out; and
- building work that has been or is being carried out on or off that building site; and
- any building.

Compliance schedule

A compliance schedule is not required for the building.

Attachments

Copies of the following documents are attached to this building consent:

- Project information memorandum (PIM)
- Estimate of construction inspections (by Christchurch City Council)
- Building consent construction documentation (including third party certification) and advice notes
- PIM drainage plans
- Approved plans
- Approved specifications
- Approved supporting documents

Cate McPherson

Building Control Officer
03 941 7009

On behalf of: Christchurch City Council
Date: 28 October 2020

aurecon

Prestons Park Subdivision

GEOTECHNICAL REPORT FOR LOT 460

CDL Land NZ Limited

21 August 2020

Revision: 1

Reference: 235361

Bringing ideas to life

Document control record

Document prepared by: James Muirson

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0	20 October 2014	Draft for Review	J Muirson	J Muirson	J Kupec	T Browne
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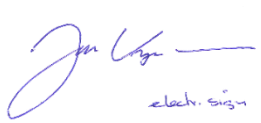
Approval			
Author signature		Approver signature	
Name	Fraser Monteith	Name	Dr Jan Kupec
Title	Engineering Geologist	Title	Technical Director

Contents

Appendices

1 Executive Summary

CDL Land NZ Ltd has commissioned Aurecon New Zealand Ltd to undertake site specific geotechnical investigations and assessments for individual residential lots for building consent purposes for the Prestons South Subdivision Stage 2. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the residential house on Lot 460 at the Prestons South Subdivision.

As part of the subdivision development extensive geotechnical testing, including cone penetration tests (CPTs), were carried out to define the liquefaction potential at the overall subdivision and to monitor the site works that have occurred. **Based on our information the property is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) set by the Ministry of Business, Innovation and Employment (MBIE) in their guidelines issued in December 2012.**

The site development has included extensive bulk earthworks. All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. The engineering sign off and bulk earthworks are documented in the Geotechnical Completion Report. The earthfill at the subdivision construction stage was placed and signed off in accordance with NZS4431:1989. Based on review of the available geotechnical information, including bulk earthworks information and NZS4431 compliance records, we consider that a determination in accordance with NZS3604:2011 Section 3.1.3 is appropriate and the property meets the requirements for NZS3604 type foundations.

The geotechnical site specific assessment comprised a review of previous geotechnical investigations undertaken for the subdivision development and a site specific geotechnical investigation. A single hand auger borehole was undertaken to assess the upper soil profile and groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot, one of the DCPs was located immediately adjacent to the hand auger borehole with the second DCP located on the opposite half of the lot.

Based on our knowledge of the site setting and our past work we recommend that any residential structure that is to be developed on Lot 460 be founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa, which for Lot 460 is achieved at a minimum depth of 0.4m below ground level as this represents the current thickness of the topsoil and loose soil.

This report shall be read as a whole. Our limitations are presented in Section 7.

2 Introduction

CDL Land NZ Ltd is currently undertaking a large residential subdivision with associated commercial lots. Previously Aurecon New Zealand Ltd has undertaken detailed geotechnical investigations and assessments for the purpose of the plan change, subdivision resource consent application, liquefaction assessment, technical classification of the entire subdivision, and observation of bulk earthworks construction.

Aurecon New Zealand Ltd has since been commissioned to undertake site specific geotechnical investigations and assessment of individual lots for building consent application purposes. The site which this report is focused on comprises a single lot, designated Lot 460 at the Prestons South Subdivision to the south of Prestons Road in Marshland, Christchurch. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the proposed house on the lot. We note that at the time of writing this report the location and structural form of the dwelling were unknown, and it is inferred to comprise NZS3604:2011 type residential buildings only.

This report shall be read as a whole. Our limitations are presented in Section 7.

3 Site Conditions

3.1 Site Description

The Prestons Subdivision is located on the northern fringes of Christchurch City. The site is made up of a series of adjacent properties forming an irregular and elongated rectangle shape, orientated approximately north to south. The total area of the overall Prestons Subdivision site is approximately 190ha. The site can be separated into two distinct blocks, Prestons North which runs from the Lower Styx Road in the north through to Prestons Road in the south and the Prestons South development which continues from Prestons Road through to Mairehau Road to the south.

This building consent report is for Lot 460 which is located in Stage 2 of the Prestons South Subdivision development (refer Figure 1 in Appendix A). The lot is bordered by residential lots to the north, west and south, with an access road to the east.

3.2 Surface Water

There are no natural sources of surface water on the subdivision.

3.3 Regional Geology

The geology of the site is described in the 1:250,000 scale geological map – '*Geology of the Christchurch Area*', published in 2008 by the Institute of Geological and Nuclear Sciences. Note this map has been referenced as it is at an appropriate scale and covers the entire site. The map indicates the underlying geology comprises '*Dominantly sand of fixed and semi-fixed dunes and beach deposits'* and '*drained peat swamp*'. The subdivision geotechnical investigation identified that this area was predominantly underlain by aeolian (dune) and beach sand deposits.

The GNS Active Fault System database (GNS, 2012a) indicates that the site is located approximately:

- 27km north east of the eastern end of the Greendale Fault System. Movement on the Greendale Fault System was responsible for the Magnitude 7.1 Darfield (Canterbury) Earthquake on 4 September 2010.
- 14km north of the epicentre of the Magnitude 6.2 Christchurch Earthquake on 22 February 2011.
- 12km north west of the Magnitude 6.0 earthquake on 13 June 2011 (GNS, 2012b).
- 8km north west of the Magnitude 5.9 earthquake on 23 December 2012.

3.4 Site Earthworks

Site earthworks have been undertaken to prepare the site for residential building purposes. The subsurface profile was stripped back and the site was built up with compacted engineered fill. During bulk earthworks shallow organic material, where encountered, was removed as part of the bulk earthworks.

All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. Details of the site bulk earthworks are provided in the Aurecon report titled '*Prestons Park Subdivision – Stages T6, T7 & U2 Geotechnical Completion Report Rev 0'* dated 13 August 2020. The Geotechnical Completion Report has been completed as part of the requirements of NZS4404:2010 '*Land development and subdivision infrastructure*' and Christchurch City Council '*Infrastructure Design Standards - Part 4: Geotechnical Requirements*'. The compacted fill was placed and signed off in accordance with NZS4431:1989 '*Code of practice for earth fill for residential development'*.

3.5 Technical Classification

The landcheck maps historically provided on The Canterbury Earthquake Recovery Authority (CERA) website indicated the site is classified as rural and unmapped. The technical categories were developed by the Ministry for Business, Innovation and Employment (MBIE) with the support from the Engineering Advisory Group (EAG) in mid-2011 and hence prior to the start of the subdivision development. The site has since been modified by civil engineering and bulk earthworks.

As part of the subdivision consent geotechnical assessment, site specific liquefaction assessment was carried out over the wider subdivision area. This is detailed in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013.

Based on the results from our liquefaction assessment and bulk earthworks undertaken on the wider subdivision, Lot 460 is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) in the MBIE Guidelines issued in December 2012.

4 Geotechnical Assessment

4.1 General

The geotechnical assessment comprised a review of relevant previous geotechnical investigations and construction data and an in-situ geotechnical investigation. The geotechnical investigation comprised hand held testing on the individual lot and a review of the previous geotechnical investigations undertaken for the subdivision within the vicinity of the lot. A single hand auger borehole was undertaken to assess the upper soil profile and the groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot. The hand held testing was undertaken on the lot following the site earthworks. The testing density is considered reasonable as the geotechnical project engineers were involved in the observation of the civil engineering works.

4.2 Previous Investigations

The previous geotechnical testing and investigations undertaken by Aurecon across the entire subdivision site comprised of a combination of cone penetrometer tests (CPT) and machine excavated test pits. Further details regarding these investigation locations are found in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013. In addition, testing carried out as part of the subdivision development is presented in the Aurecon Geotechnical Completion Report.

4.3 Hand Held Testing

One hand auger borehole was undertaken on the lot as part of the geotechnical investigation to assess the upper soil profile and the groundwater level. The test location and the borehole log have been uploaded to the New Zealand Geotechnical Database (NZGD). The borehole log is attached in Appendix B.

The hand auger borehole log indicates the upper soil profile consists of topsoil underlain by sand to the termination depth. The hand auger borehole was terminated when soil samples became saturated and the hole started to collapse.

The logging of the recovered hand auger samples was undertaken in accordance with the New Zealand Geotechnical Society's *"Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes: 2005".*

4.4 Dynamic Cone Penetrometers

Two DCPs were carried out with the locations and results uploaded to the NZGD. The DCP test results are attached in Appendix B. One of the DCPs was located adjacent to the hand auger borehole, with the second DCP located on the opposite half of the lot.

DCP logs indicate 5 blows per 100mm penetration, which is equivalent to an ultimate bearing capacity of 300kPa, was consistently encountered from a shallow depth.

4.5 Groundwater Levels

Groundwater levels were measured within the hand auger borehole at the time of the investigation and correlated to our site specific knowledge. An indicative groundwater level was noted where holes collapsed due to saturated soil. Groundwater was encountered at approximately 2.1m depth below ground level. It should be noted that groundwater levels may vary seasonally.

A review of the NZGD indicates that regional groundwater levels are likely to be in the order of 1m to 2m below ground level. These groundwater levels are reasonably consistent with those measured during the investigation, when taking into account the subdivision earthworks filling and cutting.

4.6 Topsoil Depth

The depth of topsoil has been determined from the single hand auger and two DCPs undertaken on site. We note that the topsoil depths may vary by +/- 100mm between the testing locations and hence it is recommended that at least a 100mm tolerance should be allowed for building foundation excavations.

If greater certainty of topsoil depths across the whole site is required for construction costing then further testing would be necessary across the footprint of the proposed structure (unknown at the time of writing this report). **The responsibility and liability for any additional testing shall be met by the section purchaser.**

5 Foundation Recommendations

The site is expected to perform in line with TC1 requirements in future earthquakes. Due to the residential land use of the development, the presence of certified fill and the TC1 technical classification, future residential development will be able to adopt standard NZS3604 compliant foundations.

5.1 Foundation Types

It is recommended that residential structures that are built on Lot 460 are founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa. The site investigation results indicate that approximately 350mm of topsoil was present, which will need to be removed and the clean subgrade exposed for foundation construction.

Based on our understanding of the site works and the investigation results, we recommend that NZS3604:2011 compliant foundations are embedded a minimum depth of 0.4m below current ground level.

5.2 Foundation Construction Recommendations

Construction should proceed in accordance with the NZS3604:2011. Topsoil should be removed from beneath the floor slab and compacted hardfill placed under the floor slab to the required level. In addition, the following recommendations should be considered:

1. To ensure that excavated footings are adequately founded we recommend that excavations should be undertaken by a digger fitted with a smooth edge bucket. The base should be tidily trimmed by hand, lightly compacted with a plate compactor and immediately covered with a concrete tidy slab or 100mm of compacted granular hardfill. A suitable qualified engineer with foundation experience or territorial authority building inspector should be retained to verify the adequate founding has been achieved and all loose and soft or compressible material was removed.
2. If there are significant soft layers beneath a sub-excavation, the softer material will have to be excavated and backfilled with 10MPa concrete or compacted hardfill underneath all load bearing foundation elements. For the hardfill, the sub-excavation will have to have plan dimensions of B+2D where B is the footing width and D is the depth of undercut. For 10MPa concrete the sub-excavation can have the same dimensions as the footing.
3. Depending on the soil encountered, the time of year, and fluctuations of the groundwater level, it is possible that excavations may encounter groundwater. The building contractor is to take appropriate measures to deal with any groundwater ingress to the foundation excavations and keep the excavations and backfill free of groundwater intrusions until the footings are cast.
4. The footing excavations are likely to expose layers of granular soils, which can be adversely affected by rainfall or stormwater. Foundation excavations should not be left open for more than three days. In addition, rainfall and stormwater should not be allowed to pond within the footing excavations as this may affect the bearing capacity of the subsoils.

6 References

Forsyth, Barrell & Jongers, (compliers), 2008. *Geology of the Christchurch Area*. Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 16.

New Zealand Geotechnical Database (2016). Retrieved 1 May 2017 from https://www.nzgd.org.nz

Christchurch City Council, 2010. *Infrastructure Design Standards - Part 4: Geotechnical Requirements.*

Geonet, 2012. ftp://ftp.geonet.org.nz/strong/processed/Proc (23/10/12)

GNS, 2012a. http://maps.gns.cri.nz/website/af/viewer.htm (23/10/12)

GNS, 2012b. http://www.gns.cri.nz/Home/News-and-Events/Media-Releases/earthquake-part-of-aftershock-sequence (23/10/12)

Ministry of Business Innovation and Employment (MBIE), 2012 '*Repairing and rebuilding houses affected by the Canterbury earthquakes'.*

NZGS, 2005. *Guidelines for the Classification and Field Description of Soils and Rocks in Engineering*. NZ Geotechnical Society Inc, Wellington, New Zealand.

NZS 3604:2011. *Timber Framed Buildings*. Standards New Zealand, Wellington, New Zealand.

NZS 4404:2010 *Land development and subdivision infrastructure*. Standards New Zealand, Wellington, New Zealand.

NZS 4431:1989 *Code of practice for earth fill for residential development*. Standards New Zealand, Wellington, New Zealand.

7 Explanatory Statement

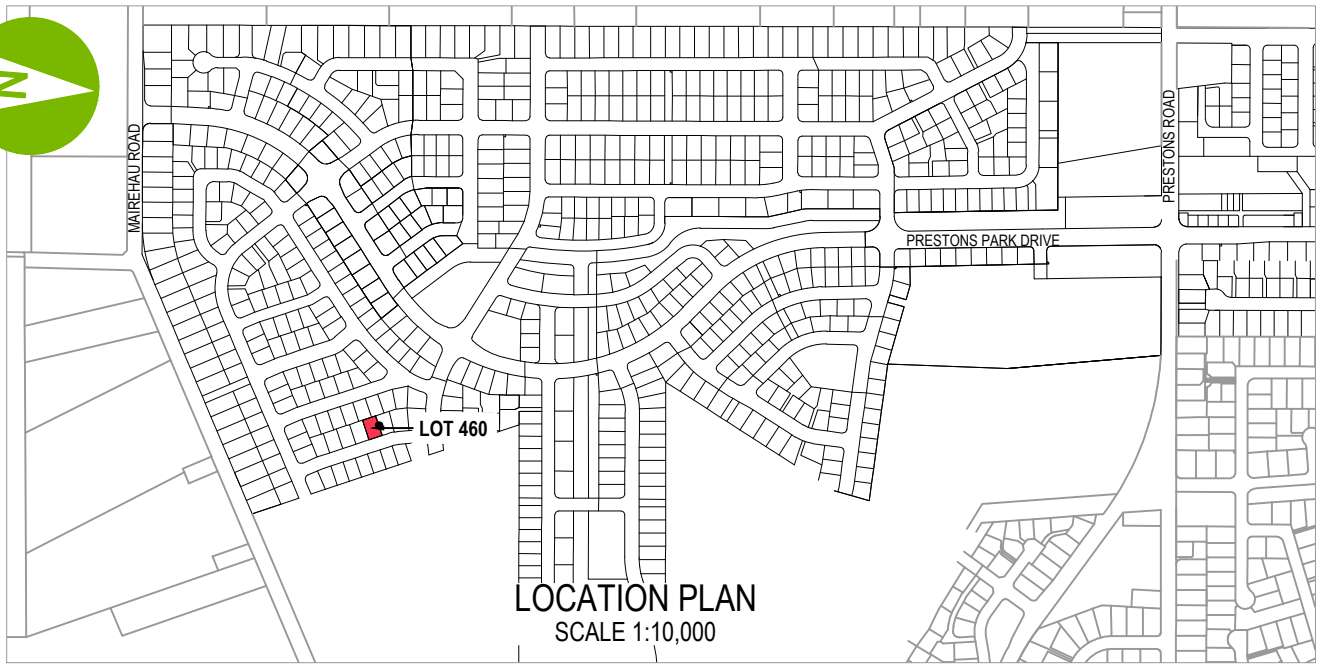
We have prepared this report in accordance with the brief as provided. The contents of the report are for the sole use of the Client for the purpose of building consent application only, and no responsibility or liability will be accepted to any other third party. Data or opinions contained within the report may not be used in other contexts or for any other purposes without our prior review and agreement.

The recommendations in this report are based on data collected at specific locations and by using suitable investigation techniques with limited site coverage. Only a finite amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground and groundwater between test locations has been inferred using experience and judgment and it must be appreciated that actual conditions could vary from the assumed model.

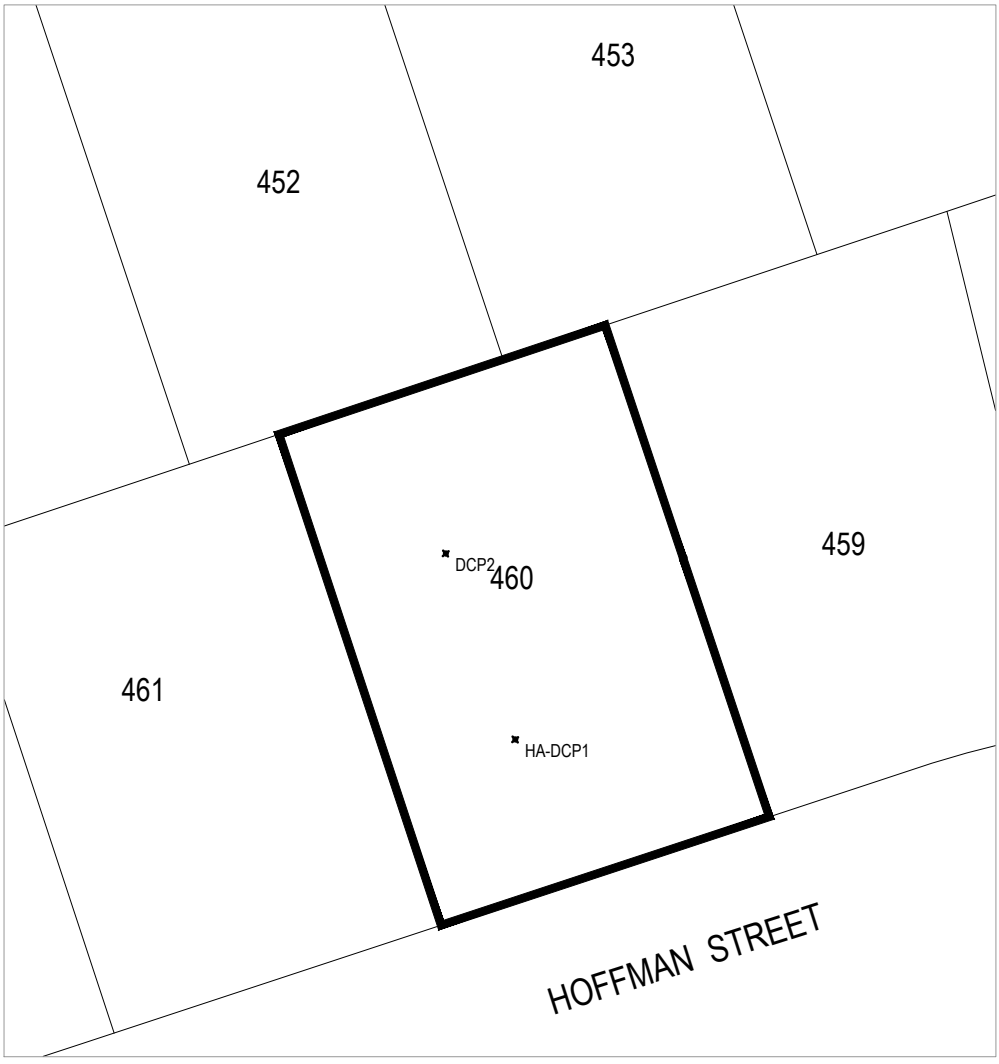
Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

Subsurface conditions, such as groundwater levels, can change over time. This should be borne in mind, particularly if the report is used after a protracted delay.

Appendix A
Figures



LOCATION PLAN
SCALE 1:10,000



4 0 8 16m
SCALE 1:400

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www.aurecongroup.com

CLIENT
PRESTONS PARK

REV	DATE	REVISION DETAILS	APPROVED
A	11/07/19	ISSUE FOR INFORMATION	T BROWNE

DRAWN	DESIGNED
R DAWSON	
CHECKED	
J MUIRSON	
APPROVED	DATE
T BROWNE	
T BROWNE	

PROJECT
PRESTONS PARK

TITLE
LOT 460
SITE LOCATION PLAN
FIGURE 1

INFORMATION
NOT FOR CONSTRUCTION

PROJECT No.	
235361	
SCALE	SIZE
1:400	A4
DRAWING No.	REV
GO-PS-S2-IN-460	A

Appendix B
Test Results

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HAND AUGER RECORD

HOLE NO. **HA1**

PROJECT NO. **235361**

PROJECT	**Prestons Park Subdivision Lot 460**		
CLIENT	**CDL Land NZ Ltd**	CO-ORDINATES (NZTM) **E 1573584 N 5185495**	SHEET **1** of **1**
METHOD	**HA**		DATE from **10/08/2020** to **10/08/2020**
MACHINE & NO.	**NA**	ORIENTATION **VERTICAL**	GROUND-LEVEL **+13.54** m RL

Water level	Tests	Samples (Type Ref Depth)	Reduced Level	Depth (m)	Legend	STRATA DESCRIPTION
		0.00		0.00		Silty fine SAND and trace rootlets; brown. Moist. [TOPSOIL]
			+13.19	0.35		Fine to medium SAND; light brown. Dense, moist.
		HA				0.60m ... Very dense.
▼						1.90m ... Wet.
						2.10m ... Saturated.
			+11.24	2.30		End of Hand Auger at 2.30m, on 10/08/2020 *Termination Reason:* Effective refusal, hole collapse

- Small Disturbed Sample
- Large Disturbed Sample
- SPT Liner Sample
- Thin Wall Undisturbed Sample
- U100 Undisturbed Sample
- Pocket Penetrometer Test
- Piston Sample
- Water Level
- Impression Packer Test
- Standard Penetration Test
- Permeability Test
- Piezometer / Standpipe Tip
- Packer Test
- In-situ Vane Shear Test

LOGGED **F. MONTEITH**

DATE **10/08/2020**

CHECKED **K. FOOTE**

DATE **18/08/2020**

REMARKS

Groundwater encountered at 2.1m bgl.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Report ID: AGS4 HAND AUGER RECORD || Project: LOT 460.GPJ || Library: AGS 4_0.GLB || Date: 21 August 2020

Aurecon, Level 2 Iwikau Building, 93 Cambridge Terrace, Christchurch 8013. Tel: 03 366 0821 Fax: christchurch@aurecongroup.com

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www.aurecongroup.com

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO.
DCP1

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573584
N 5185495

GROUND LEVEL **+13.54** m RL

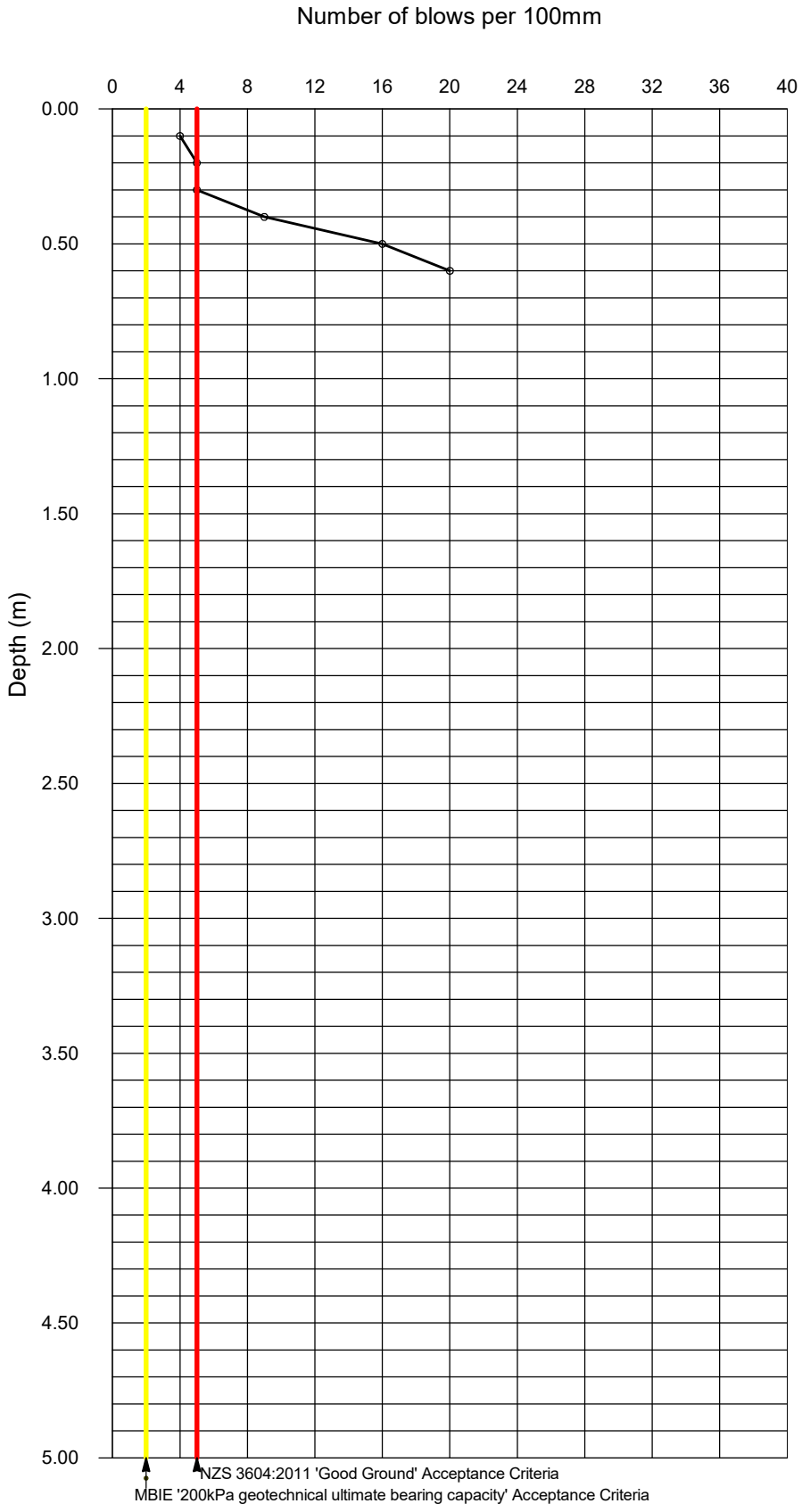
TESTED / SUPERVISED BY **F. MONTEITH**
DATE **10/08/2020**

CHECKED BY **K. FOOTE**
DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	5
	5
	9
0.5	16
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

20 blows for 100mm in the last increment.
Co-ordinates and elevation data from site survey.
Elevation based on Christchurch Drainage Datum.
Effective refusal, 20+ blows per 100mm

Report ID: AGS4 DCP (SCALA) RECORD (5M) || Project: LOT 460.GPJ || Library: AGS 4_0.GLB || Date: 21 August 2020

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO. **DCP2**

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573574
N 5185491

GROUND LEVEL **+13.56** m RL

TESTED / SUPERVISED BY **F. MONTEITH**

DATE **10/08/2020**

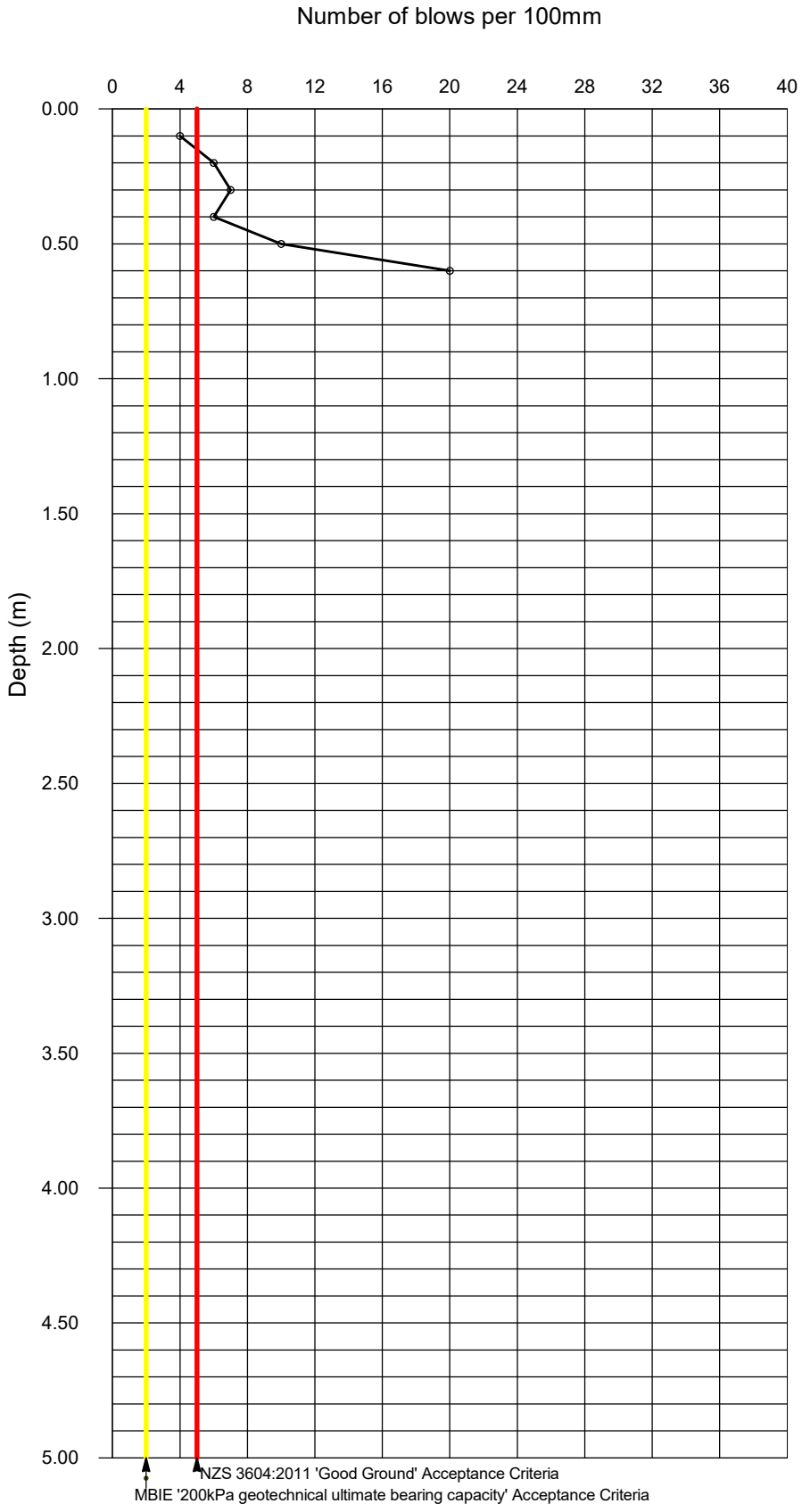
CHECKED BY **K. FOOTE**

DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	6
	7
	6
0.5	10
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

4 blows for 20mm in the last increment.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Effective refusal, 20+ blows per 100mm

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Bringing ideas to life

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Christchurch 8013
New Zealand

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F +64 3 379 6955
E christchurch@aurecongroup.com
W aurecongroup.com

Aurecon offices are located in:
Angola, Australia, Botswana, China,
Ghana, Hong Kong, Indonesia, Kenya,
Lesotho, Macau, Mozambique,
Namibia, New Zealand, Nigeria,
Philippines, Qatar, Singapore, South Africa,
Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam.

Application for a project information memorandum and/or building consent

Section 33 or Section 45, Building Act 2004, *Form 2 - Building (Forms) Regulations 2004*

About this form

- Please check on our website (ccc.govt.nz/building-consent-forms-and-guides) that the form that you are using is current at the time of application as forms are subject to change without notice.
- General information can be found on our website at www.ccc.govt.nz/goahead
- A building consent is the formal approval issued by a Building Consent Authority (BCA) to ensure certain works meet the requirements of the Building Act 2004, Building Regulations and the New Zealand Building Code.

GENERAL INFORMATION:

- **Application fees and charges:** The latest Building Consents Fee Schedule is available on our website at ccc.govt.nz/fees-building-control or from one of our Council service desk (ccc.govt.nz/contact-us). A building consent will not be issued by the Council until all fees and charges relating to that consent application have been paid in full. When applying for a building consent the costs/charges will vary depending on the time a building consent officer spends processing your consent. Ensure all reasonable information applicable to your application is provided. Requests for further information will impact on the processing time and costs of a consent.
- For general enquiries please phone (03) 941 8999 or email info@ccc.govt.nz
- Christchurch City Council reserves the right, from time to time, to contact customers in regard to the services provided.

SUBMITTING AN APPLICATION:

An application can be lodged via the following methods:

- **Online** via onlineservices.ccc.govt.nz. You will need to register to use Online Services. You can register at onlineservices.ccc.govt.nz
- **Post** (additional costs apply) your application to: Consenting & Compliance Group, PO Box 73013, Christchurch 8154
- **Hand delivered** (additional costs apply) to Civic Offices, 53 Hereford Street, Christchurch Central or dropped off at any Council service desk (ccc.govt.nz/contact-us).

All applications will be checked for completeness prior to acceptance. Please ensure that you have compiled your documents carefully to avoid delays in accepting your application. If your application is incomplete it will not be accepted and the statutory processing timeframe will not start until the missing information has been provided and resubmitted.

*Items marked * are mandatory for all applications.*

1. The building

Street address of building:* *(for structures that do not have a street address, state the nearest street intersection and the distance and direction from that intersection)*

Hoffman Street, Prestons Park

Legal description of land where building is located:* *(state legal description as at the date of application and, if the land is proposed to be subdivided, include details of relevant lot numbers and subdivision consent)*

Lot 460 DP 549008

Building name:

Location of building within site/block number: *(include nearest street access)*

Number of levels:* *(including ground level and any levels below ground)*

1

Level/unit number:

Area: *(total floor area; indicate area affected by the building work if less than the total area)*

Total floor area:*	Existing floor area:	New floor area:
184.7		184.7

Current, lawfully established, use:*
(include number of occupants per level and per use if more than 1)

Year first constructed:

2. The owner [Must be completed for all applications and all details must be the owner's]

Name of owner:* *(include preferred form of address, e.g. Mr, Mrs, Ms, Miss, Dr if an individual)*

Lynley Bunn

Contact person: *(not required if the applicant is an individual)*

Mailing address:*

[redacted]

s: Fax:

The following evidence of ownership is attached to this application: *(copy of certificate of title, lease, agreement for sale and purchase, or other document showing full name of legal owner(s) of the building)*

A recent copy of certificate of title(s) (less than six months old) and where applicable the following:

☐ Lease ☒ Agreement for sale and purchase ☐Licence or property management agreement
☐ Other document *(showing full name of legal owner(s) of the building)*

Certificate of title(s) are available from the Christchurch City Council for a fee. Required? ☐ Yes ☒ No

3. Agent

Name of agent: *(only required if application is being made on behalf of the owner)*
a.s.c.a.d. ltd

Contact person: *(not required if the applicant is an individual)*
Andrew Siegenthaler

New Zealand Companies Registered Number: *(If applicable - Refer to www.business.govt.nz/companies)*

Mailing address:
59 Warwick Road, RD5, Rangiora 7475

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
033292092				

Email address: ascadltd@snap.net.nz

Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*
Draughtsmen

First point of contact for communications with the council/building consent authority: *(contact details must be in New Zealand)*

☐ Agent ☒ Owner ☐ Other: *(if other specify whom and provide contact details as per above)*

4. Application

***I request that you issue a** ☐ *project information memorandum* / ☒ *project information memorandum and building consent* / ☐ *building consent* **for the building work described in this application.**

This application is for:

☐ Amendment to building consent: *Write building consent numbers of original consent*

☐ Staged building consent – Stage of *Write building consent numbers of previous stages*

For stage 1: Proposals to stage the building work to construct or alter a building are required to be approved by Council prior to lodging the application for a building consent for the first stage. *Please attach evidence of approval of your staging proposal by the Council to your first stage application* (visit our website for more guidance).

For stage 2+: Have you made any changes to the building work that has been approved under a previous stage?

☐ No ☐ Yes – if yes, please list details of the changes *(and highlight these changes in the attached plans and specifications):*

☐ National Multiple Use Approval: *Write national multiple use approval number*
(If yes, provide copies of MultiProof certificate, plans and specifications)

go ahead...

Christchurch City Council

I wish to receive my building consent/PIM and approved documentation in the following format:

☒ Electronically via Online Services

☐ CD

☐ Hard copy *(additional costs apply)*

The CD or hard copy documents are to be collected from:

All consent related invoices to be billed and sent via ☒ email or ☐ post to: ☒ Owner ☐ Agent

I / we understand that the fees charged at lodgement **are a deposit only**, and that the Council will charge me / us for all costs actually and reasonably incurred in processing this application. These will be paid before the consent is issued and the building work started.

All of the included information on this form is, to the best of my knowledge, true and correct. I understand that all plans, documentation and reports submitted as part of an application are required to be kept available for public record, therefore the public (including business organisations and other units of the Council) may view this application, once submitted. All development contributions charges (where applicable) will be billed to the owner(s) as shown on page two.

I / we understand that no work is to commence until the building consent is uplifted.

Signature of owner/agent:* *(on behalf of and with the authority of the owner)*

Date:* 30/09/2020

Print name: Andrew Siegenthaler

If you are signing this application on behalf of a company/trust/other entity (the applicant), you are declaring that you are duly authorised to sign on behalf of the applicant to make such an application.

By signing this application you are accepting responsibility to pay all actual and reasonable costs incurred by the Christchurch City Council. Where an invoiced amount has not been paid by the stated due date, the Council may commence debt recovery action. The Council reserves the right to charge interest, payable from the date the debt became due, and recover costs incurred in pursuing recovery of the debt.

PRIVACY INFORMATION:
If you would like to request access to, or correction of, your details, please contact the Council.

5. The project

Description of the building work:*

3 bedroom domestic dwelling with attached double garage

Will the building work result in a change of use of the building?* ☐ Yes ☒ No

If yes, provide details of the new use:

Intended life of the building if less than 50 years: years

List building consents previously issued for this project below *(if any)*: ☒ None

Building/PIM*:	Resource:	Subdivision:	ECan:

Were there pre-application meetings prior to this application being made?

☒ No ☐ Yes - Pre-application reference number *(if applicable)*:

Estimated value of the building work on which the building levy will be calculated *(incl. GST)*:* $ 378000
(state estimated value as defined in section 7 of the Building Act 2004)

If this is an application to amend a building consent, advise the estimated value of amended building work *(incl. GST)*: $

- Is this in addition to, or reduction from, what was stated with the original application? ☐ Addition ☐ Reduction ☐ No change

6. Restricted building work

Will the building work include any restricted building work?* ☒ Yes ☐ No

If Yes, provide the following details of all licensed building practitioners who will be involved in carrying out or supervising the restricted building work. *(If these details are unknown at the time of the application, they must be supplied before the building work begins.)*

NOTE: If requested, only the building practitioners marked 'yes' below may download, once approved and paid, the building consent documentation through online services. To gain access the building practitioners will need to phone 03 941 8999 or email onlineservices@ccc.govt.nz.

Designer or Architect:			
Name of LBP:	Andrew Siegenthaler	Registration or LBP number:	BP108550
Licensing class:	Design 2	Certificate of design work attached?	☒ Yes
Access to download building consent approved?	☒ Yes		

Structural Engineer:			
Name of LBP:		Registration or LBP number:	
Licensing class:		Certificate of design work attached?	☐ Yes
Access to download building consent approved?	☐ Yes		

Builder:			
Name of LBP:		Registration or LBP number:	
Licensing class:		Record of building work attached?	☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐Yes		

Note: Continue on another page if necessary.

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Christchurch City Council

7. Project information memorandum (this section is not applicable if this is an application for a building consent only)

The following matters are involved in the project:

☐ Subdivision
☐ Alterations to land contours
☒ New or altered connections to public utilities
☒ New or altered locations and/or external dimensions of buildings
☒ New or altered access for vehicles
☐ Building work over or adjacent to any road or public place
☒ Disposal of stormwater and wastewater
☐ Building work over any existing drains or sewers or in close proximity to wells or water mains
☐ Other matters known to the applicant that may require authorisations from the territorial authority: *(specify)*

8. Building consent (this section is not applicable if this is an application for a project information memorandum only)

The following plans and specifications are attached to this application:*

Lyn Bunn Drawings
Lyn Bunn Docs
Lyn Bunn LBP Cert

The building work will comply with the building code as follows:*

Clause *(select relevant clause numbers of building code)*	**Means of compliance** *(refer to the relevant acceptable solution or verification method or detail of alternative solution in the plans and specifications)*	**Waiver/modification required** *(state nature of waiver or modification of building code required)*
☒ B1 - Structure	AS1 & VM1	
☒ B2 - Durability	AS1	
☒ C1-6 - Protection from Fire	AS1	
☒ D1 - Access Routes	AS1	
☐ D2 - Mechanical Installations for Access		
☒ E1 - Surface Water	AS1	
☒ E2 - External Moisture	AS1	
☒ E3 - Internal Moisture	AS1	
☐ F1 - Hazardous Agents on Site		
☒ F2 - Hazardous Building Materials	AS1	
☐ F3 - Hazardous Substances and Processes		
☒ F4 - Safety from Falling	AS1	
☒ F5 - Construction & Demolition Hazards	AS1	
☐ F6 - Visibility in Escape Routes		
☒ F7 - Warning Systems	AS1	
☐ F8 - Signs		
☐ F9 - Restricting access to residential pools		
☒ G1 - Personal Hygiene	AS1	
☒ G2 - Laundering	AS1	
☒ G3 - Food Prep./Prevention of Contamination	AS1	
☒ G4 - Ventilation	AS1	
☒ G5 - Interior Environment	AS1	
☐ G6 - Airborne and Impact Sound		
☒ G7 - Natural Light	AS1	
☒ G8 - Artificial Light	AS1	
☒ G9 - Electricity	AS1	
☐ G10 - Piped Services		
☐ G11 - Gas as an Energy Source		
☒ G12 - Water Supplies	AS1	
☒ G13 - Foul Water	AS1 & AS2	
☐ G14 - Industrial Liquid Waste		
☐ G15 - Solid Waste		
☒ H1 - Energy Efficiency	AS1	

9. Compliance schedule (this section is not applicable if this is an application for a project information memorandum only)

☐ **The specified systems for the building are as follows:** *(specified systems are defined in the regulations)*

☐ **The following specified systems are being altered, added to, or removed in the course of the building work:**

		Existing	New	Altered	Added	Removed
1.	Automatic systems for fire suppression (eg sprinkler systems)	☐	☐	☐	☐	☐
2.	Automatic or manual emergency warning systems for fire or other dangers	☐	☐	☐	☐	☐
3.	Electromagnetic or automatic doors or windows	☐	☐	☐	☐	☐
4.	Emergency lighting systems	☐	☐	☐	☐	☐
5.	Escape route pressurisation systems	☐	☐	☐	☐	☐
6.	Riser mains for use by fire services	☐	☐	☐	☐	☐
7.	Automatic backflow preventers connected to a potable water supply	☐	☐	☐	☐	☐
8.	Lifts, escalators, travelators or other systems for moving people or goods within buildings	☐	☐	☐	☐	☐
9.	Mechanical ventilation or air conditioning systems	☐	☐	☐	☐	☐
10.	Building maintenance units (for providing access to the exterior and interior walls of a building)	☐	☐	☐	☐	☐
11.	Laboratory fume cupboards	☐	☐	☐	☐	☐
12.	Audio loops or other assistive listening system	☐	☐	☐	☐	☐
13.	Smoke control systems	☐	☐	☐	☐	☐
14.	Emergency power systems for, or signs relating to, a specified system in 1 to 13 above.	☐	☐	☐	☐	☐
15.	Other fire safety systems or features	☐	☐	☐	☐	☐
16.	Cable cars	☐	☐	☐	☐	☐

☒ **There are no specified systems in the building.**

10. Attachments

The following documents are attached to this application:

☒ Plans and specifications* (list under section 8)
☒ Memoranda from licensed building practitioner(s) who carried out or supervised any design work that is restricted building work
☐ Project information memorandum
☐ Development contribution notice
☐ Certificate attached to project information memorandum (Form 4)
☒ Completed relevant application checksheet(s)

Please continue on the APPENDIX overleaf for further information requested by the Christchurch City Council.

Appendix

A. Additional Information

(i) Certificate for public use (section 363 Building Act) *(Commercial application only)*

Do you intend to keep the building open to the public and/or intend to open part of your building prior to the code compliance certificate being issued? *E.g. alteration to a medical centre, construction of a mixed use office/retail building*

☐ No Note: If this intention does change during your construction, a Certificate for Public Use can be applied for.

☐ Yes:
1. Details of how those parts of the building being used remain in compliance with the Building Code during construction is required.
2. Supporting documentation must be attached.

For further information in regards to Certificate for Public Use and applying for one, please refer to our website ccc.govt.nz/certificate-for-public-use/

(ii) Earthquake related work

Is this application earthquake related?

☐ No

☐ Yes

If yes, is it coordinated by an insurance company via a project management organisation (PMO), e.g. Arrow, Fletchers, etc?

☐ No

☐ Yes - name of PMO:

Does the work involve earthquake structural strengthening work?

(Applicable only for residential buildings with 2 or more stories and containing 3 or more household units; and commercial applications)

☐ No

☐ Yes

If yes, is the building currently at or above the minimum level of 34% NBS?

(if below 34% New Building Standard (NBS) defines as earthquake-prone building)

☐ No

☐ Yes

(iii) Re-cladding/Weathertight Homes Resolution Services scheme related work

Does the work involve re-cladding the building?

☐ No

☐ Yes

Is this application related to a claim under the WHRS scheme?

☐ No

☐ Yes - WHRS claim number:

Is this application related to a claim under the Financial Assistance Package scheme?

☐ No

☐ Yes

B. Development Contributions

Information required for assessment of levies under the CCC 2015 Development Contributions Policy.

(i) Residential development

The use of land or buildings for living accommodation purposes including residential units, serviced apartments and unit/strata development but excluding traveller's accommodation such as hotels, motels, hostels.

Existing:	
Number of residential units:	

New total *(Existing plus proposed)*:	
Number of residential units:	

Has a residential unit been demolished/removed from the site? ☐ Yes ☐ No Date:

The following section applies when there will be more than one residential unit on the site:

Gross floor area: m^2 Gross floor area of each unit: m^2

The following section applies where there will be two or more attached residential units on the site:

Impervious surface area*: m^2 Impervious surface area*: m^2

(ii) Non-residential development *(Commercial application only)*

The use of land or buildings for commercial premises/offices, shopping centres, supermarkets, service stations, market, bulk goods / home improvement stores, retail facilities, manufacturing industries, restaurants, warehouse/storage, commercial accommodation.

Existing:			
Impervious surface area:*	m^2		
Landscaping area:	m^2		
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Total gross floor area:	m^2		

New total *(Existing plus proposed)*:			
Impervious surface area:*	m^2		
Landscaping area:	m^2		
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Total gross floor area:	m^2		

(iii) Special assessment

If the development is one that is not recognised as a residential or non-residential land use (as above) or has a significantly greater impact than that envisaged for the land use in the Christchurch City Plan then please provide the following information for a special assessment of development levies.

Existing:	
Impervious surface area:*	m^2
Traffic movements per day:	
Litres of water usage per day:	

New total *(Existing plus proposed)*:	
Impervious surface area:*	m^2
Traffic movements per day:	
Litres of water usage per day:	

** Impervious Surface Area shall include the area of roofs, paving and gravel.*

C. Effects on existing council infrastructures and street scenes

A separate application is required for requests to alter Council's existing infrastructural assets; removal, trimming or planting of street trees, or alteration to any built structures or vegetation plots. Approval is required to use part of legal road for construction activities.

Council is responsible for managing all works on roads. Roads include unformed roads, service lanes, pedestrian walkways and alleyways. Temporary Traffic Management must be provided for all work occurred on legal roads. For further information refer to www.ccc.govt.nz or call (03) 941 8999 and discuss with an Asset Protection Officer.

It is highly unlikely that private requests will be identified in the Council's Long Term Council Community Plan; for this reason the applicant will have to fund the cost of the work. The costs may include consultations with stakeholders, together with Board or Council's decision making process if required. Other Council charges may apply, e.g. vehicle crossing inspection.

(a) **Does this property require a new water connection?**	☐ No - please provide existing water meter serial number: ☒ Yes - ☐ New Commercial *(please make a separate application on form WS1 for all commercial water connections and email to water.connections@ccc.govt.nz Application to be made at time connection is required but no later than 3 months before.)* ☒ New Residential *(please complete the sections below)*
Do you require more than one new water connection for this property? If so, how many?	*(Council policy states that only one connection per parcel of land is permitted. If you require multiple connections please supply subdivision plan and RMA number.)*
Location details:	☒ Left Hand Boundary ☐ Right Hand Boundary ☐ Corner sites: Street on which the water connection is to be installed: *(Preferred location of water connection (looking from the street). If no selection is made then Council will install your new water location in an appropriate location. Council may not always be able to place your new water connection in your chosen location.)*
Please provide contact details in case we need to contact you about your water connection:	Phone: 0274 901 323 Email: lyn390@gmail.com

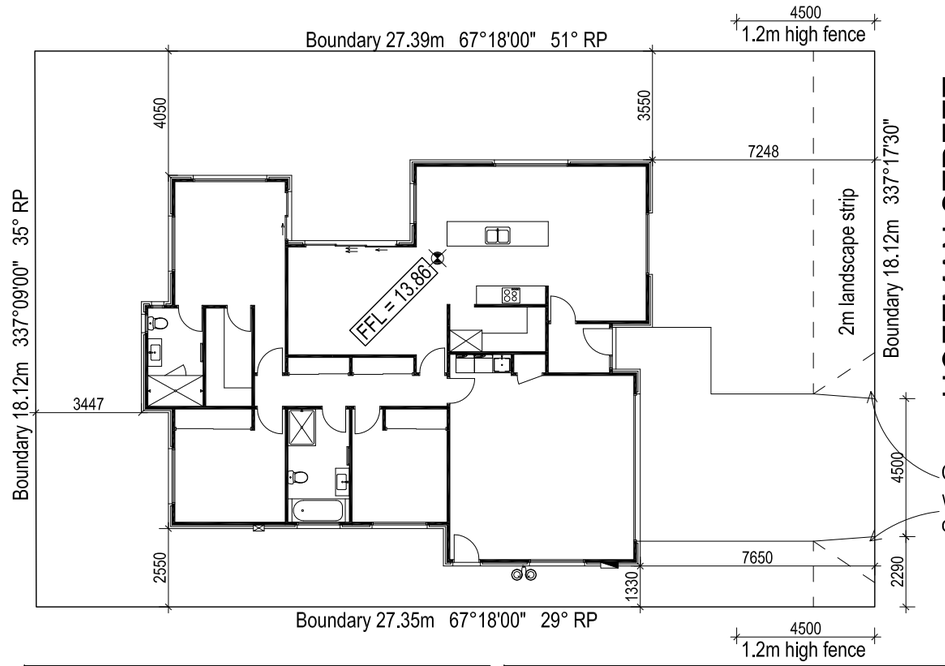
(b) **Are new or pumped connections required for:** *(New connections are where there no existing lateral provided to the property boundary from the council systems.)*	**Stormwater:** ☐ No ☒ Yes - ☒ Stormwater to kerb ☐ Stormwater to mains **Sewer:** ☐ No ☒ Yes - ☒ Foul water to mains ☐ Pumped
Do you have consent/authorisation to discharge?	☒ No ☐ Yes - please provide a copy

(c) **Is a new vehicle crossing required or an existing crossing altered for this project?** **If yes**, please complete the Vehicle Crossing Application Form.	☐ No	☒ Yes
(d) **Are any of the following items affected by the development?**	☒ No	☐ Yes
• Street furniture (bus shelter, bicycle stand, bollards, regulatory and advisory traffic sign support barriers, safety fence, retaining surface, water and waste plants, utility boxes, power poles, and/or existing objects). For electrical, gas and Telco alterations contact utility owner.	☒ No	☐ Yes
• Street trees – Trimming, removal, new planting or excavation within drip line	☒ No	☐ Yes
• Landscaped areas or berms	☒ No	☐ Yes
If yes, has Council staff been consulted, their advice given and a report prepared by them for the community board?	☒ No	☐ Yes
• Utility surface boxes – Water and waste, Telco	☒ No	☐ Yes
(e) **Is the existing pavement type (concrete, asphaltic concrete or interlocking blocks) being changed?**	☒ No	☐ Yes
(f) **Are you proposing to change the existing footpath levels?**	☒ No	☐ Yes
(g) **Are you proposing to change the existing carriageway/road levels?**	☒ No	☐ Yes
(h) **Are there existing traffic measures that would be affected/changed by the development?** *(e.g. Parking restrictions, regulatory signs, road narrowing, road, hump, platform, parking spaces, pedestrian refuge, traffic signals, texturised pavement, bus stop, speed limits, school crossing.)*	☒ No	☐ Yes

Other information and requirements are available from our website (www.ccc.govt.nz):
Public Places Bylaw 2008, Traffic and Parking Bylaw 2008, Policies on Streets Roads and Pavements, Temporary Use of Legal Road for Construction Activities Application, Water Discharge on Road Application. www.mfe.govt.nz/laws/standards/contaminants-in-soil

go ahead...

Christchurch City Council



HOFFMAN STREET

N

Lot 460
DP 549008

Hoffman Street
Prestons Park
CHRISTCHURCH

Site Coverage:

184.7m² / 495.0m² = 37.3%

Clear Visibility above 1m for a width of at least 1.5m either side of the entrance for at least 2m

Care to be taken around street trees. Protect trees while construction in progress. All contractors to be made aware. Arborist (Treetech Specialist Treecare Ltd) to be engaged to over see earthworks within 5m of any street trees.

NZBC F5: All Construction work on the building shall be performed in a manner that avoids the likelihood of:
(a) Objects falling onto people on or off the site,
(b) Objects falling on property off the site,
(c) Other hazards arising on the site affecting people off the site and other property, and
(d) Unauthorised entry of children to hazards on the site

ALLOW FOR STEPS OR LANDSCAPING TO ALL EXTERNAL DOORS SO STEP FROM FFL NO GREATER THAN 190mm (100mm min)

Anti-slip: on all access routes both internal & external, provide Anti-slip surface complying with NZBC D1/AS Table 2 (except surfaces in side Entry Doors of housing maybe considered dry areas)

SITE SAFETY
Allow for and maintain
- 2m high galv chainlink netting fencing to street front
- where side fencing not in place use same 2m high fencing
- where water hazards are present use same 2m high fencing

a . s . c . a . d . limited
ascadltd@snap.net.nz
0272 838 775

job title:
BUNN HOUSE

drawing title:
SITE PLAN
15/10/20 REV A - Notes added

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
SUBJECT TO COUNCIL APPROVAL
ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK
DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES

scale:
1:200
Job No.:
-

page:
01a
of: 22
DATE: 30/09/2020

Type 1 Smoke alarm to comply with NZBC clause F7, with Hush & Test facilities

All Lintels SG8 unless otherwise stated

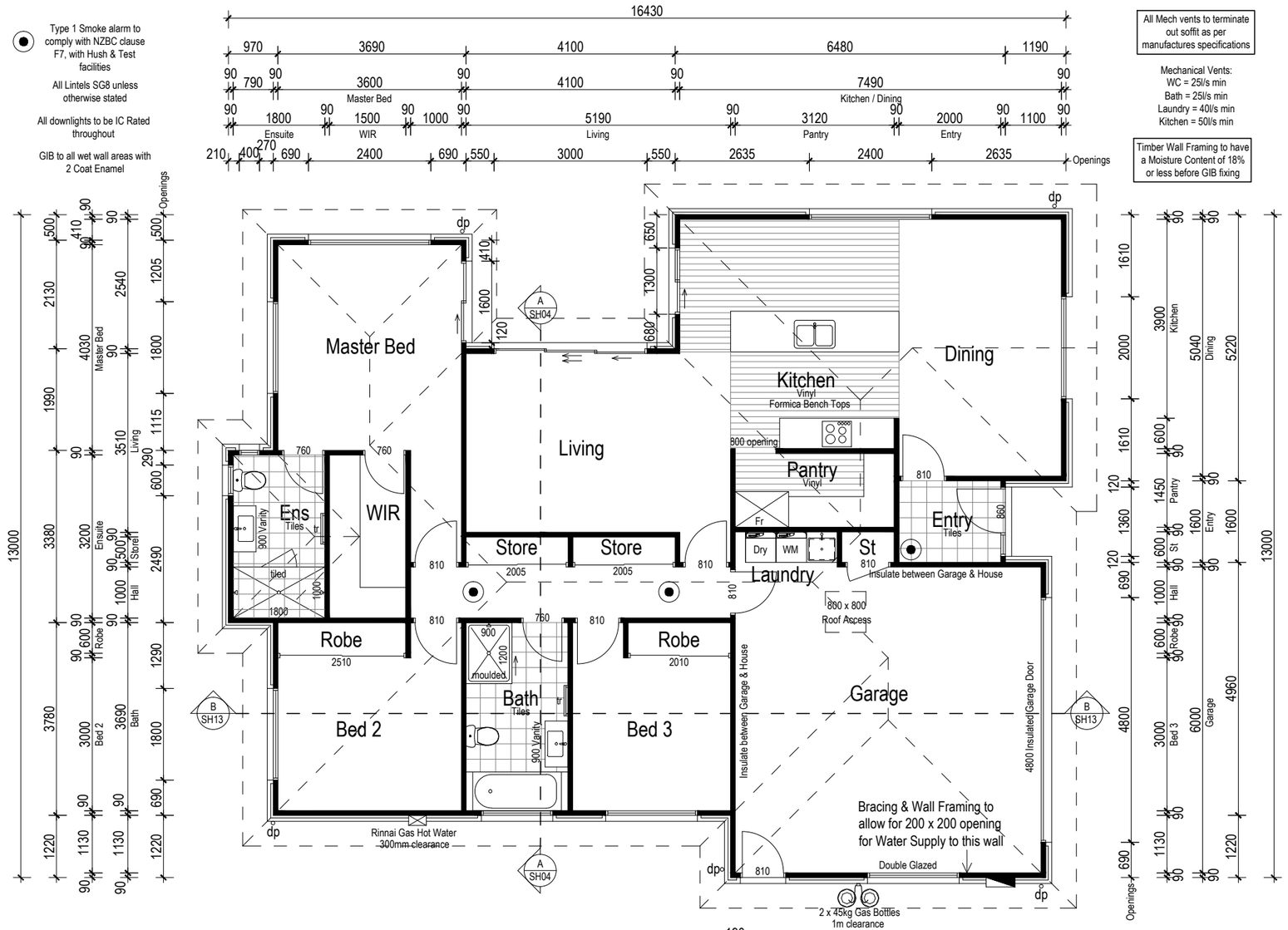
All downlights to be IC Rated throughout

GIB to all wet wall areas with 2 Coat Enamel

All Mech vents to terminate out soffit as per manufactures specifications

Mechanical Vents:
WC = 25l/s min
Bath = 25l/s min
Laundry = 40l/s min
Kitchen = 50l/s min

Timber Wall Framing to have a Moisture Content of 18% or less before GIB fixing



SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
INTERNAL WALLS
Light & Heavy Roof
Wind Zone = All

Loaded Dimension of Wall	Stud Size for Max Height of:			
	3.0m @ 600crs	3.6m @ 600crs	4.2m @ 400crs	4.8m @ 400crs
2.0	90 x 45	90 x 70	90 x 90	140 x 45
4.0	90 x 45	90 x 70	90 x 90	140 x 45
6.0	90 x 45	90 x 70	90 x 90	140 x 45

Note: Dwangs @ 800crs max

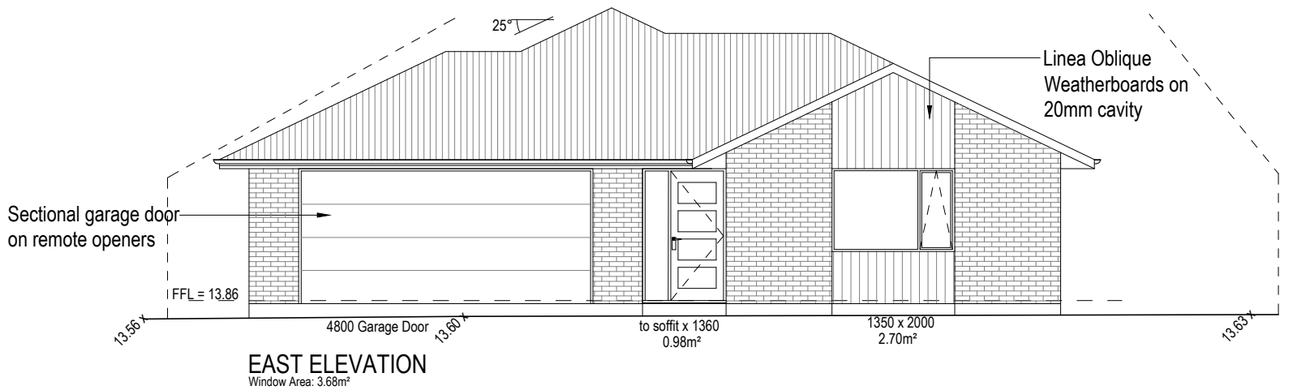
184.7m² OVER FOUNDATION

SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
Light & Heavy Roof
Wind Zone = High

Loaded Dimension of Wall	Stud Size for Max Height of:					
	2.4m @ 600crs	2.7m @ 400crs	3.0m @ 300crs	3.6m @ 300crs	4.2m @ 300crs	4.8m @ 400crs
2.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
4.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
6.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90

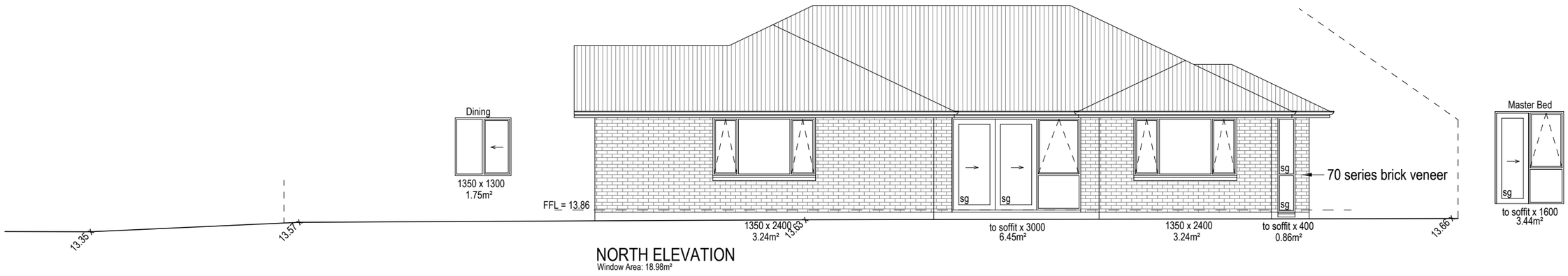
Note: Dwangs @ 800crs max

a.s.c.a.d. limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: FLOOR PLAN	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:100 Job No.: -	page: 05 of: 22 DATE: 30/09/2020



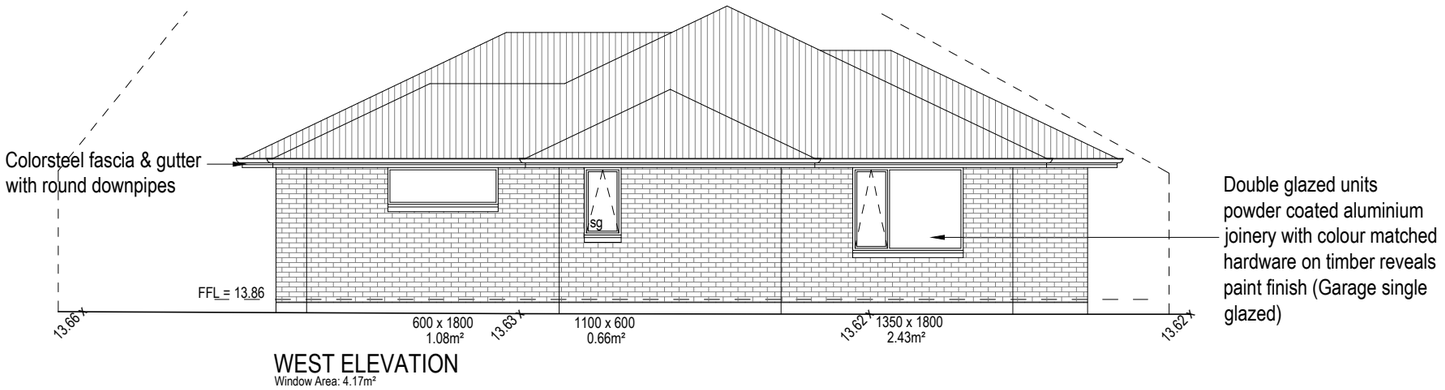
EAST ELEVATION
Window Area: 3.68m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



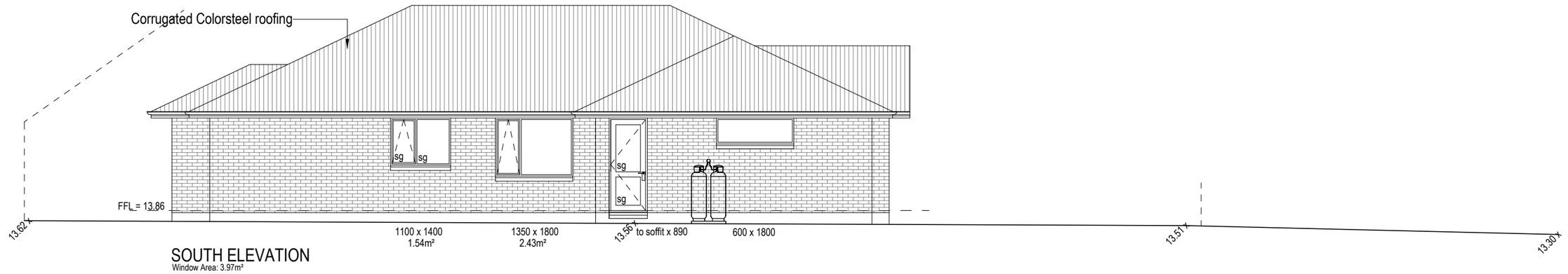
NORTH ELEVATION
Window Area: 18.98m²

a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: ELEVATIONS	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:100 Job No.: -	page: 06 of: 22 DATE: 30/09/2020



WEST ELEVATION
Window Area: 4.17m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



SOUTH ELEVATION
Window Area: 3.97m²

a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: ELEVATIONS	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:100 Job No.: -	page: 07 of: 22 DATE: 30/09/2020

Estimate of construction inspections

As at	28 October 2020
Project number	BCN/2020/10038
Description of consent	Construction of dwelling with attached garage
Site address	8 Hoffman Street Burwood Lot 460 DP 549008

There are provisions that are endorsed on the building consent in relation to inspection during the carrying out of building work. These provisions must be taken to include the provisions of Section 90, Building Act 2004.

Number of inspections allocated: 8

Inspections are required at the following stages of the building work. Please book an inspection with at least 3 working days' notice using the following inspection types. Note, depending on the extent of the building work and the order of construction some inspection types may be required on several occasions:

- **Foundation or Slab** – inspection before pour of concrete foundation footings or slab and including any sub-floor sanitary plumbing or drainage
- **Pre Roof** – inspection before the structure is enclosed, including framing, connections and membrane substrates
- **Pre Cladding** – inspection before wall cladding is installed for cladding systems not included in construction monitoring by owner's consultant
- **Half High Masonry (Half High Brick)** – inspection of cavity and ties to masonry veneer cladding
- **Pre Line (Pre Line including Plumbing)** – inspection before enclosure with linings, including insulation and plumbing in place
- **Drainage** - inspection of wastewater, stormwater or retaining wall drains before covering
- **Interior Tanking (Pre Tile Tanking)** – inspection before tiling showers and roof decks
- **Final Inspection** – inspection at completion of all building work

The fees for the above inspections have been included in the overall building consent fees up to 1 hour per inspection. Where the actual time of an inspection exceeds 1 hour then additional inspection fees will be charged. These additional inspection fees will be based on the fee per inspection and charged in 15 minute increments.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Notes

- A copy of the approved plans must be kept on site.
- **To book an inspection:**
  - Phone: **(03) 941 8222**; or
  - Online: ccc.govt.nz/bookinspection

  Please book your inspections as early as is possible to ensure that an inspector is available.
- **To change or cancel your inspection:**
  - Phone: **(03) 941 8222**

  Cancellations must be made by 4pm the working day prior to your inspection taking place. The Council charges for cancellations made on the day for when the inspection is scheduled to take place.
- Additional inspections may be necessary, depending on the nature of the building work and the manner of construction, or as a result of non-complying or incomplete work. All additional inspections are charged at the rate applicable at the time (see link below) and are invoiced separately. Unused inspections will be refunded.
- Audit inspections may also be carried out to ensure that relevant inspections by the owner's consultants have been carried out, and that a record of these inspections is kept on site.
- Further information on inspections is available on our website at ccc.govt.nz/inspections.
- You can submit construction documents via email to codecompliance@ccc.govt.nz.

Destructive investigations may be required if work is covered in prior to the Council's inspections taking place.

Building Consent Construction Documentation and Advice Notes

As at	28 October 2020
Project number	BCN/2020/10038
Description of consent	Construction of dwelling with attached garage
Site address	8 Hoffman Street Burwood Lot 460 DP 549008

Construction documentation

Under Sections 90, 94, and 45a the following construction documentation is required to be provided for the Christchurch City Council to be satisfied, on reasonable grounds, to issue the code compliance certificate. These may include third-party inspections and certifications that have provisions that are endorsed on the building consent in relation to inspection during the carrying out of building work, and must be taken to include the provisions of Section 90 of the Building Act 2004.

Energy work certificates

- **Electrical:** Provide an electrical safety certificate.
- **Gas:** Provide a gas safety certificate.

Structure: inspections

- **Construction monitoring:** Provide all records of inspections and checks carried out, and a PS4 from your nominated structural consultant **ENGCO** stating that all the necessary aspects of their design has been incorporated into the building. This includes but is not limited to the following work:
  - Site Strip
  - Ribraft Slab pre-pour

Restricted Building Work

- **Restricted Building Work - Brick and block laying:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Carpentry:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Foundation:** Provide Record(s) of Work on regulated form 6A.
- **Restricted Building Work - Roofing:** Provide Record(s) of Work on regulated form 6A.

Construction statements

- **Under tile shower or deck tanking/waterproof membrane:** Provide a PS3 from your nominated contractor.

Test reports and/or "as-builts"

- **As-built truss layout:** Provide as-built truss plan and layout at time of pre roof inspection.
- **Water reticulation - pipework testing:** Provide completed form B-084.
- **Foulwater and stormwater drains layouts:** Provide as-laid drainage plan at time of drainage inspection.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Advice notes

Please read and follow the advice notes listed below. Failure to do so may create difficulties in obtaining a code compliance certificate.

- All building work must be carried out in accordance with the approved building consent documents. A full and current copy of the stamped documents must remain on site for reference at all times. This may include approved documents in digital format presented on an electronic device provided they are easily readable. For example documents presented on a smart phone screen would not be considered easily readable.
- A building consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the building consent. A building consent authority may allow a further period if an extension of time to start work is requested.
- An owner must apply for a code compliance certificate as soon as practicable after all building work to be carried out under a building consent is completed. If after two years there has been no application for a code compliance certificate, under Section 93(2)(b), a building consent authority, must decide whether it can issue a code compliance certificate. Council may need to carry out a building inspection to assist with this decision or extend its time to make this decision. At this time we will also invoice any accrued fees associated with the building work.
- If you wish to make changes to your building consent, you must apply for an amendment or a minor variation. An amendment or a minor variation must be granted before the building work is carried out. Refer to www.ccc.govt.nz/consents-and-licences/building-consents/building-consent/change-your-building-consent.
- **Subdivision not completed:** As the building is being built on a subdivision that has yet to be completed, *unless* a Certificate under Section 224 of the Resource Management Act is issued first, verification that the sewer, stormwater, and water supply systems in the subdivision are fully operational and complying is required before connection to these systems may occur. This approval must be from the Council's Subdivision Engineers.
- **Prevention of dust and debris:** An adequate supply of water shall be available at all times to enable the site and truck loads to be dampened down to prevent dust and debris being deposited on the footpath, roadway and adjoining properties. The footpath and roadway are to be kept clean using methods that minimise sediment from entering the stormwater system and waterways.
- **Management plan for the control of stormwater and sediment:** The management plan for the control of stormwater and sediment during construction must be made known to the building contractor before any siteworks are carried out. Failure to comply with the management plan may lead to enforcement action being taken under the Building Act 2004.
- **Site Safety:** Ensure all appropriate site safety measures are provided throughout the contract works to comply with NZ Building Code Clause F5 and all Occupational Safety and Health requirements.
- **Building Location:** The site location of the dwelling will be verified by a Council inspector during their first inspection. If the location cannot be established or is not in accordance with the consented documents, it is the responsibility of the applicant to verify compliance, registered professional surveyor or a licenced cadastral surveyor may need to provide verification of compliance, by providing a Building Location Certificate. The applicant is responsible for remedying an incorrectly located building and for the associated costs.

Building Consent

Section 51, Building Act 2004 *Form 5 – Building (Forms) Regulations 2004*

Building consent number	BCN/2020/10038	**Date issued**	28 October 2020

The building

Street address of building	8 Hoffman Street Burwood	**Location of building within site/block number**	
Legal description of land where building is located	Lot 460 DP 549008		
Building name		**Level/unit number**	

The owner

Name of owner	L C Bunn	**Phone number**	
Contact person		**Landline**	
Mailing address	[redacted]		
Street address/ registered office			
Email address			

First point of contact for communications with the building consent authority:

Name	A.S.C.A.D Limited	**Phone**	(03) 329 2092
Contact person	Andrew Siegenthaler	**Mobile**	
Mailing address	59 Warwick Road, RD5, Rangiora 7475	**Fax**	
		Email address	ascadltd@snap.net.nz

Building work

The following building work is authorised by this building consent:

Construction of dwelling with attached garage

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or any responsibility under any other Act relating to or affecting the building (or proposed building). This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Conditions of consent

This building consent is subject to the following conditions:

Under section 90 of the Building Act 2004, agents authorised by the Council (acting as a building consent authority) are entitled, at all times during normal working hours or while building work is being done, to inspect:

- land on which building work is being or is proposed to be carried out; and
- building work that has been or is being carried out on or off that building site; and
- any building.

Compliance schedule

A compliance schedule is not required for the building.

Attachments

Copies of the following documents are attached to this building consent:

- Project information memorandum (PIM)
- Estimate of construction inspections (by Christchurch City Council)
- Building consent construction documentation (including third party certification) and advice notes
- PIM drainage plans
- Approved plans
- Approved specifications
- Approved supporting documents

Cate McPherson

Building Control Officer
03 941 7009

On behalf of: Christchurch City Council
Date: 28 October 2020

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

29 October 2020

CDL Land New Zealand Limited
c/-L C Bunn
[redacted]

Dear Lynley

We are pleased to let you know that your building consent application is granted

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

Please be aware that we are not required to issue the consent until we receive payment of the building consenting fees. Also note that building work must not start until we have granted and issued the building consent and you have the approved consent documents.

We have included an invoice for our work on this application.

How to pay:

You can use internet banking to pay this fee. Please note that all payments will be credited to our account on the next business day. Payments made without the particulars, code and reference details may take longer to be lodged against the correct account. Our details are:

Bank	Bank of New Zealand
Account name	Christchurch City Council
Account number	02 0800 0044765 03

The information that you need to enter that will help us identify your payment is:

Particulars	194038
Code	10-337006
Reference	1665255

If you would like your consent issued sooner, you can send us a screenshot or snip image of your payment transaction. If you are paying more than one invoice, please send remittance advice to **payments@ccc.govt.nz.**

Yours sincerely

L S. Daniell

Lynette Daniell
Building Support Officer
03 941 5089

Tax Invoice

GST number 53-198-554

CDL Land New Zealand Limited
c/-L C Bunn
[redacted]

Invoice number **194038**
Invoice date 29 October 2020
Customer number 3139218

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood
Owner	CDL Land New Zealand Limited
Invoiced to date	$2,800.00

Description	GST	Amount (GST incl.)
Development check	$50.07	$383.90
Accept	$5.17	$39.60
Process and grant	$167.53	$1,284.40
Inspection residential	$208.70	$1,600.00
CCC Grant and issue dwelling	$46.96	$360.00
Accreditation levy	$19.72	$151.20
Building levy (MBIE)	$86.28	$661.50
Building research levy (BRANZ)	$0.00	$378.00
Standard water connection	$136.27	$1,044.75
Vehicle crossing inspection	$20.35	$156.00
Electronic file management	$6.78	$52.00
Pre-acceptance technical review	$19.49	$149.40
Less minimum application fee already paid	-$365.22	-$2,800.00
	$402.10	**$3,460.75**

These fees are due within 30 days from the date of this invoice. Please ensure payment is made by the due date.
Where the Council has issued an invoice for the payment of any fee or charge under this section and the amount invoiced has not been paid by the stated due date, the Council may commence debt recovery action. The Council reserves the right to charge interest, payable from the date the debt became due, and recover costs incurred in pursuing recovery of the debt on a solicitor / client basis as outlined in the Fees and Charges Schedule of the Council's Long Term Plan.

To pay by Internet banking, use the following details:

Account	**02 0800 0044765 03**
Particulars	**194038**
Code	**10-337006**
Reference	**1665255**

Send remittance advice to payments@ccc.govt.nz.

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Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Balance to be paid	**$3,460.75**
	(GST inclusive)

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

29 October 2020

L C Bunn

[redacted]

Dear Lynley

We are pleased to let you know that your building consent application is granted

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

Please be aware that we are not required to issue the consent until we receive payment of the building consenting fees. Also note that building work must not start until we have granted and issued the building consent and you have the approved consent documents.

We have included an invoice for our work on this application.

How to pay:

You can use internet banking to pay this fee. Please note that all payments will be credited to our account on the next business day. Payments made without the particulars, code and reference details may take longer to be lodged against the correct account. Our details are:

Bank	Bank of New Zealand
Account name	Christchurch City Council
Account number	02 0800 0044765 03

The information that you need to enter that will help us identify your payment is:

Particulars	194038
Code	10-337006
Reference	1665255

If you would like your consent issued sooner, you can send us a screenshot or snip image of your payment transaction. If you are paying more than one invoice, please send remittance advice to payments@ccc.govt.nz.

Yours sincerely

L S. Daniell

Lynette Daniell
Building Support Officer
03 941 5089

Tax Invoice

GST number 53-198-554

L C Bunn

[redacted]

Invoice number	194038
Invoice date	29 October 2020
Customer number	3139218

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood
Owner	CDL Land New Zealand Limited
Invoiced to date	$2,800.00

Description	GST	Amount (GST incl.)
Development check	$50.07	$383.90
Accept	$5.17	$39.60
Process and grant	$167.53	$1,284.40
Inspection residential	$208.70	$1,600.00
CCC Grant and issue dwelling	$46.96	$360.00
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Standard water connection	$136.27	$1,044.75
Vehicle crossing inspection	$20.35	$156.00
Electronic file management	$6.78	$52.00
Pre-acceptance technical review	$19.49	$149.40
Less minimum application fee already paid	-$365.22	-$2,800.00
	$402.10	$3,460.75

Balance to be paid **$3,460.75**

(GST inclusive)

These fees are due within 30 days from the date of this invoice. Please ensure payment is made by the due date.
Where the Council has issued an invoice for the payment of any fee or charge under this section and the amount invoiced has not been paid by the stated due date, the Council may commence debt recovery action. The Council reserves the right to charge interest, payable from the date the debt became due, and recover costs incurred in pursuing recovery of the debt on a solicitor / client basis as outlined in the Fees and Charges Schedule of the Council's Long Term Plan.

To pay by Internet banking, use the following details:

Account	02 0800 0044765 03
Particulars	194038
Code	10-337006
Reference	1665255

Send remittance advice to payments@ccc.govt.nz.

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Civic Offices, 53 Hereford Street, Christchurch 8011
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www.ccc.govt.nz

Consent Fee Summary (Building Consent)

Christchurch City Council

Consent Reference Number:	BCN/2020/10038	Consent Address:	8 Hoffman Street Burwood

B103 LU: 09.09.20 LR: 09.09.20 v31

Accept:						
Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Lodging		Faye Arona	02/Oct/2020	0.33	$120.00	$39.60
					Total Fee:	$39.60

PIM/Development Check:						
Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Building (Hazards) Check		Ed Nystad	02/Oct/2020	0.33	$275.00	$90.75
Drainage Report		Heath Wells	05/Oct/2020	0.3	$275.00	$82.50
Planning Check		Stacey Jung	14/Oct/2020	0.58	$155.00	$89.90
Planning Check		Stacey Jung	15/Oct/2020	0.33	$155.00	$51.15
PIM Administration		Stephen Burrows	14/Oct/2020	0.33	$120.00	$39.60
PIM Coordinator Sign-off					Applicable	$30.00
					Total Fee:	$383.90

Pre-acceptance Technical Review:						
Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Pre-acceptance technical review		Claudia Stuart	02/Oct/2020	0.83	$180.00	$149.40
					Total Fee:	$149.40

Process and Grant:						
Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Processing		Catherine McPherson	21/Oct/2020	3.5	$210.00	$735.00
RFI Processing		Catherine McPherson	28/Oct/2020	1	$210.00	$210.00
End Administration		Lynette Daniell	29/Oct/2020	1	$120.00	$120.00
			Issuing Consent:		Applicable	$30.00
			Fixed Administration Fee:		Applicable	$175.00
			Certificate of Title:	1	Applicable	$14.40
			External Contractors or Consultants:		Not Applicable	$0.00
					Total Fee:	$1,284.40

Levies:			
Original Value of Work:	$378,000.00		
Amendment Value Of Work	$0.00		
Accreditation Levy:	$151.20	($0.40 for every $1,000 of estimated value)	
Building Levy (MBIE):	$661.50	($1.75 per $1,000 (or part thereof) of building work valued at $20,444 or more)	
Building Research Levy (BRANZ):	$378.00	($1 per $1,000 (or part thereof) of building work valued at $20,000 or more)	
		Total Fee:	$1,190.70

Inspections:				
Type:	Comments:	Number of Inspections:	Cost Per Inspection:	Fee:
Residential		8	$200.00	$1,600.00
			Total Fee:	$1,600.00

Christchurch City Council Fees:				
Fee Type:		Total Quantity:	Rate Per Quantity	Fee:
Code Compliance Certificate	Residential new dwelling	1	$360.00	$360.00
Electronic File Management Fee	Applicable			$52.00
Vehicle Crossing Inspection:		1	$156.00	$156.00
Standard Water Connection:		1	$1,044.75	$1,044.75
No Additional Fees				$0.00
			Total Fee:	$1,612.75

Subtotal (inc GST):	$6,260.75
Less Deposit Paid (inc GST):	$2,800.00
Final Total Invoice (inc GST):	**$3,460.75**

Credit Note

GST number 53-198-554

Christchurch City Council

CDL Land New Zealand Limited
c/-L C Bunn
[redacted]

Credit number	**557334**
Issue date	29 October 2020
Customer number	Debtor 33700

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood

Description	**GST**	**Amount (GST incl.)**
Credit on Vehicle crossing inspection	-$20.35	-$156.00
	-$20.35	**-$156.00**

Total **-$156.00**

(GST inclusive)

Please do not pay on this credit note.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Credit Note

GST number 53-198-554

Christchurch City Council

CDL Land New Zealand Limited
c/-L C Bunn
[redacted]

Credit number	**557334**
Issue date	29 October 2020
Customer number	Debtor 33700

Application number	BCN/2020/10038
Property address	8 Hoffman Street Burwood

Description	GST	Amount (GST incl.)
Credit on Vehicle crossing inspection	-$20.35	-$156.00
	-$20.35	**-$156.00**

Total **-$156.00**

(GST inclusive)

Please do not pay on this credit note.

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: (03) 941-8999, Fax: (03) 941-8792
www.ccc.govt.nz

Consent Fee Summary (Building Consent)

Christchurch City Council

Consent Reference Number:	BCN/2020/10038	Consent Address:	8 Hoffman Street Burwood

B103 LU: 09.09.20 LR: 09.09.20 v31

Accept:

Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Lodging		Faye Arona	02/Oct/2020	0.33	$120.00	$39.60
					Total Fee:	$39.60

PIM/Development Check:

Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Building (Hazards) Check		Ed Nystad	02/Oct/2020	0.33	$275.00	$90.75
Drainage Report		Heath Wells	05/Oct/2020	0.3	$275.00	$82.50
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Planning Check		Stacey Jung	15/Oct/2020	0.33	$155.00	$51.15
PIM Administration		Stephen Burrows	14/Oct/2020	0.33	$120.00	$39.60
PIM Coordinator Sign-off					Applicable	$30.00
					Total Fee:	$383.90

Pre-acceptance Technical Review:

Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Pre-acceptance technical review		Claudia Stuart	02/Oct/2020	0.83	$180.00	$149.40
					Total Fee:	$149.40

Process and Grant:

Type:	Comments:	Officer Name:	Date:	Hours Worked:	Rate Per Hour:	Fee:
Processing		Catherine McPherson	21/Oct/2020	3.5	$210.00	$735.00
RFI Processing		Catherine McPherson	28/Oct/2020	1	$210.00	$210.00
End Administration		Lynette Daniell	29/Oct/2020	1	$120.00	$120.00
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			Fixed Administration Fee:		Applicable	$175.00
			Certificate of Title:	1	Applicable	$14.40
			External Contractors or Consultants:		Not Applicable	$0.00
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Original Value of Work:	$378,000.00		
Amendment Value Of Work	$0.00		
Accreditation Levy:	$151.20	($0.40 for every $1,000 of estimated value)	
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		Total Fee:	$1,190.70

Inspections:

Type:	Comments:	Number of Inspections:	Cost Per Inspection:	Fee:
Residential		8	$200.00	$1,600.00
			Total Fee:	$1,600.00

Christchurch City Council Fees:

Fee Type:		Total Quantity:	Rate Per Quantity	Fee:
Code Compliance Certificate	Residential new dwelling	1	$360.00	$360.00
Electronic File Management Fee	Applicable			$52.00
Standard Water Connection:		1	$1,044.75	$1,044.75
No Additional Fees				$0.00
			Total Fee:	$1,456.75

Subtotal (inc GST):	$6,104.75
Less Deposit Paid (inc GST):	$2,800.00
Final Total Invoice (inc GST):	**$3,304.75**

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

29 October 2020

A.S.C.A.D Limited
26 Salecia Gardens
Christchurch 8083

Dear Sir/Madam

Your building consent is now issued

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

We are pleased to tell you that your building consent is now issued.

You can now download your approved documents from **onlineservices.ccc.govt.nz**. You may need to register first (this is free).

The files to download consist of the following:

- Building consent
- Project information memorandum (PIM)
- Estimate of construction inspections (by Christchurch City Council)
- Building consent construction documentation (including third party certification) and advice notes
- PIM drainage plans
- Approved plans
- Approved specifications
- Approved supporting documents

If you need to talk to us you can call me on the number below, or if you need help downloading your documents, please email **onlineservices@ccc.govt.nz**.

Yours sincerely

L S. Daniell

Lynette Daniell
Building Support Officer
03 941 5089

B-531 LU 101218 LR 101218 v4

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

29 October 2020

A.S.C.A.D Limited
26 Salecia Gardens
Christchurch 8083

Dear Sir/Madam

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BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

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- Approved plans
- Approved specifications
- Approved supporting documents

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Yours sincerely

L S. Daniell

Lynette Daniell
Building Support Officer
03 941 5089

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **251 - Foundation or Slab**
Inspection Outcome: **Pass**
Inspected By: **Glenn Mackle**
Inspection Date: **10 November 2020 4:36 p.m.**
Duration: **60 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Note: Site was unattended during inspection.**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue once directives have been completed.**	NoStatus
Next inspection required: **252 - Drainage or** **217 - Pre Roof**	NoStatus
Summary of inspection undertaken: **TC1 Waffle foundation/floor raft construction completed as in consent plans/details** **Floor drainage/plumbing completed** **Eng has inspected and approved completed works - report viewed on site** **Approval to pour concrete**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **1st inspection for consented works**	N/A
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
Engineer involvement: **Engineers report is available onsite - approved to proceed at direction of engineer.**	Pass
Sediment control: **Sediment control has been achieved at this inspection.**	Pass
FOUNDATION	Pass
Building Location: **Building location confirmed by council inspector. Building appears in correct orientation and location as per consented plans.**	Pass
Foundation Type: **Specific Engineer Design (SED)**	Pass

TC1 Waffle foundation/floor raft construction

Layout: Pass
Layout is as per consented design.

Bearing: Pass
Verified by: Engineer

Excavation: Pass
Consented trench dimensions have been verified.

Reinforcement: Pass
Verified by: Engineer (SED)
Steel size & spacing: 3x hd12 to perimeter beam, 1x hd12 to central ribs
Steel has been adequately lapped and tied.
Mesh Size (SED foundation):Se62

Durability: Pass
DPM installed and adequately lapped.
DPM type:25mu polythene dpm to all floor areas
50mm clearance from DPM or boxing face achieved.

Rebates: Pass
Door rebates installed.
Brick/cladding rebates installed.
Shower rebated installed.

FLOOR SLAB Pass

Reinforcement: Pass
Mesh size: SE62
SED floor slab
Mesh has been adequately lapped and tied.

Slab thickening or point loads: Pass
Load bearing walls located over grade beams as per SED foundation.

Concrete thickness: Pass
Minimum concrete thickness has been achieved.

Underfloor insulation: Pass
Insulation provided by 220 eps pods for waffle raft foundation/floor construction

Durability: Pass
DPM installed and adequately lapped.
DPM type:25mu polythene dpm to all floor areas
50mm clearance from DPM or boxing face achieved.

Rebates: Pass
Door rebates installed.
Brick/cladding rebates installed.
Shower rebated installed.

DRAINAGE Pass

System used: Pass
G13

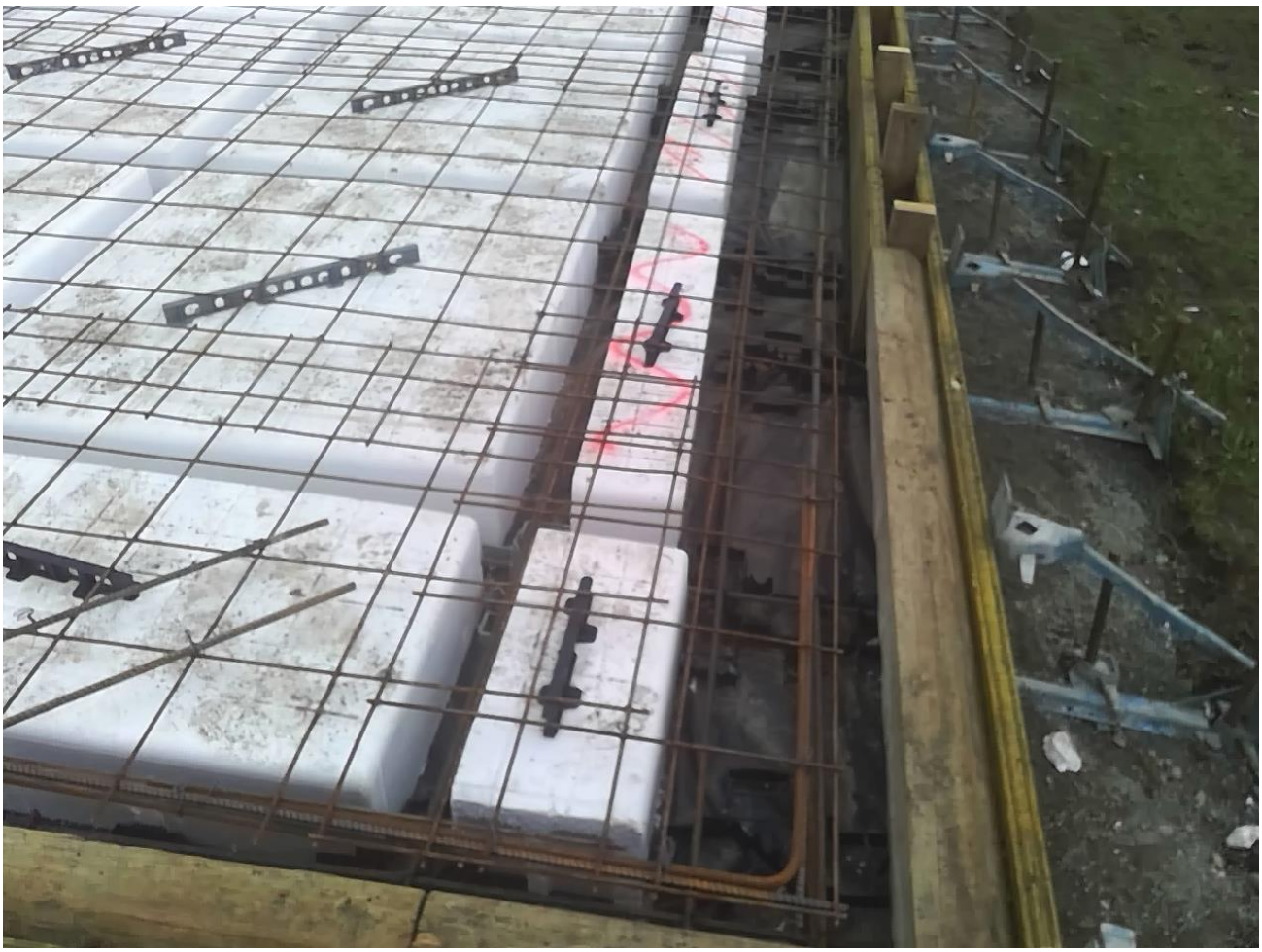
Pipe work: Pass
Pipe work size is correct as per specified system and consented documentation.
Pipe work is located as per consented documentation.
Pipe work is adequately supported and protected where passing through concrete.

Venting: N/A

Other services: N/A

east ele

Taken at 4:12 PM on Tuesday 10/11/2020 Status: Pass



Taken at 4:12 PM on Tuesday 10/11/2020 Status: Pass

all services foam sleeved

Taken at 4:13 PM on Tuesday 10/11/2020 Status: Pass

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No: **202010038** Date Printed: **10 November 2020**

Applicant: **Lynley Claire Bunn**

Site Address: **8 Hoffman Street Burwood**

Legal Description: **Lot 460 DP 549008**

Work Type: **Construction of dwelling with attached garage**

Email To: **ascadltd@snap.net.nz,dave@rocksolidfoundations.co.nz,ly**[redacted]

Inspection Type: **251 - Foundation or Slab**

Inspection Outcome: **Pass**

Inspected By: **Glenn Mackle**

Inspection Date: **10 November 2020**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Note: Site was unattended during inspection.**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue once directives have been completed.**
Next inspection required:	**252 - Drainage or** **217 - Pre Roof**
Summary of inspection undertaken:	**TC1 Waffle foundation/floor raft construction completed as in consent plans/details** **Floor drainage/plumbing completed** **Eng has inspected and approved completed works - report viewed on site** **Approval to pour concrete**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
Engineer involvement:	**Engineers report is available onsite - approved to proceed at direction of engineer.**
Sediment control:	**Sediment control has been achieved at this inspection.**

FOUNDATION

Building Location:	**Building location confirmed by council inspector.** **Building appears in correct orientation and location as per consented plans.**
Foundation Type:	**Specific Engineer Design (SED)** **TC1 Waffle foundation/floor raft construction**

Layout:	**Layout is as per consented design.**
Bearing:	**Verified by: Engineer**
Excavation:	**Consented trench dimensions have been verified.**
Reinforcement:	**Verified by: Engineer (SED)** **Steel size & spacing: 3x hd12 to perimeter beam, 1x hd12 to central ribs** **Steel has been adequately lapped and tied.** **Mesh Size (SED foundation):Se62**
Durability:	**DPM installed and adequately lapped.** **DPM type:25mu polythene dpm to all floor areas** **50mm clearance from DPM or boxing face achieved.**
Rebates:	**Door rebates installed.** **Brick/cladding rebates installed.** **Shower rebated installed.**

FLOOR SLAB

Reinforcement:	**Mesh size: SE62** **SED floor slab** **Mesh has been adequately lapped and tied.**
Slab thickening or point loads:	**Load bearing walls located over grade beams as per SED foundation.**
Concrete thickness:	**Minimum concrete thickness has been achieved.**
Underfloor insulation:	**Insulation provided by 220 eps pods for waffle raft foundation/floor construction**
Durability:	**DPM installed and adequately lapped.** **DPM type:25mu polythene dpm to all floor areas** **50mm clearance from DPM or boxing face achieved.**
Rebates:	**Door rebates installed.** **Brick/cladding rebates installed.** **Shower rebated installed.**

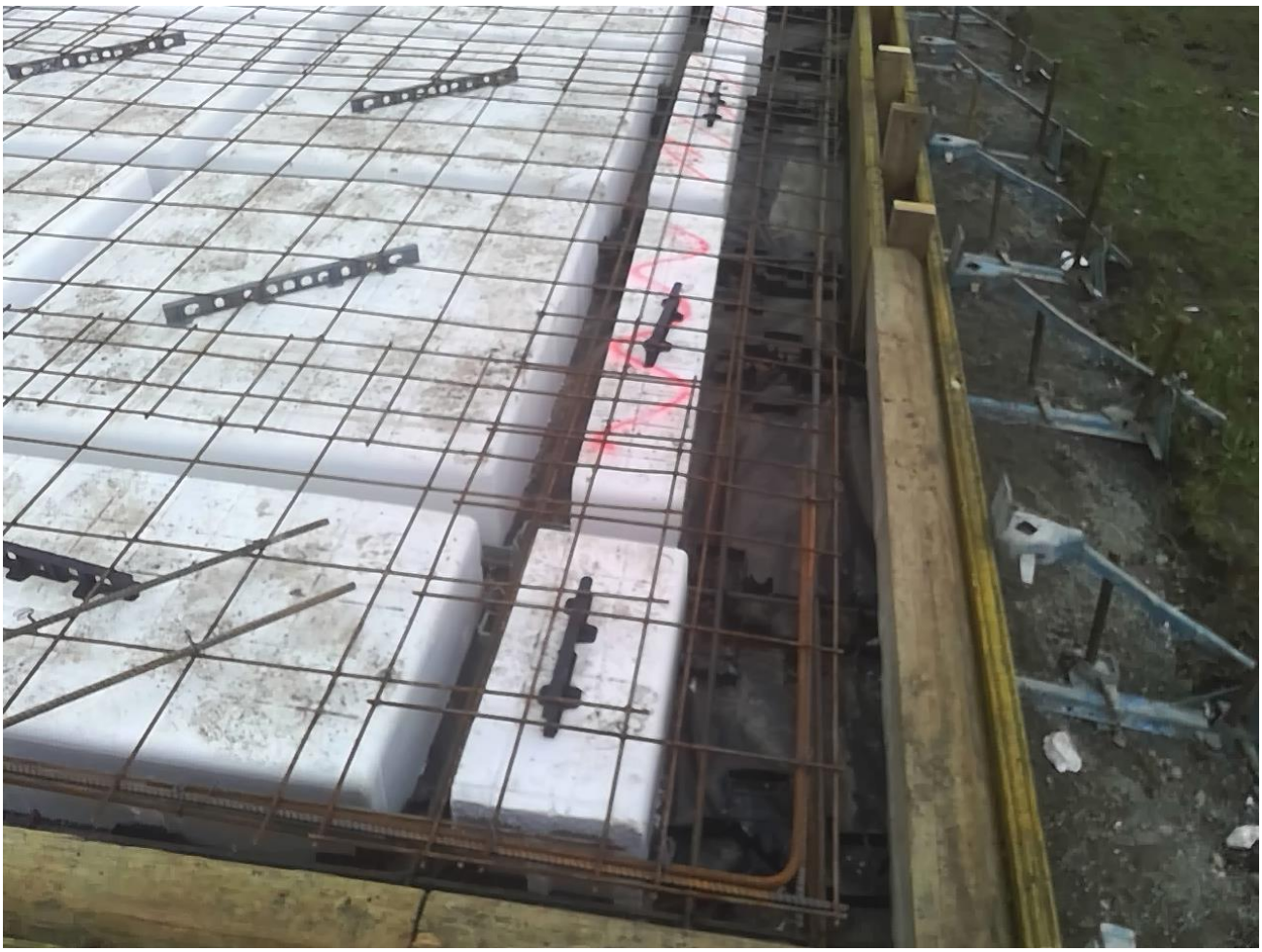
DRAINAGE

System used:	**G13**
Pipe work:	**Pipe work size is correct as per specified system and consented documentation.** **Pipe work is located as per consented documentation.** **Pipe work is adequately supported and protected where passing through concrete.**

Support Documentation	Status
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

east ele

Taken at 4:12 PM on Tuesday 10/11/2020 Status: Pass



Taken at 4:12 PM on Tuesday 10/11/2020 Status: Pass

all services foam sleeved
Taken at 4:13 PM on Tuesday 10/11/2020 Status: Pass

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **252 - Drainage**
Inspection Outcome: **Pass**
Inspected By: **Glenn Mackle**
Inspection Date: **16 November 2020 12:08 p.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **LBP Contact: drainlayer** **Full Name: Michael Boulton** **Phone #: 0276305726** **re no 29791** **LBP Type:drainage**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **Pre Roof**	NoStatus
Summary of inspection undertaken: **Bubble Up Sump installed near property frontage connected to kerb** **S/S and S/W completed** **As Built for drainage layout photographed** **Approval to backfill**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
As-built drainage plan: **Complete and on site. (Photographed)**	Pass
Drainlayer's Registration: **Full Name: Michael Boulton** **Phone #: 0276305726** **re no 29791**	Pass
Sediment control:	Pass

Sediment control has been achieved at this inspection.

FOULWATER	Pass
System Used: **G13/AS2**	Pass
Drain material: **PVC**	Pass
Gradient: **1:60**	Pass
Drain depth at boundary: **Depth:1.2m**	Pass
Granular bedding: **13mm Chip**	Pass
Inspection fittings: **Installed where required.**	Pass
Drain test: **Water**	Pass
ORG: **Location:ORG installed to drainage on west ele**	Pass
Connection to Council drain: **Existing Lateral**	Pass
Inspection chamber/manhole haunched:	N/A
Specific System:	N/A
Drain vent: **Provision for 80mm MV made near top of SS lateral on south ele**	Pass
Main drain diameter: **Size: 100mm**	Pass
STORMWATER	Pass
System Used: **E1/AS1**	Pass
Drain material: **PVC**	Pass
Gradient: **1:100**	Pass
Drain depth at boundary: **Depth:300mm**	Pass
Granular bedding: **13mm Chip**	Pass
Inspection fittings: **Installed where required.**	Pass
Drain test:	N/A
Connection Type: **Connection to Council Kerb**	Pass
Specific System:	N/A
Main drain diameter: **Size: 100mm**	Pass
Sumps & Silt Traps: **Location of bubble up sump(s): to east front boundary area**	Pass
RETAINING WALL DRAINAGE	N/A

bubbleup connected to kerb
Taken at 11:59 AM on Monday 16/11/2020 Status: Pass

drainage to South ele
Taken at 12:00 PM on Monday 16/11/2020 Status: Pass

drainage to west ele

Taken at 12:01 PM on Monday 16/11/2020 Status: Pass

drainage to north ele

Taken at 12:02 PM on Monday 16/11/2020 Status: Pass

Taken at 12:03 PM on Monday 16/11/2020 Status: Pass

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No: **202010038** Date Printed: **16 November 2020**

Applicant: **Lynley Claire Bunn**

Site Address: **8 Hoffman Street Burwood**

Legal Description: **Lot 460 DP 549008**

Work Type: **Construction of dwelling with attached garage**

Email To: **ascadltd@snap.net.nz,dandbdrainage@gmail.com**[redacted]

Inspection Type: **252 - Drainage**

Inspection Outcome: **Pass**

Inspected By: **Glenn Mackle**

Inspection Date: **16 November 2020**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**LBP Contact: drainlayer** **Full Name: Michael Boulton** **Phone #: 0276305726** **re no 29791** **LBP Type:drainage**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**Pre Roof**
Summary of inspection undertaken:	**Bubble Up Sump installed near property frontage connected to kerb** **S/S and S/W completed** **As Built for drainage layout photographed** **Approval to backfill**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
As-built drainage plan:	**Complete and on site. (Photographed)**
Drainlayer's Registration:	**Full Name: Michael Boulton** **Phone #: 0276305726** **re no 29791**
Sediment control:	**Sediment control has been achieved at this inspection.**

FOULWATER

System Used:	**G13/AS2**
Drain material:	**PVC**
Gradient:	**1:60**
Drain depth at boundary:	**Depth:1.2m**
Granular bedding:	**13mm Chip**
Inspection fittings:	**Installed where required.**
Drain test:	**Water**
ORG:	**Location:ORG installed to drainage on west ele**
Connection to Council drain:	**Existing Lateral**
Drain vent:	**Provision for 80mm MV made near top of SS lateral on south ele**
Main drain diameter:	**Size: 100mm**

STORMWATER

System Used:	**E1/AS1**
Drain material:	**PVC**
Gradient:	**1:100**
Drain depth at boundary:	**Depth:300mm**
Granular bedding:	**13mm Chip**
Inspection fittings:	**Installed where required.**
Connection Type:	**Connection to Council Kerb**
Main drain diameter:	**Size: 100mm**
Sumps & Silt Traps:	**Location of bubble up sump(s): to east front boundary area**

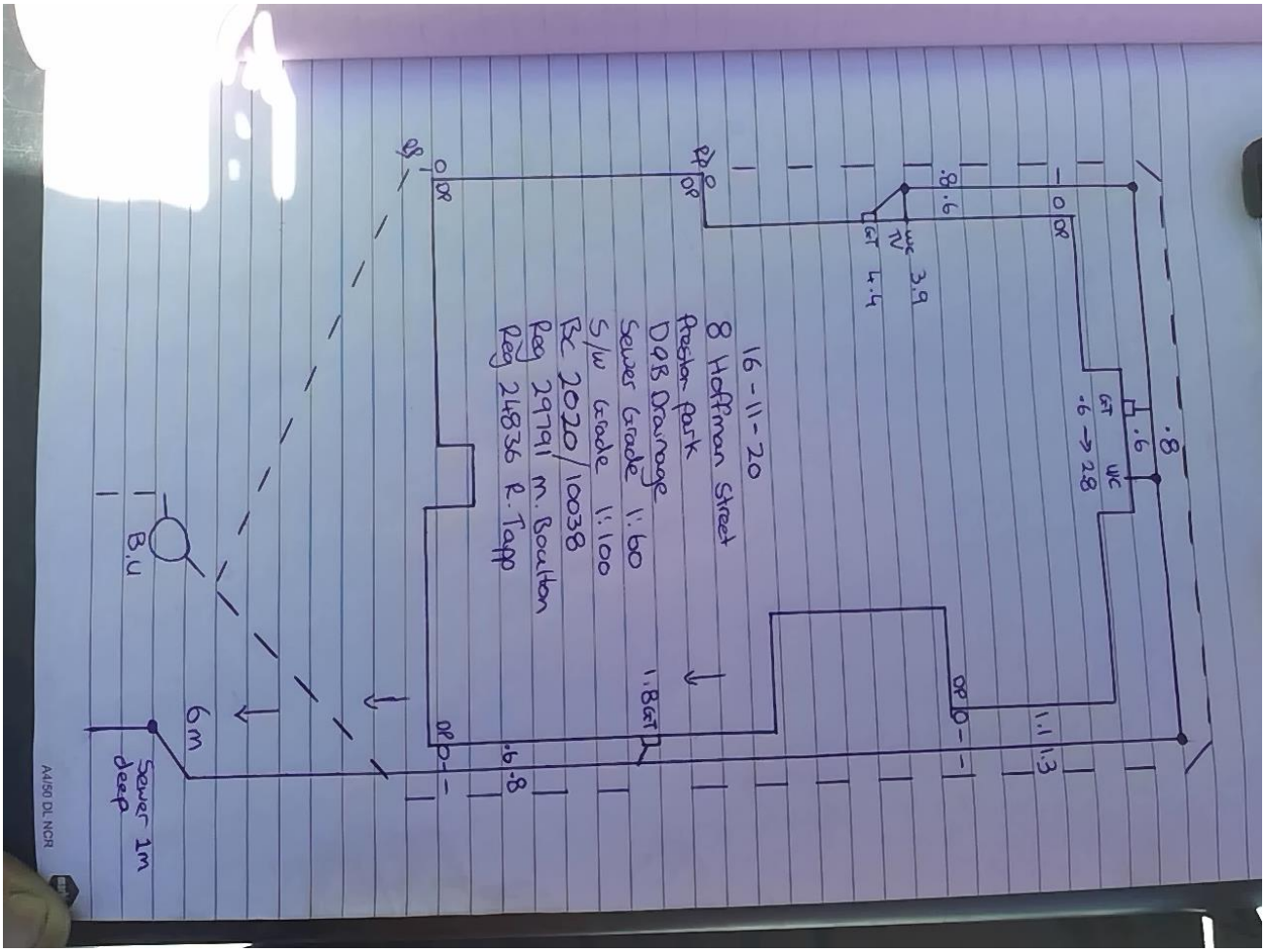
Support Documentation	Status
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

bubbleup connected to kerb
Taken at 11:59 AM on Monday 16/11/2020 Status: Pass

drainage to South ele
Taken at 12:00 PM on Monday 16/11/2020 Status: Pass

drainage to west ele
Taken at 12:01 PM on Monday 16/11/2020 Status: Pass

drainage to north ele
Taken at 12:02 PM on Monday 16/11/2020 Status: Pass



Taken at 12:03 PM on Monday 16/11/2020 Status: Pass

GoGet Inspection Outcome Report

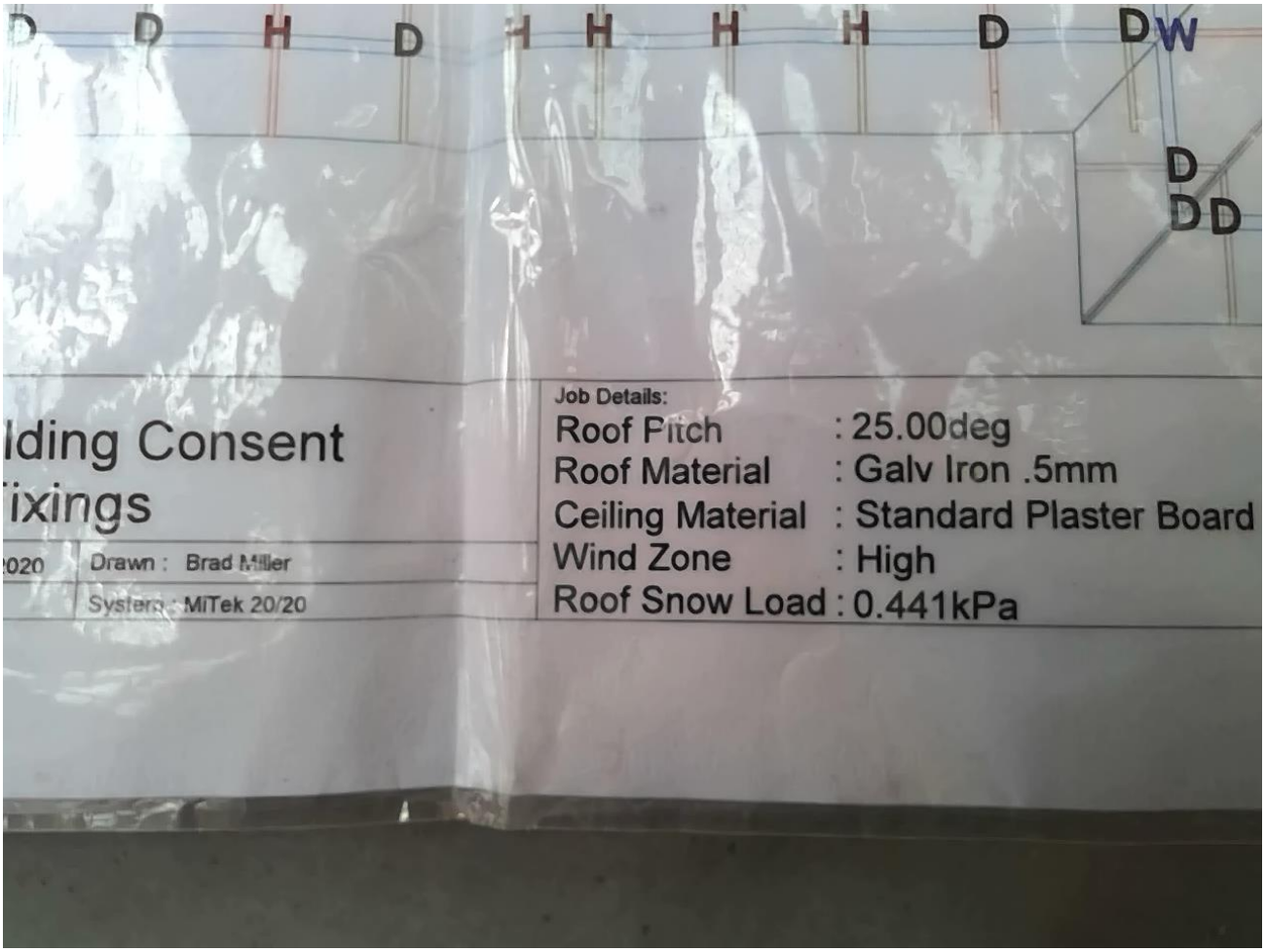
Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **217 - Pre Roof**
Inspection Outcome: **Pass**
Inspected By: **Trevor Jones**
Inspection Date: **1 December 2020 10:37 a.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Site Contact 1:Builder** **Full Name:Caleb Ayers** **Phone #:02041785114**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **253 - Pre Cladding**	NoStatus
Summary of inspection undertaken: **217 Pre Roof inspection** **Directive:Extended top plate incomplete at time of inspection (refer photo for location)**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
Engineer involvement:	N/A
Sediment control: **Sediment control has been achieved at this inspection.**	Pass
STRUCTURAL FRAMING AND CONNECTIONS	Pass
Commercial:	N/A
Sea spray zone: ***No*** **Zone C**	Pass
Building location: **Verified at 251 Foundation or Slab inspection**	Pass
Floor plan and layout:	Pass

Floor plan is as per consented documents.	
Truss & rafter design: **Truss Designer:Refer photo** **Plan Number:Refer photo**	Pass
Wind zone: **High**	Pass
Roof framing & connections: **Area of roof inspected:Total roof area** **Mitek/SED design** **Purlin connections:1x Blue Purlin screw** **Truss connections complete as per consented documentation/as-built design.**	Pass
Membrane roof & internal gutter construction:	N/A
Gable framing & connections: **As per consented drawings**	Pass
Lintel sizes, support & connections: **As per consented drawings**	Pass
Load bearing walls & connections: **As per consented drawings**	Pass
Wall framing & connections: **Top plate connections:Nail plate** **Top plate connections: Type B stud strap** **Bottom plate connections:Ramset nail and washer** **Bottom plate connections: M12 Bolt with 50mm washer @ 900mm centres.**	Pass
Wall bracing: **External bracing complete.** **Internal bracing complete.**	Pass
Sheet bracing: **Installed**	Pass
Durability: **Timber Treatment:H1.2** **DPC location:Bottom plate**	Pass
Fire wall construction:	N/A
Floor joists & connections:	N/A
Diaphragm floor:	N/A
Point loads & bearing joists:	N/A
Timber beams & connections: **As per consented drawings**	Pass
Stair pitch & headroom:	N/A
STRUCTURAL STEEL	N/A
DECKS AND ENCLOSED BALCONIES	N/A

Taken at 10:37 AM on Tuesday 1/12/2020



Taken at 10:38 AM on Tuesday 1/12/2020

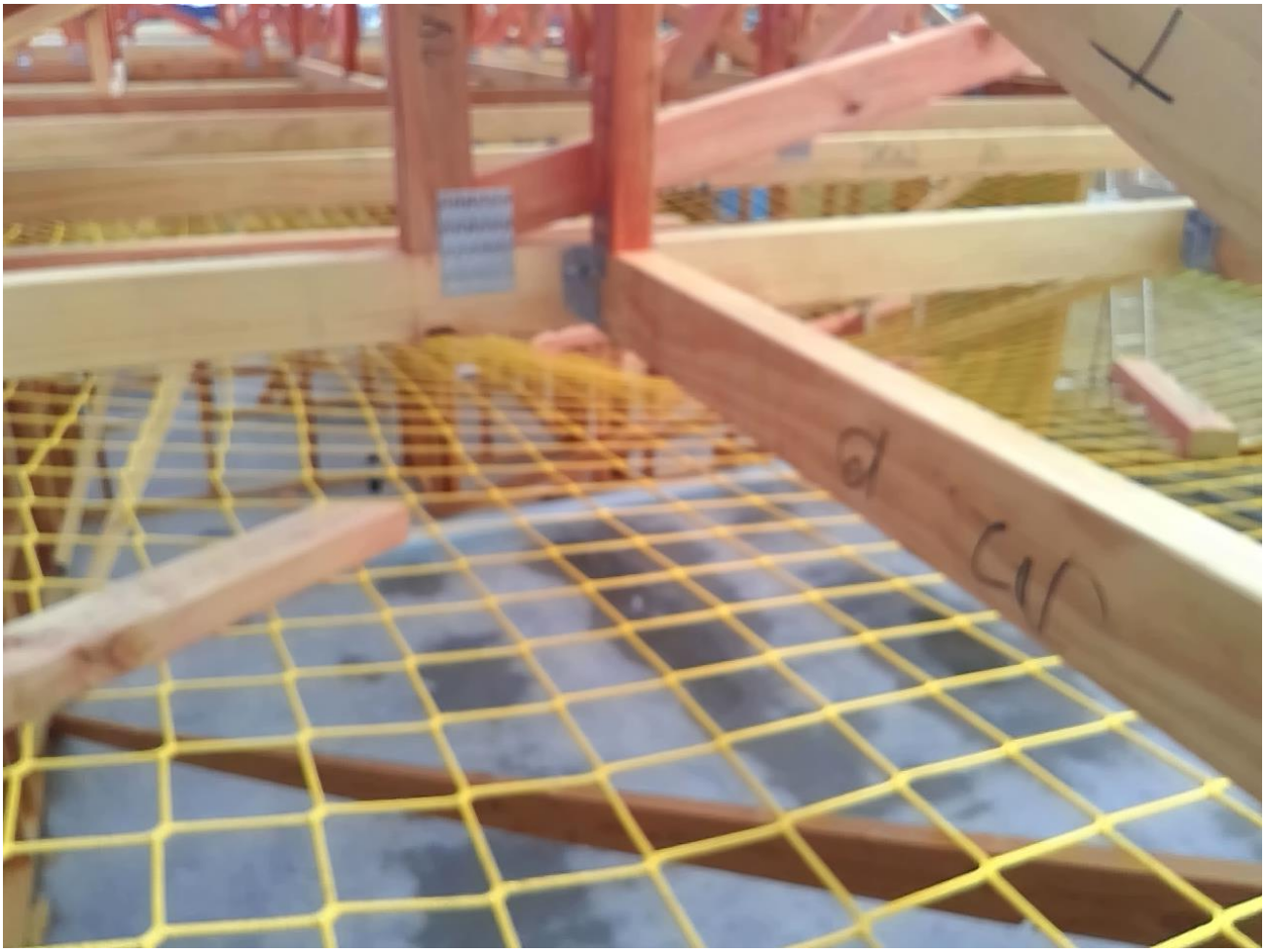
Taken at 10:45 AM on Tuesday 1/12/2020

Taken at 10:46 AM on Tuesday 1/12/2020

Taken at 10:46 AM on Tuesday 1/12/2020

Type G lintel fixings

Taken at 10:46 AM on Tuesday 1/12/2020



Taken at 10:46 AM on Tuesday 1/12/2020

Taken at 10:46 AM on Tuesday 1/12/2020

Load bearing wall
Taken at 10:47 AM on Tuesday 1/12/2020

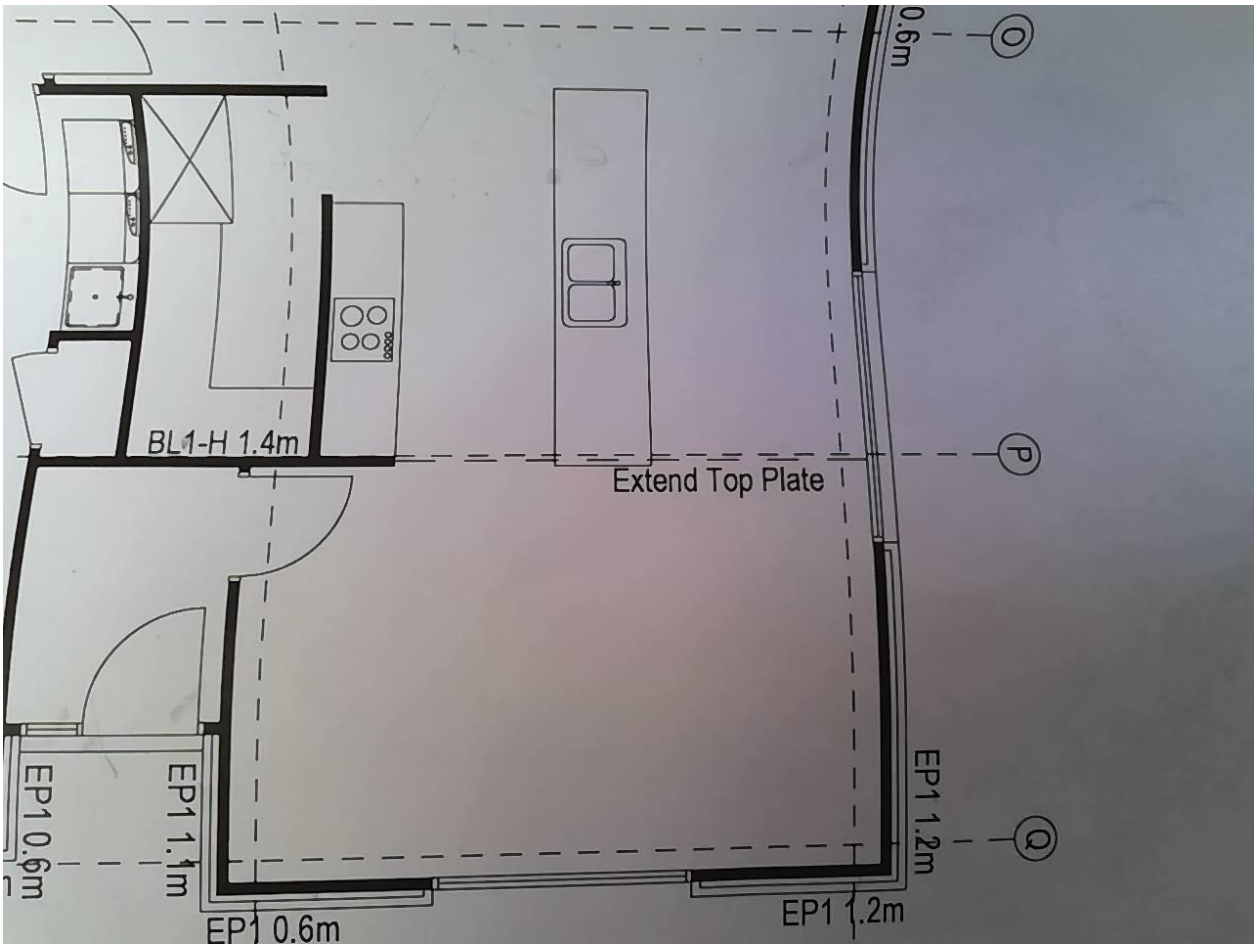
Taken at 10:48 AM on Tuesday 1/12/2020

Wire dogs to gable outriggers
Taken at 10:48 AM on Tuesday 1/12/2020

Taken at 10:48 AM on Tuesday 1/12/2020

Type F lintel fixings
Taken at 10:49 AM on Tuesday 1/12/2020

Taken at 10:49 AM on Tuesday 1/12/2020



Extended top plate incomplete at time of inspection
Taken at 10:51 AM on Tuesday 1/12/2020

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No: **202010038** Date Printed: **1 December 2020**

Applicant: **Lynley Claire Bunn**

Site Address: **8 Hoffman Street Burwood**

Legal Description: **Lot 460 DP 549008**

Work Type: **Construction of dwelling with attached garage**

Email To: **ascadltd@snap.net.nz,bugs4dragons2@gmail.com,dandbdrainage@gmail.com,[redacted]ail.com**

Inspection Type: **217 - Pre Roof**

Inspection Outcome: **Pass**

Inspected By: **Trevor Jones**

Inspector Mobile: **027 436 6310**

Inspector Email: **Trevor.Jones@ccc.govt.nz**

Inspection Date: **1 December 2020**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Site Contact 1:Builder Full Name:Caleb Ayers Phone #:02041785114**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**253 - Pre Cladding**
Summary of inspection undertaken:	**217 Pre Roof inspection Directive:Extended top plate incomplete at time of inspection (refer photo for location)**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
Sediment control:	**Sediment control has been achieved at this inspection.**

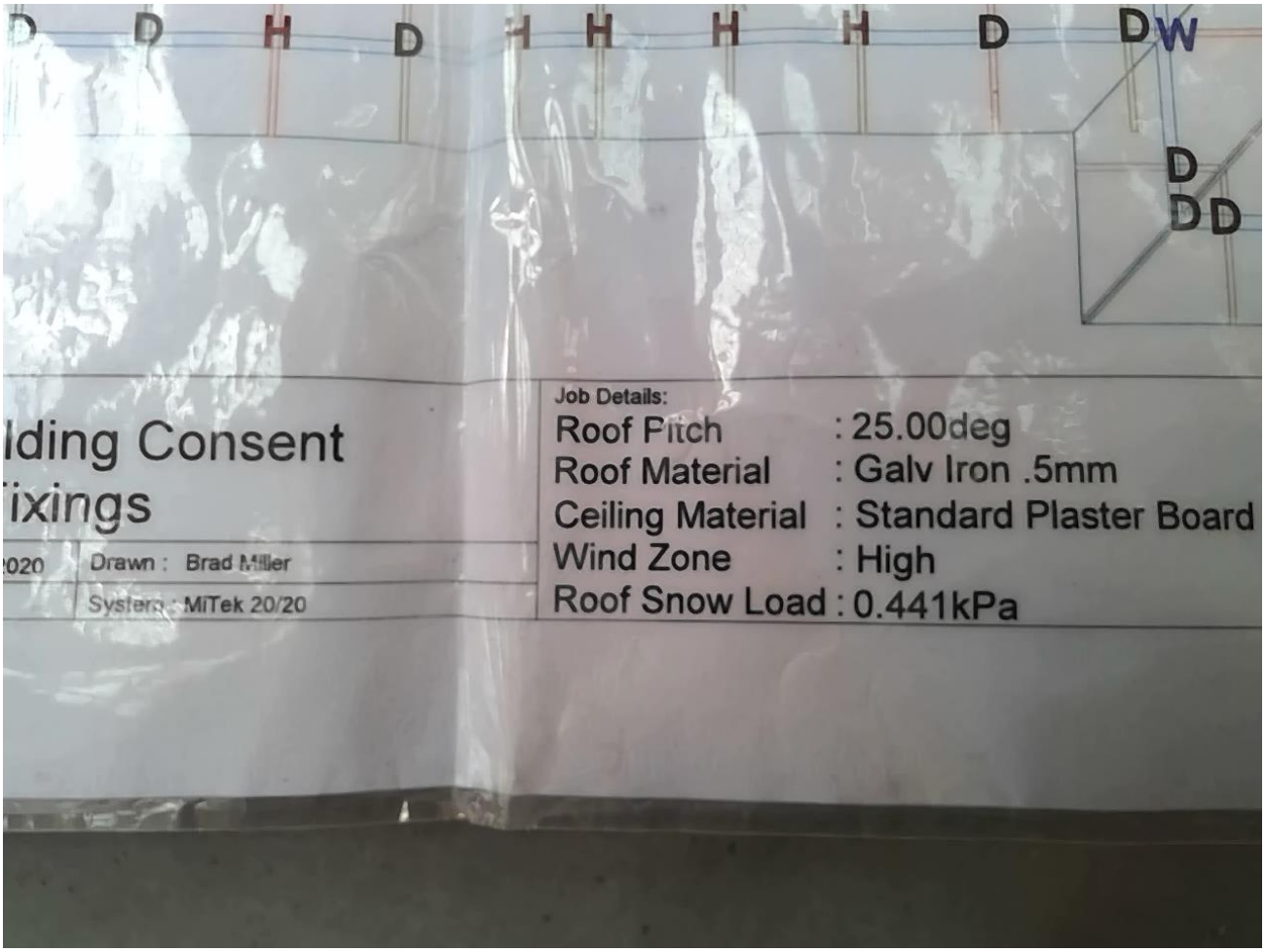
STRUCTURAL FRAMING AND CONNECTIONS

Sea spray zone:	**No Zone C**
Building location:	**Verified at 251 Foundation or Slab inspection**
Floor plan and layout:	**Floor plan is as per consented documents.**
Truss & rafter design:	**Truss Designer:Refer photo**

	Plan Number:Refer photo
Wind zone:	**High**
Roof framing & connections:	**Area of roof inspected:Total roof area** **Mitek/SED design** **Purlin connections:1x Blue Purlin screw** **Truss connections complete as per consented documentation/as-built design.**
Gable framing & connections:	**As per consented drawings**
Lintel sizes, support & connections:	**As per consented drawings**
Load bearing walls & connections:	**As per consented drawings**
Wall framing & connections:	**Top plate connections:Nail plate** **Top plate connections: Type B stud strap** **Bottom plate connections:Ramset nail and washer** **Bottom plate connections: M12 Bolt with 50mm washer @ 900mm centres.**
Wall bracing:	**External bracing complete.** **Internal bracing complete.**
Sheet bracing:	**Installed**
Durability:	**Timber Treatment:H1.2** **DPC location:Bottom plate**
Timber beams & connections:	**As per consented drawings**

Support Documentation	Status
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

Taken at 10:37 AM on Tuesday 1/12/2020



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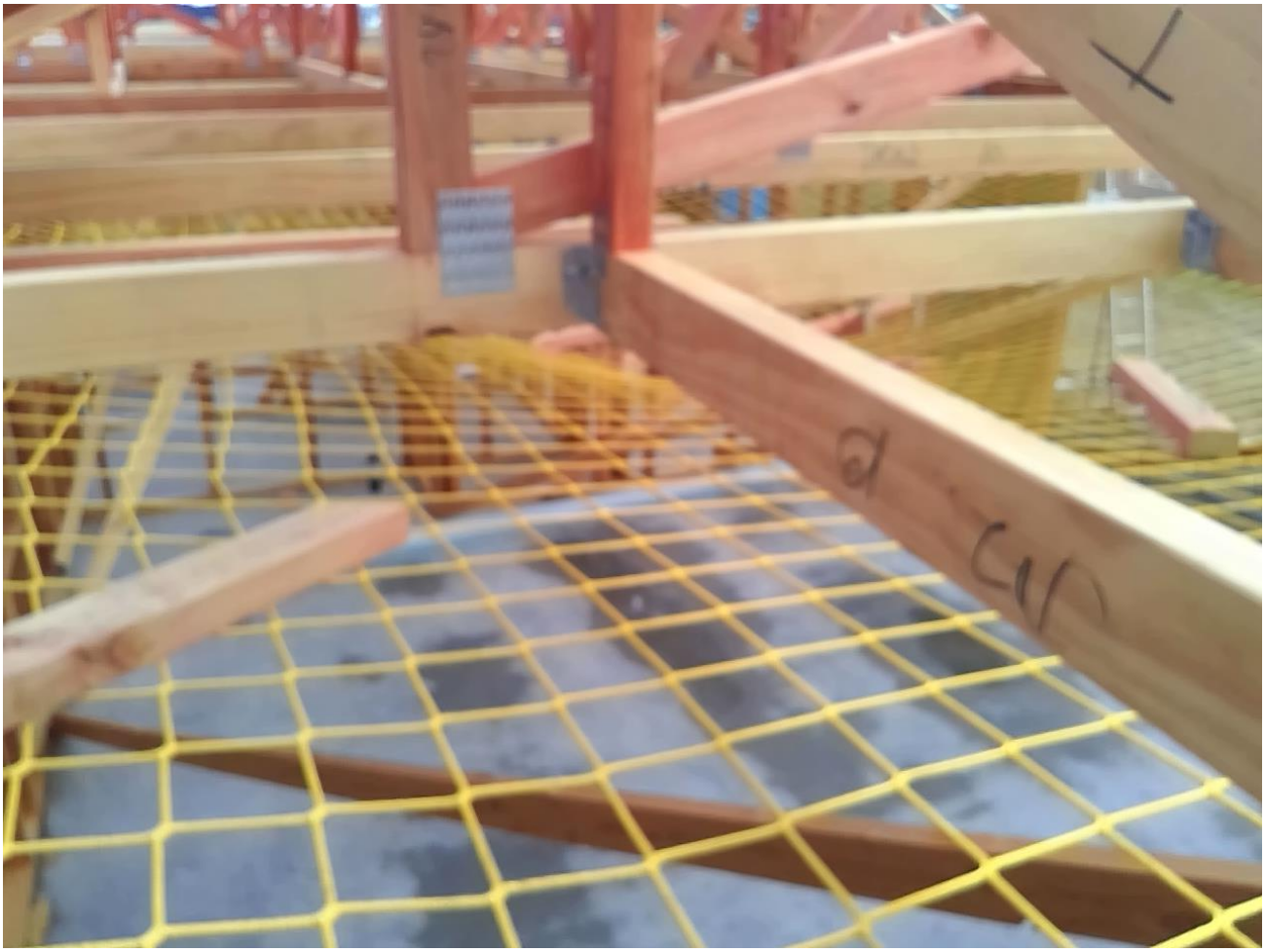

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Type F lintel fixings
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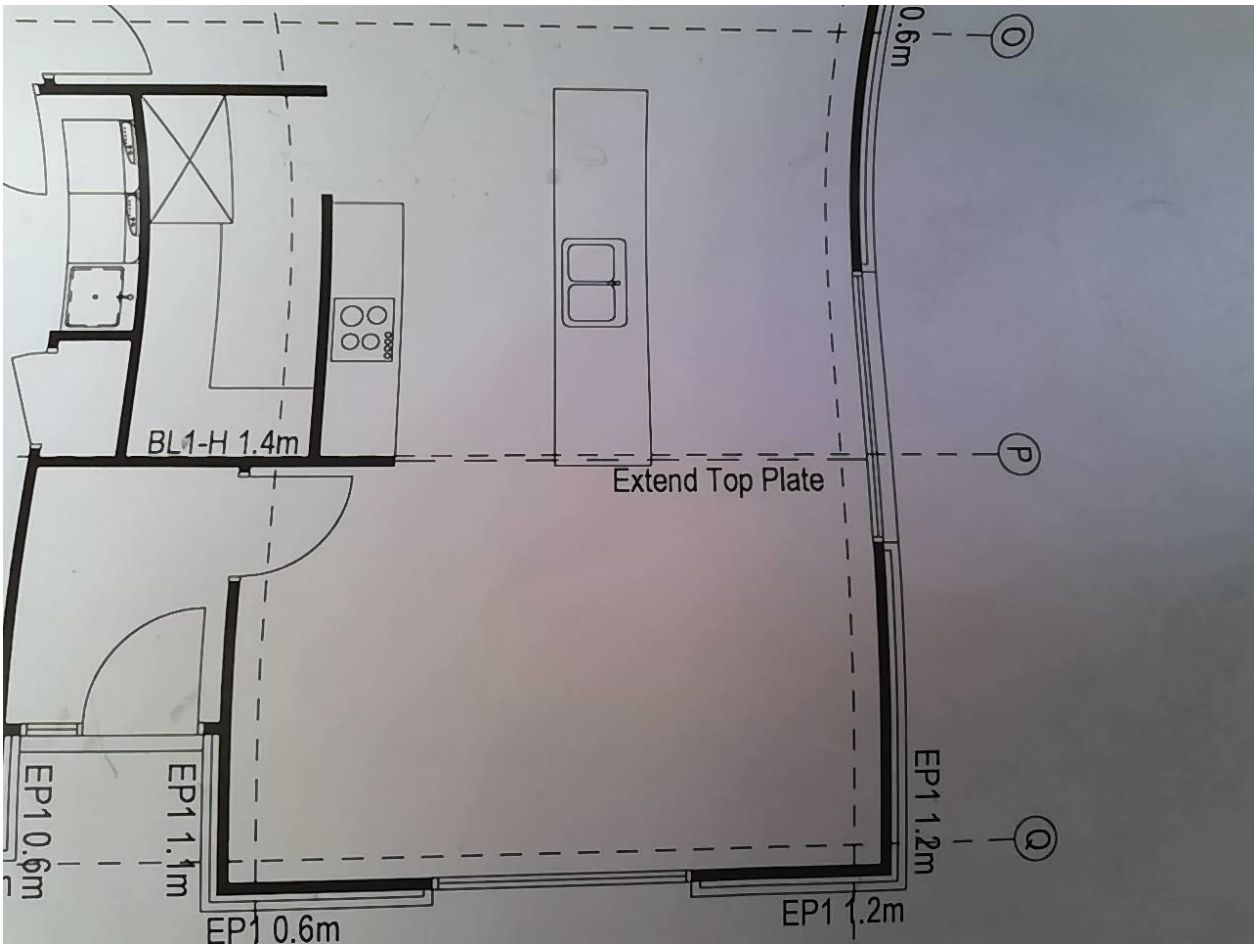


Extended top plate incomplete at time of inspection
Taken at 10:51 AM on Tuesday 1/12/2020

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **253 - Pre Cladding**
Inspection Outcome: **Pass**
Inspected By: **Glenn Mackle**
Inspection Date: **18 January 2021 2:35 p.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Note: Site was unattended during inspection.**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **211 - Half High Masonry (Half High Brick)**	NoStatus
Summary of inspection undertaken: **Building wrap, cavity systems and associated flashings completed ready for brick and vert Oblique WB claddings** **Approval to continue** **DPC flashing details to doors/window openings completed generally to E2/AS1 Fig73 details for brick veneer areas** **WANZ support bars fitted over top**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
Engineer involvement:	N/A
Sediment control: **Sediment control has been achieved at this inspection.**	Pass
BUILDING WRAP or RAB	Pass
Area inspected: **Full Inspection: Entire dwelling/building.** **Cladding Type 1: 70 series brick** **Cladding Type 2: vert for JH Oblique WB system areas**	Pass

Building Wrap or RAB type: Pass

Masons Barricade wrap installed.

Building Wrap or RAB installation: Pass

Building wrap is adequately secured to external framing with minimum overlaps achieved.
Building wrap has been returned into all openings.
Strapping has been placed between nogs where required.

Mechanical Penetrations: Pass

Mechanical services have been installed and penetrations have been adequately sealed.
DIRECTIVE: Additional mechanical penetrations to be sealed using an appropriate product/method.

Rebate: Pass

Brick rebate has been sealed.

CAVITY BATTENS Pass

Area inspected: Pass

Full Inspection: Entire dwelling/building.
Cladding Type 1: 70 series brick
Cladding Type 2: vert for JH Oblique WB system areas

Cavity battens: Pass

20mm horizontal timber castellated cavity battens installed.
Timber treatment: H3
Fixing type: Galvanized
Fixing type: Cavity battens have been secured as per manufacturers specifications.

Cavity ventilation: Pass

PVC ventilation/vermin strips installed around base of cladding.
PVC ventilation/vermin strips installed above windows and doors.
Cavities are clear of mechanical services and obstructions.

Fire separation: N/A

FLASHINGS Pass

Area inspected: Pass

Full Inspection: Entire dwelling/building.
Cladding Type 1: 70 series brick
Cladding Type 2: vert for JH Oblique WB system areas

Roof: Pass

Roof material:Corrugated Color Steel sheeting - as specified in consent
Ridge and valley flashing's installed and complete.
Barge flashing's installed and complete.

Walls: Pass

Horizontal change of cladding: Installed to specified locations as per consented detail(s).
Meterbox: Flashing's have been installed as per consented details/manufactures specifications.

Doors & Windows: Pass

Head flashings: Installed to specified areas as per consented details.
Head flashings: Appropriate stopends in place and sealed.
Sill tape: Marshall protecto installed.
Wanz bars: Installed to doors and windows and fixed accordingly.
Joinery type: Aluminium

Balconies & Decks: N/A

Other: N/A

Brick rebate has been sealed
Taken at 2:27 PM on Monday 18/01/2021 Status: Pass

east ele
Taken at 2:28 PM on Monday 18/01/2021 Status: Pass

north ele

Taken at 2:29 PM on Monday 18/01/2021 Status: Pass

cavity for vert Oblque areas

Taken at 2:30 PM on Monday 18/01/2021 Status: Pass

DPC flashing details to door/windows -brick areas
Taken at 2:31 PM on Monday 18/01/2021 Status: Pass

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No: **202010038** Date Printed: **18 January 2021**

Applicant: **Lynley Claire Bunn**

Site Address: **8 Hoffman Street Burwood**

Legal Description: **Lot 460 DP 549008**

Work Type: **Construction of dwelling with attached garage**

Email To: **ascadltd@snap.net.nz,bugs4dragons2@gmail.com,dandbdrainage@gmail.com,l[redacted]ail.com**

Inspection Type: **253 - Pre Cladding**

Inspection Outcome: **Pass**

Inspected By: **Glenn Mackle**

Inspector Mobile: **027 205 3757**

Inspector Email: **Glenn.Mackle@ccc.govt.nz**

Inspection Date: **18 January 2021**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Note: Site was unattended during inspection.**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**211 - Half High Masonry (Half High Brick)**
Summary of inspection undertaken:	**Building wrap, cavity systems and associated flashings completed ready for brick and vert Oblique WB claddings** **Approval to continue** **DPC flashing details to doors/window openings completed generally to E2/AS1 Fig73 details for brick veneer areas** **WANZ support bars fitted over top**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
Sediment control:	**Sediment control has been achieved at this inspection.**

BUILDING WRAP or RAB

Area inspected:	**Full Inspection: Entire dwelling/building.** **Cladding Type 1: 70 series brick**

	Cladding Type 2: vert for JH Oblique WB system areas
Building Wrap or RAB type:	**Masons Barricade wrap installed.**
Building Wrap or RAB installation:	**Building wrap is adequately secured to external framing with minimum overlaps achieved.** **Building wrap has been returned into all openings.** **Strapping has been placed between nogs where required.**
Mechanical Penetrations:	**Mechanical services have been installed and penetrations have been adequately sealed.** **DIRECTIVE: Additional mechanical penetrations to be sealed using an appropriate product/method.**
Rebate:	**Brick rebate has been sealed.**

CAVITY BATTENS

Area inspected:	**Full Inspection: Entire dwelling/building.** **Cladding Type 1: 70 series brick** **Cladding Type 2: vert for JH Oblique WB system areas**
Cavity battens:	**20mm horizontal timber castellated cavity battens installed.** **Timber treatment: H3** **Fixing type: Galvanized** **Fixing type: Cavity battens have been secured as per manufacturers specifications.**
Cavity ventilation:	**PVC ventilation/vermin strips installed around base of cladding.** **PVC ventilation/vermin strips installed above windows and doors.** **Cavities are clear of mechanical services and obstructions.**

FLASHINGS

Area inspected:	**Full Inspection: Entire dwelling/building.** **Cladding Type 1: 70 series brick** **Cladding Type 2: vert for JH Oblique WB system areas**
Roof:	**Roof material:Corrugated Color Steel sheeting - as specified in consent** **Ridge and valley flashing's installed and complete.** **Barge flashing's installed and complete.**
Walls:	**Horizontal change of cladding: Installed to specified locations as per consented detail(s).** **Meterbox: Flashing's have been installed as per consented details/manufactures specifications.**
Doors & Windows:	**Head flashings: Installed to specified areas as per consented details.** **Head flashings: Appropriate stopends in place and sealed.** **Sill tape: Marshall protecto installed.** **Wanz bars: Installed to doors and windows and fixed accordingly.** **Joinery type: Aluminium**

Support Documentation	**Status**
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block	

laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

Brick rebate has been sealed
Taken at 2:27 PM on Monday 18/01/2021 Status: Pass

east ele
Taken at 2:28 PM on Monday 18/01/2021 Status: Pass

north ele

Taken at 2:29 PM on Monday 18/01/2021 Status: Pass

cavity for vert Oblque areas

Taken at 2:30 PM on Monday 18/01/2021 Status: Pass

DPC flashing details to door/windows -brick areas
Taken at 2:31 PM on Monday 18/01/2021 Status: Pass

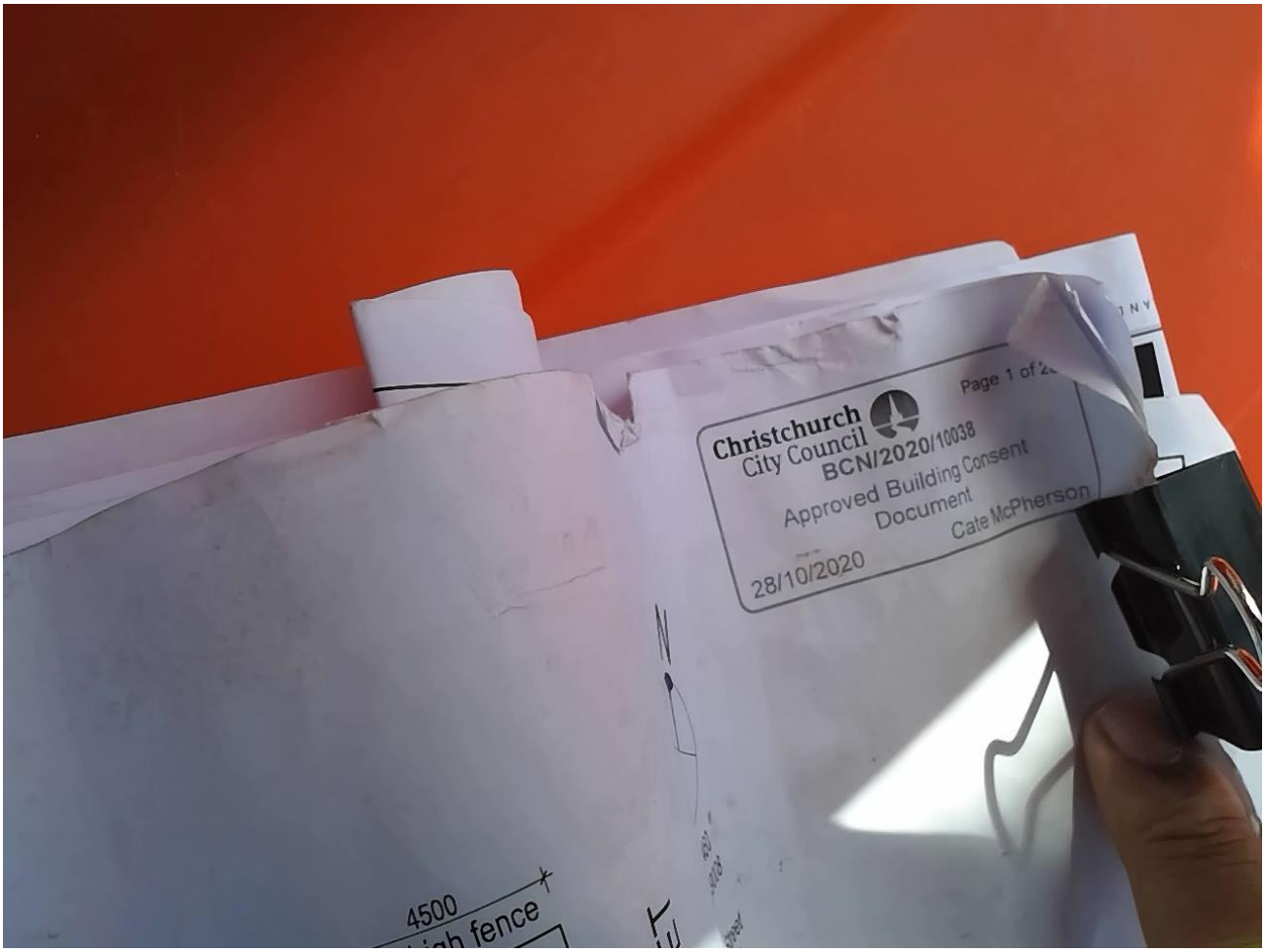
GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **211 - Half High Masonry (Half High Brick)**
Inspection Outcome: **Pass**
Inspected By: **Brian Abrahams**
Inspection Date: **25 January 2021 12:34 p.m.**
Duration: **30 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Site Contact 1:** **Full Name: Alby Hyet - bricklayer** **Phone #: 0272299598**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **Contractor to confirm (Refer to CCC Schedule of Estimated Specified Inspections).**	NoStatus
Summary of inspection undertaken: **Observation:** **1. 70series brickwork installed as per consent.** **2. Full length support bars under doors & windows.** **3. Supercourse around windows & doors.** **4. Supercourse @ sill 200mm pass opening both sides.** **5. Weepholes every 3rd brick** **6. 40-50mm clean cavity.** **7. Brick overhang 0-15mm.** **8. Ties 2nd course + every 4th course @ 600mmc/c.** **Directive:** **Approved to continue**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
Engineer involvement:	N/A
Sediment control: **Sediment control has been achieved at this inspection.**	Pass

BRICK VENEER	Pass
Type: ***Clay***	Pass
Single Storey or Two Storey: ***Single Storey***	Pass
Face of building: ***Whole Building***	Pass
Sea spray zone: ***No***	Pass
Cavities:	Pass
Framing:	Pass
Brickwork:	Pass
Flashing:	Pass
LINTELS & SHELF ANGLES	N/A



Taken at 12:21 PM on Monday 25/01/2021


Taken at 12:22 PM on Monday 25/01/2021

Taken at 12:23 PM on Monday 25/01/2021

Taken at 12:23 PM on Monday 25/01/2021

backflashing @ cladding change
Taken at 12:23 PM on Monday 25/01/2021

Weep holes every 3rd brick
Taken at 12:24 PM on Monday 25/01/2021

melthoud extends 200mm pass opening
Taken at 12:25 PM on Monday 25/01/2021

Taken at 12:26 PM on Monday 25/01/2021

west side
Taken at 12:27 PM on Monday 25/01/2021

South side
Taken at 12:27 PM on Monday 25/01/2021

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No:	**202010038**	Date Printed:	**25 January 2021**
Applicant:	**Lynley Claire Bunn**		
Site Address:	**8 Hoffman Street Burwood**		
Legal Description:	**Lot 460 DP 549008**		
Work Type:	**Construction of dwelling with attached garage**		
Email To:	**albyhyett@hotmail.com,ascadltd@snap.net.nz,bugs4dragons2@gmail.com,dandbdrainage @gmail.com,[redacted]**		

Inspection Type:	**211 - Half High Masonry (Half High Brick)**
Inspection Outcome:	**Pass**
Inspected By:	**Brian Abrahams**
Inspector Mobile:	**027 497 1469**
Inspector Email:	**Brian.Abrahams@ccc.govt.nz**
Inspection Date:	**25 January 2021**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Site Contact 1:** **Full Name: Alby Hyet - bricklayer** **Phone #: 0272299598**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**Contractor to confirm (Refer to CCC Schedule of Estimated Specified Inspections).**
Summary of inspection undertaken:	**Observation:** **1. 70series brickwork installed as per consent.** **2. Full length support bars under doors & windows.** **3. Supercourse around windows & doors.** **4. Supercourse @ sill 200mm pass opening both sides.** **5. Weepholes every 3rd brick** **6. 40-50mm clean cavity.** **7. Brick overhang 0-15mm.** **8. Ties 2nd course + every 4th course @ 600mmc/c.** **Directive:** **Approved to continue**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**

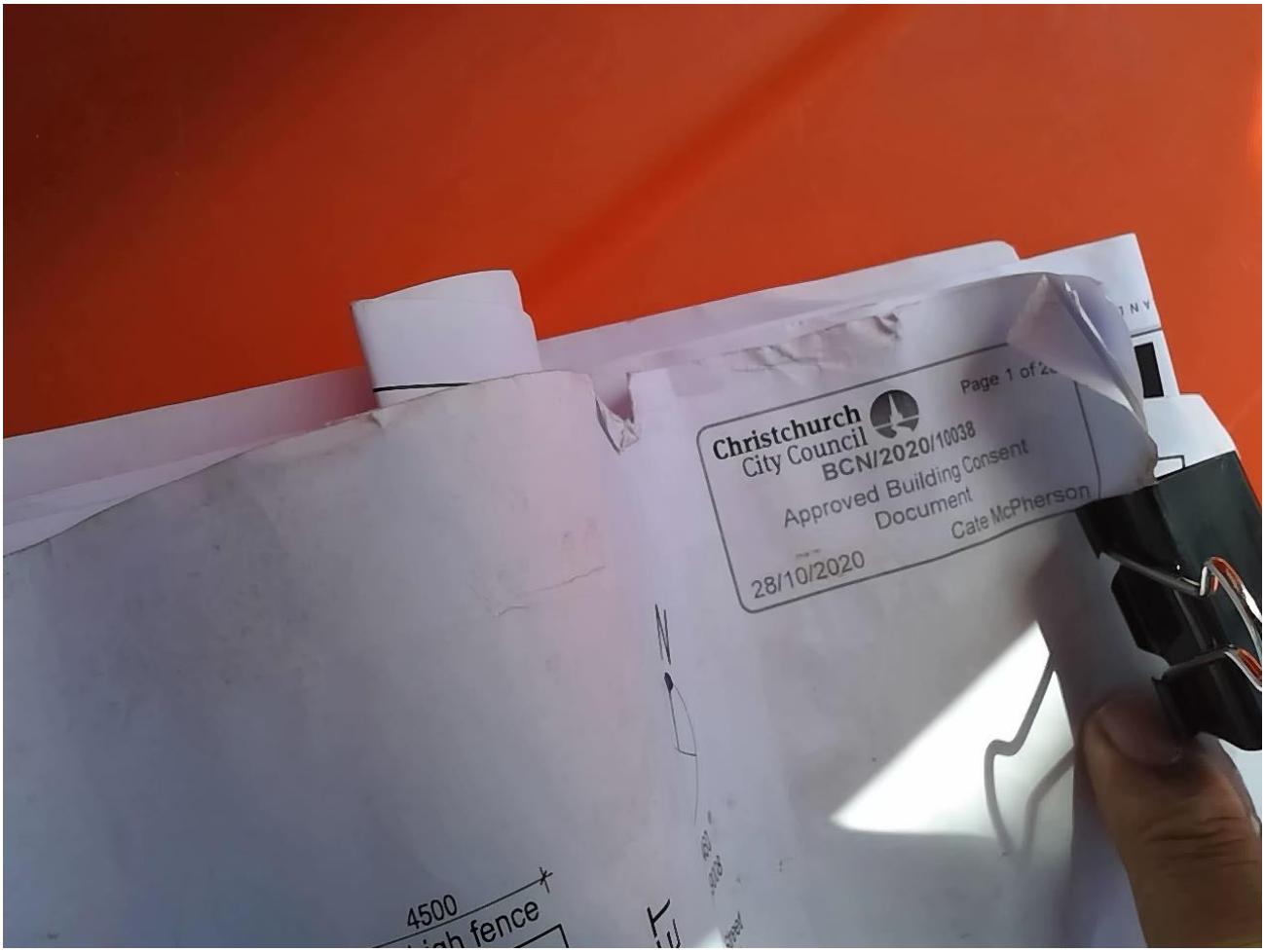
Sediment control:	**Sediment control has been achieved at this inspection.**

BRICK VENEER

Type:	**Clay**
Single Storey or Two Storey:	**Single Storey**
Face of building:	**Whole Building**
Sea spray zone:	**No**
Cavities:	
Framing:	
Brickwork:	
Flashing:	

Support Documentation

Support Documentation	Status
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required



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Taken at 12:26 PM on Monday 25/01/2021

west side
Taken at 12:27 PM on Monday 25/01/2021

South side
Taken at 12:27 PM on Monday 25/01/2021

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **205 - Pre Line (Pre Line including Plumbing)**
Inspection Outcome: **Pass**
Inspected By: **Glenn Mackle**
Inspection Date: **2 February 2021 12:32 p.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Site Contact 1:Builder** **Full Name:Caleb Ayers** **Phone #:02041785114**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **216 - Interior Tanking (Pre Tile Tanking)**	NoStatus
Summary of inspection undertaken: **All bracing elements, plumbing work and insulation completed as specified in consent plans/documentation.** **Pipework on pressure** **Approval to line**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
Engineer involvement:	N/A
Sediment control: **Sediment control has been achieved at this inspection.**	Pass
PRE LINE BUILDING	Pass
Weather tightness achieved: **Exterior cladding is weather tight for the purpose of pre line.**	Pass
Floor plan layout: **Floor plan is as per consented documents.**	Pass
Moisture content:	Pass

Walls:12-15%
Ceiling battens: 13%

Structural framing: Pass
Original structural framing integrity still achieved.

Internal bracing: Pass
External and internal specific hold down fixings for wall bracing elements completed as in consent bracing schedule and product/ manufacturers specifications

Insulation: Pass
Walls:2.6
Ceilings:3.6
Insulation type: Earthwool/Glasswool

Ducting: Pass
Installed to wet areas
Installed to kitchen area

Air seals: Pass
Complete to doors and windows over PEF rod.

Window fixings: Pass
Reveal fixings installed as per E2/AS1

Angle corner to showers: Pass
Installed to ensuite shower

Safety glass location: Pass
Safety glass installed to wet areas.
Safety glass installed to large glass panels.

Stairs, treads, risers: N/A

PLUMBING Pass

Plumbing waste system design: Pass
G13/AS1

Drainage system venting: Pass
Location of main vent:80mm Main Vent installed near top of SS lateral on west ele

Soil stack restricted connection zones: N/A

Soil pipe size: Pass
100mm

Suspended subfloor waste pipework: N/A

Hot & cold supply pipework: Pass
Pipe Type: Dux Polybutylene water supply piping utilized throughout
Water isolation valve location: garage south wall
Pipe work supported
Pipe work lagged beyond thermal barrier
Pipe work pressurized at time of inspection

Support & restraint of HWC in ceiling: N/A

HWC relief drain: Pass
gas hw system

FIRE & INTERTENANCY WALLS N/A

COMMERCIAL ACCESSIBLE FACILITIES N/A

main areas
Taken at 12:18 PM on Tuesday 2/02/2021 Status: Pass

angles to tiled ensuite shower
Taken at 12:25 PM on Tuesday 2/02/2021 Status: Pass

Dux Polybutylene water supply piping utilized throughout
Taken at 12:27 PM on Tuesday 2/02/2021 Status: Pass

Water isolation valve in garage south wall
Taken at 12:28 PM on Tuesday 2/02/2021 Status: Pass

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No:	**202010038**	Date Printed:	**2 February 2021**
Applicant:	**Lynley Claire Bunn**		
Site Address:	**8 Hoffman Street Burwood**		
Legal Description:	**Lot 460 DP 549008**		
Work Type:	**Construction of dwelling with attached garage**		
Email To:	**albyhyett@hotmail.com,ascadltd@snap.net.nz,bugs4dragons2@gmail.com,[redacted]om**		

Inspection Type:	**205 - Pre Line (Pre Line including Plumbing)**
Inspection Outcome:	**Pass**
Inspected By:	**Glenn Mackle**
Inspector Mobile:	**027 205 3757**
Inspector Email:	**Glenn.Mackle@ccc.govt.nz**
Inspection Date:	**2 February 2021**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Site Contact 1:Builder Full Name:Caleb Ayers Phone #:02041785114**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**216 - Interior Tanking (Pre Tile Tanking)**
Summary of inspection undertaken:	**All bracing elements, plumbing work and insulation completed as specified in consent plans/documentation. Pipework on pressure Approval to line**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
Sediment control:	**Sediment control has been achieved at this inspection.**

PRE LINE BUILDING

Weather tightness achieved:	**Exterior cladding is weather tight for the purpose of pre line.**
Floor plan layout:	**Floor plan is as per consented documents.**
Moisture content:	**Walls:12-15%**

	Ceiling battens: 13%
Structural framing:	**Original structural framing integrity still achieved.**
Internal bracing:	**External and internal specific hold down fixings for wall bracing elements completed as in consent bracing schedule and product/ manufacturers specifications**
Insulation:	**Walls:2.6** **Ceilings:3.6** **Insulation type: Earthwool/Glasswool**
Ducting:	**Installed to wet areas** **Installed to kitchen area**
Air seals:	**Complete to doors and windows over PEF rod.**
Window fixings:	**Reveal fixings installed as per E2/AS1**
Angle corner to showers:	**Installed to ensuite shower**
Safety glass location:	**Safety glass installed to wet areas.** **Safety glass installed to large glass panels.**

PLUMBING

Plumbing waste system design:	**G13/AS1**
Drainage system venting:	**Location of main vent:80mm Main Vent installed near top of SS lateral on west ele**
Soil pipe size:	**100mm**
Hot & cold supply pipework:	**Pipe Type: Dux Polybutylene water supply piping utilized throughout** **Water isolation valve location: garage south wall** **Pipe work supported** **Pipe work lagged beyond thermal barrier** **Pipe work pressurized at time of inspection**
HWC relief drain:	**gas hw system**

Support Documentation	Status
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-AB07 - Foulwater and stormwater drains layouts	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

main areas
Taken at 12:18 PM on Tuesday 2/02/2021 Status: Pass

angles to tiled ensuite shower
Taken at 12:25 PM on Tuesday 2/02/2021 Status: Pass

Dux Polybutylene water supply piping utilized throughout
Taken at 12:27 PM on Tuesday 2/02/2021 Status: Pass

Water isolation valve in garage south wall
Taken at 12:28 PM on Tuesday 2/02/2021 Status: Pass

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **216 - Interior Tanking (Pre Tile Tanking)**
Inspection Outcome: **Pass**
Inspected By: **Glenn Mackle**
Inspection Date: **5 March 2021 1:48 p.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed: ***YES***	Pass
Primary site contact: **Note: Site was unattended during inspection.**	Pass
Site safety concerns: ***NO - Inspection was completed under the site inspection guidelines.***	Pass
SUMMARY	NoStatus
Inspection outcome: **Approved to continue to next inspection.**	NoStatus
Next inspection required: **210 - Residential - Final**	NoStatus
Summary of inspection undertaken: **Hydroban Laticrete used on showers with product reinforcing to all internal corners.** **Make sure Waterproofing Statement submitted with general documentation for Code Compliance** **Approval to tile**	NoStatus
GENERAL	Pass
Supervision: **Competent**	Pass
Work ready: **FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**	Pass
Previous inspections completed: **Required inspections are passed and completed.**	Pass
Multi-Unit or Multi-Level:	N/A
Consented documentation: **All stamped consented documentation has been provided for this inspection.**	Pass
TANKING	Pass
Tanking location: **Interior tiled shower - ensuite**	Pass
Tanking system: **Hydroban Laticrete**	Pass
Tanking application: **Tanking product has been applied as per manufacturers specifications.** **Tanking applied to: Shower wall and floor areas.**	Pass
Grade (fall) to floorwaste: **Enclosed shower: Wall enclosure (glass, screen or curtain) to be completed and confirmed at final inspection.**	Pass

Shower base: Level threshold
OBSERVATION: appropriate fall to floor waste has been achieved.

ensuite shower
Taken at 1:26 PM on Friday 5/03/2021 Status: Pass

bath cradle waterproofed
Taken at 1:29 PM on Friday 5/03/2021 Status: Pass

Christchurch City Council

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No:	**202010038**	Date Printed:	**5 March 2021**
Applicant:	**Lynley Claire Bunn**		
Site Address:	**8 Hoffman Street Burwood**		
Legal Description:	**Lot 460 DP 549008**		
Work Type:	**Construction of dwelling with attached garage**		
Email To:	**albyhyett@hotmail.com,ascadltd@snap.net.nz,bugs4dragons2@gmail.com,l[redacted]om**		

Inspection Type:	**216 - Interior Tanking (Pre Tile Tanking)**
Inspection Outcome:	**Pass**
Inspected By:	**Glenn Mackle**
Inspector Mobile:	**027 205 3757**
Inspector Email:	**Glenn.Mackle@ccc.govt.nz**
Inspection Date:	**5 March 2021**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**YES**
Primary site contact:	**Note: Site was unattended during inspection.**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Approved to continue to next inspection.**
Next inspection required:	**210 - Residential - Final**
Summary of inspection undertaken:	**Hydroban Laticrete used on showers with product reinforcing to all internal corners. Make sure Waterproofing Statement submitted with general documentation for Code Compliance Approval to tile**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.**
Previous inspections completed:	**Required inspections are passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**

TANKING

Tanking location:	**Interior tiled shower - ensuite**
Tanking system:	**Hydroban Laticrete**
Tanking application:	**Tanking product has been applied as per manufacturers specifications. Tanking applied to: Shower wall and floor areas.**
Grade (fall) to floorwaste:	**Enclosed shower: Wall enclosure (glass, screen or curtain) to be completed and confirmed at final inspection.**

Shower base: Level threshold
OBSERVATION: appropriate fall to floor waste has been achieved.

Support Documentation	Status
CDOC-AB07 - Foulwater and stormwater drains layouts	Accepted
TRIM://21/140212 Accepted as laid correct address, bcn, CD M Boulton #29791 supervised by R Tapp #24836 , verified - Document(s) can be relied on as author is qualified and holds a current registration - Andrea Morton - 9/2/2021	
CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

ensuite shower
Taken at 1:26 PM on Friday 5/03/2021 Status: Pass

bath cradle waterproofed
Taken at 1:29 PM on Friday 5/03/2021 Status: Pass

GoGet Inspection Outcome Report

Consent No: **202010038**
Applicant: **Lynley Claire Bunn**
Site Address: **8 Hoffman Street Burwood**
Legal Description: **Lot 460 DP 549008**
Work Type: **Construction of dwelling with attached garage**
Workgroup: **Area 2 - Residential**

Inspection Type: **210 - Residential - Final**
Inspection Outcome: **Pass**
Inspected By: **Jacs Taylor**
Inspection Date: **6 April 2021 2:09 p.m.**
Duration: **45 minutes**

Inspection Element	Status
COVID-19 (Level 1)	Pass
Site sign in completed:	Pass
N/A	
Primary site contact:	Pass
Site Contact 1: POC **Full Name: Caleb Ayers** **Phone #: 02041785114**	
Site safety concerns:	Pass
NO - Inspection was completed under the site inspection guidelines.	
SUMMARY	NoStatus
Inspection outcome:	NoStatus
Christchurch City Council can now confirm that all required inspections for this building consent are now complete. ****Please submit your "B-011 - Application for code compliance certificate" along with required supporting documentation listed in your CCC Building Consent Documentation and Advice Notes or at the bottom of this inspection report**** **SUBMITTING AN APPLICATION:** **Email to: codecompliance@ccc.govt.nz with the building consent number in the email subject line.** **Online Services: (If registered) at http://onlineservices.ccc.govt.nz**	
Summary of inspection undertaken:	NoStatus
210 final on a single level dwelling with attached garage. **Appears to be in accordance with the building consent**	
GENERAL	Pass
Supervision:	Pass
Competent	
Work ready:	Pass
FULL INSPECTION: All areas under this inspection type are ready for inspection and covered under this site report.	
Previous inspections completed:	Pass
All required inspection types for this building consent have been passed and completed.	
Multi-Unit or Multi-Level:	N/A
Consented documentation:	Pass
All stamped consented documentation has been provided for this inspection.	
Engineer involvement:	N/A
Sediment control:	Pass
Sediment control has been achieved at this inspection.	

EXTERIOR — Pass

Roof, Cladding & Weather Tightness: — Pass
Roof cladding type: Long run iron
Floor clearance:110mm
Cladding clearance:35mm to brick
Flashings: In place
External cladding integrity: Good
Cavity closures installed.
Mechanical penetrations have been sealed.
Minimum 20mm spouting clearance to cladding achieved.

Plumbing & Drainage: — Pass
Location of sump(s): bubble up front of property
Spouting & downpipes fitted and connected to stormwater system.
Gully traps have been haunched and protected.
Positive drainage away from dwelling is to be maintained.
Vent cowls have been installed.

Barriers, Handrails & Stairs: — N/A

Driveway & Sealed Areas: — Pass
Driveway has been completed as per consented plans
Sealed areas including patios have been completed as per consented plans.
Step down from interior: 160mm

Deck: — N/A

Balcony: — N/A

Retaining Walls: — N/A

Other: — N/A

INTERIOR — Pass

Ventilation & Visual Awareness: — Pass
Passive ventilation achieved to all habitable rooms.
Mechanical ventilation installed to wet areas.
Mechanical ventilation installed to kitchen,

Insulation: — Pass
Ceiling batts in place at time of inspection.

Smoke & Fire Alarms: — Pass
Battery operated smoke alarms installed and tested at time of inspection.

Smoke/Fire Separation & STC: — N/A

Barriers, Handrails & Stairs: — N/A

Hot Water System: — Pass
Gas hot water system.

Kitchen: — Pass
Wall finishes complete & sealed.
Floor finishes complete & sealed.
Fixtures installed and connected.
Stove/hob clearance: 35mm
Other (specify): Rangehood: 750mm

Service Rooms: — Pass
Wall finishes complete & sealed.
Floor finishes complete and sealed.
Fixtures installed and operational.
All fixtures have been sealed.
Safety glass installed.

Plumbing & Drainage: — Pass
AAV installed to kitchen waste.
AAV installed to vanity.
Water isolation valve location: garage wall
Floor waste gully installed to: Shower

Attached Garage: — Pass
Door rebate installed.
Adequate weather seal achieved.

Solid Fuel Heaters & Boilers:	N/A
DETACHED STRUCTURES:	N/A
HISTORIC CONSENTS	N/A

Isolation valve
Taken at 1:33 PM on Tuesday 6/04/2021

Laundry
Taken at 1:33 PM on Tuesday 6/04/2021

Smoke alarm
Taken at 1:34 PM on Tuesday 6/04/2021

Main bathroom
Taken at 1:34 PM on Tuesday 6/04/2021

Safety glass
Taken at 1:35 PM on Tuesday 6/04/2021

Ensuite
Taken at 1:35 PM on Tuesday 6/04/2021

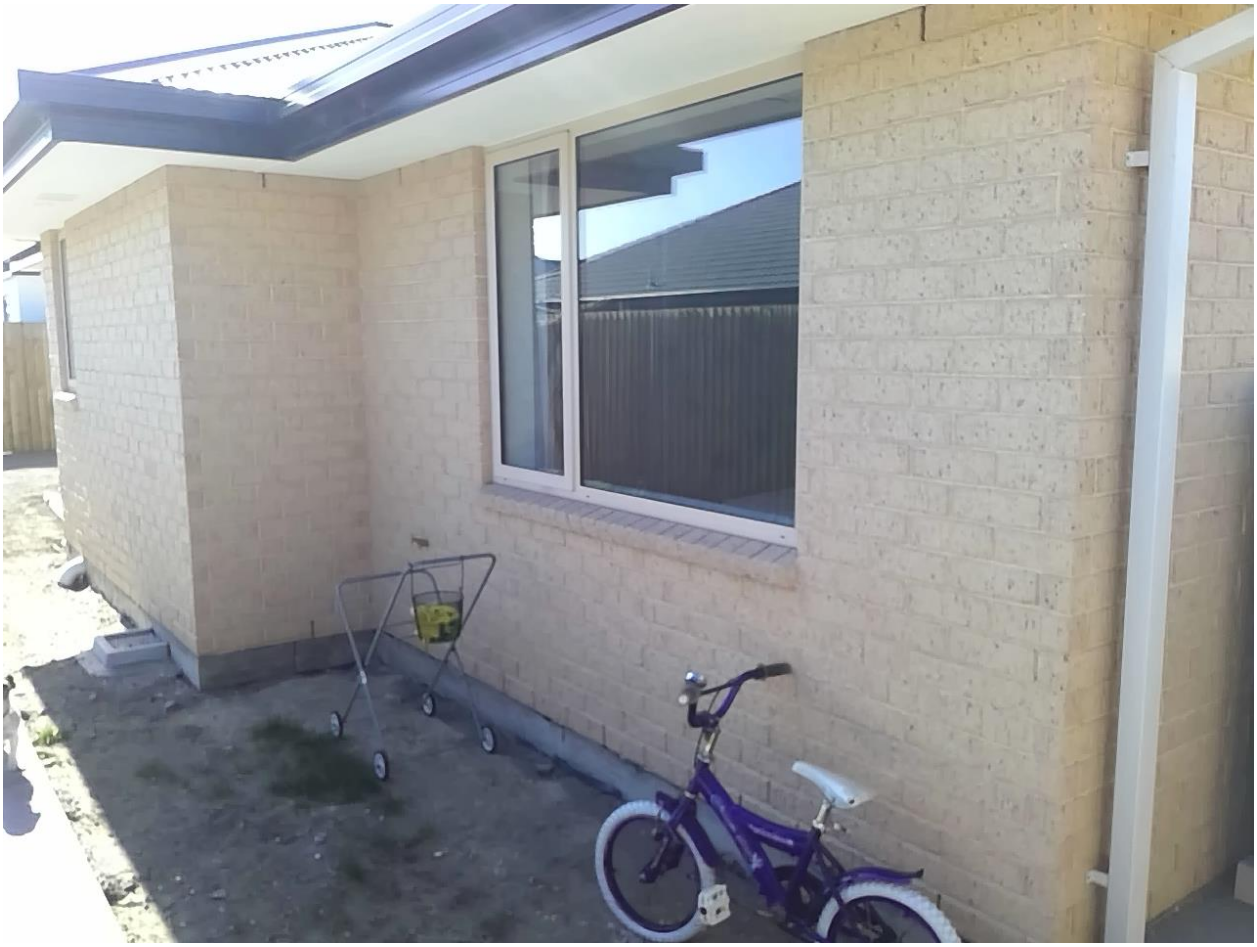
scullary
Taken at 1:36 PM on Tuesday 6/04/2021

Kitchen
Taken at 1:36 PM on Tuesday 6/04/2021

Elevation and gas station
Taken at 1:44 PM on Tuesday 6/04/2021

Elevation
Taken at 1:44 PM on Tuesday 6/04/2021

Gully trap
Taken at 1:44 PM on Tuesday 6/04/2021



elevation
Taken at 1:45 PM on Tuesday 6/04/2021

Elevation
Taken at 1:45 PM on Tuesday 6/04/2021

Elevation
Taken at 1:46 PM on Tuesday 6/04/2021

Elevation
Taken at 1:46 PM on Tuesday 6/04/2021

Bubble up sump
Taken at 1:52 PM on Tuesday 6/04/2021

53 Hereford Street
Christchurch
Phone 03 941 8222

SITE NOTICE

Consent No:	**202010038**	Date Printed:	**6 April 2021**
Applicant:	**Lynley Claire Bunn**		
Site Address:	**8 Hoffman Street Burwood**		
Legal Description:	**Lot 460 DP 549008**		
Work Type:	**Construction of dwelling with attached garage**		
Email To:	**albyhyett@hotmail.com,ascadltd@snap.net.nz,bugs4dragons2@gmail.com,** [redacted] **om**		

Inspection Type:	**210 - Residential - Final**
Inspection Outcome:	**Pass**
Inspected By:	**Jacs Taylor**
Inspector Mobile:	**027 509 4278**
Inspector Email:	**Jacs.Taylor@ccc.govt.nz**
Inspection Date:	**6 April 2021**

Passed Items

COVID-19 (Level 1)

Site sign in completed:	**N/A**
Primary site contact:	**Site Contact 1: POC** **Full Name: Caleb Ayers** **Phone #: 02041785114**
Site safety concerns:	**NO - Inspection was completed under the site inspection guidelines.**

SUMMARY

Inspection outcome:	**Christchurch City Council can now confirm that all required inspections for this building consent are now complete.** ****Please submit your "B-011 - Application for code compliance certificate" along with required supporting documentation listed in your CCC Building Consent Documentation and Advice Notes or at the bottom of this inspection report**** **SUBMITTING AN APPLICATION:** **Email to: codecompliance@ccc.govt.nz with the building consent number in the email subject line.** **Online Services: (If registered) at http://onlineservices.ccc.govt.nz**
Summary of inspection undertaken:	**210 final on a single level dwelling with attached garage.** **Appears to be in accordance with the building consent**

GENERAL

Work ready:	**FULL INSPECTION: All areas under this inspection**

	type are ready for inspection and covered under this site report.
Previous inspections completed:	**All required inspection types for this building consent have been passed and completed.**
Consented documentation:	**All stamped consented documentation has been provided for this inspection.**
Sediment control:	**Sediment control has been achieved at this inspection.**

EXTERIOR

Roof, Cladding & Weather Tightness:	**Roof cladding type: Long run iron** **Floor clearance:110mm** **Cladding clearance:35mm to brick** **Flashings: In place** **External cladding integrity: Good** **Cavity closures installed.** **Mechanical penetrations have been sealed.** **Minimum 20mm spouting clearance to cladding achieved.**
Plumbing & Drainage:	**Location of sump(s): bubble up front of property** **Spouting & downpipes fitted and connected to stormwater system.** **Gully traps have been haunched and protected.** **Positive drainage away from dwelling is to be maintained.** **Vent cowls have been installed.**
Driveway & Sealed Areas:	**Driveway has been completed as per consented plans** **Sealed areas including patios have been completed as per consented plans.** **Step down from interior: 160mm**

INTERIOR

Ventilation & Visual Awareness:	**Passive ventilation achieved to all habitable rooms.** **Mechanical ventilation installed to wet areas.** **Mechanical ventilation installed to kitchen,**
Insulation:	**Ceiling batts in place at time of inspection.**
Smoke & Fire Alarms:	**Battery operated smoke alarms installed and tested at time of inspection.**
Hot Water System:	**Gas hot water system.**
Kitchen:	**Wall finishes complete & sealed.** **Floor finishes complete & sealed.** **Fixtures installed and connected.** **Stove/hob clearance: 35mm** **Other (specify): Rangehood: 750mm**
Service Rooms:	**Wall finishes complete & sealed.** **Floor finishes complete and sealed.** **Fixtures installed and operational.** **All fixtures have been sealed.** **Safety glass installed.**
Plumbing & Drainage:	**AAV installed to kitchen waste.** **AAV installed to vanity.** **Water isolation valve location: garage wall** **Floor waste gully installed to: Shower**
Attached Garage:	**Door rebate installed.** **Adequate weather seal achieved.**

Support Documentation — Status

CDOC-AB07 - Foulwater and stormwater drains layouts — Accepted

TRIM://21/140212 Accepted as laid correct address, bcn, CD M Boulton #29791 supervised by R Tapp #24836 , verified - Document(s) can be relied on as author is qualified and holds a current registration - Andrea Morton - 9/2/2021

CDOC-AB01 - Roof truss layout	Required
CDOC-AB02 - Water reticulation - pipework testing	Required
CDOC-CS01 - CS under tile shower or deck tanking/membrane	Required
CDOC-EW01 - Energy work certificate - electrical	Required
CDOC-EW02 - Energy work certificate - gas	Required
CDOC-RBWB - Restricted building work - Brick and block laying	Required
CDOC-RBWC - Restricted building work - Carpentry	Required
CDOC-RBWF - Restricted building work - Foundation	Required
CDOC-RBWR - Restricted building work - Roofing	Required
CDOC-ST01 - Structure - inspections	Required

Isolation valve
Taken at 1:33 PM on Tuesday 6/04/2021

Laundry
Taken at 1:33 PM on Tuesday 6/04/2021

Smoke alarm
Taken at 1:34 PM on Tuesday 6/04/2021

Main bathroom
Taken at 1:34 PM on Tuesday 6/04/2021

Safety glass
Taken at 1:35 PM on Tuesday 6/04/2021

Ensuite
Taken at 1:35 PM on Tuesday 6/04/2021

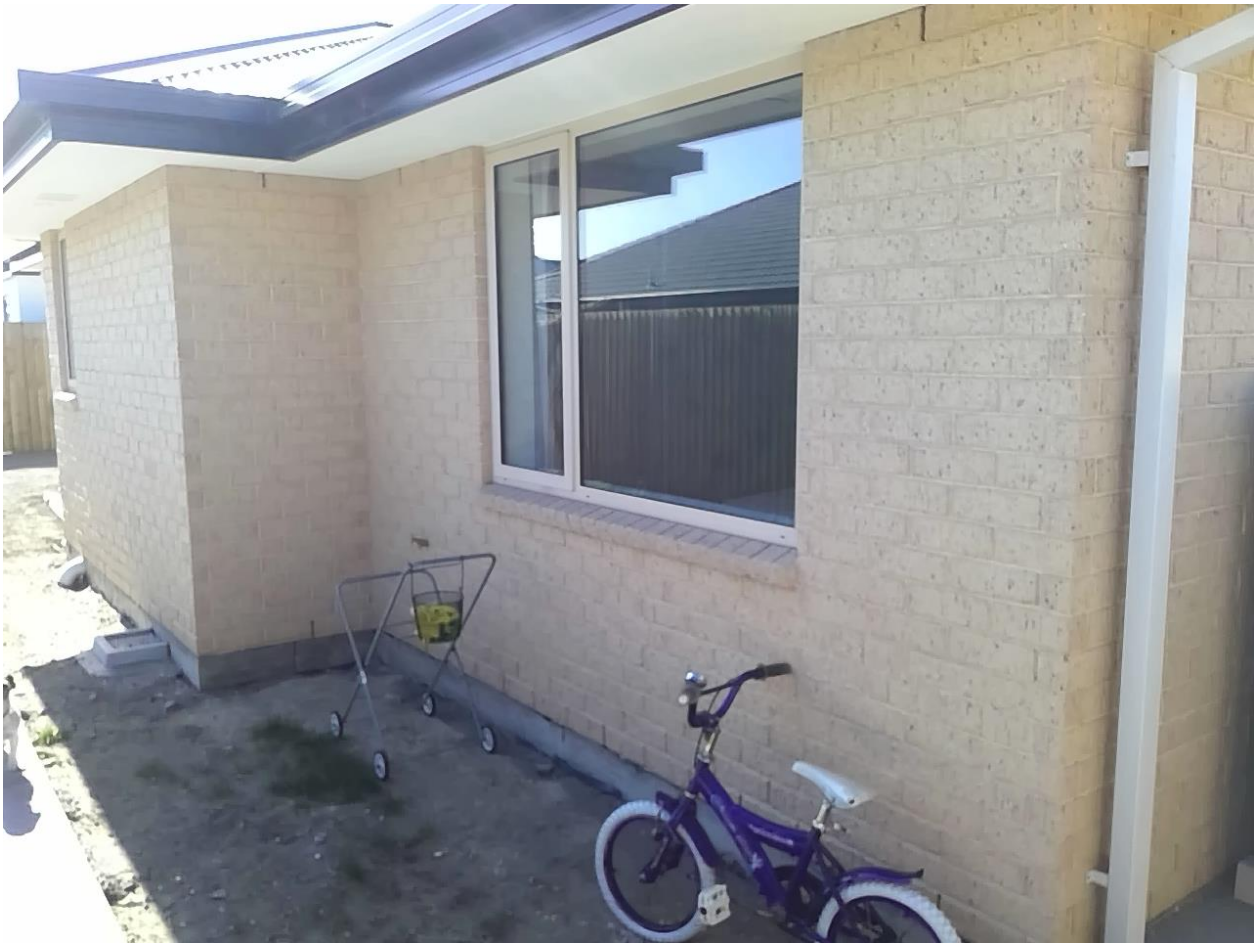
scullary
Taken at 1:36 PM on Tuesday 6/04/2021

Kitchen
Taken at 1:36 PM on Tuesday 6/04/2021

Elevation and gas station
Taken at 1:44 PM on Tuesday 6/04/2021

Elevation
Taken at 1:44 PM on Tuesday 6/04/2021

Gully trap
Taken at 1:44 PM on Tuesday 6/04/2021



elevation
Taken at 1:45 PM on Tuesday 6/04/2021

Elevation
Taken at 1:45 PM on Tuesday 6/04/2021

Elevation
Taken at 1:46 PM on Tuesday 6/04/2021

Elevation
Taken at 1:46 PM on Tuesday 6/04/2021

Bubble up sump
Taken at 1:52 PM on Tuesday 6/04/2021

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 08 Apr 2021 00:10AM

BCN/2020/10038

Details: BCN/2020/10038	
Application number	BCN/2020/10038
Address	8 Hoffman Street Burwood
CCC application received date	06 April 2021
CCC application accepted date	
CCC Refused S95 date	
CCC Refused S93 date	
Description	Construction of dwelling with attached garage
Complexity	Complexity residential 2
Application type	Residential detached dwelling
Building Consent issued date	29 October 2020
BCO name	Cate McPherson
Auditor's name	
Stage	

Related Stage(s) Building Consents to: BCN/2020/10038

Consent number	Stage	Status	BC issued date
	No records returned		

Minor Variation: BCN/2020/10038

Received date	Decision	Decision date	To be invoiced
	No records returned		
Total Minor Variation processing fee			**$0.00**
Minor Variation invoiced amount			**$0.00**
Total to be invoiced			**$0.00**

Amendments: BCN/2020/10038

Consent number	Status	Description
		No records returned

Address related building consents: BCN/2020/10038

Consent number	CCC issued	Status	Description
			No records returned

Section 37: BCN/2020/10038

Type	Lapsed date	Lapsed	Status
Section 37 Other Consents Required	15 Oct 2020	Lapsed	

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 08 Apr 2021 00:10AM

BCN/2020/10038

Address related resource consents: BCN/2020/10038				
Consent number	**Type**	**Issued date**	**Description**	**Status**
			No records returned	

Section 36: BCN/2020/10038			
DC Assessment Result	**Value of DC Assessment**	**Comment**	**Memo**
No DC to pay			No DCs to pay: Nil DC assessment.New residential unit on proposed allotment.DCs to be paid under subdivision.No additional HUE demand.Kelly

Notice to fix: BCN/2020/10038			
Type	**Notice to fix received date**	**Notice to fix latest decision**	**Notice to fix latest decision date**
No records returned			

Certificate of public use: BCN/2020/10038			
Type	**CPU received date**	**CPU issued date**	**CPU expiry date**
No records returned			

Compliance Schedule: BCN/2020/10038				
WOF number	**WOF property address**	**Description**	**Latest expiry date for each WOF**	**Responsible officer**
		No records returned		

Memos: BCN/2020/10038			
Description	**Urgent**	**Summary**	**Memo**
Development contributions memo		No DCs to pay	Nil DC assessment.New residential unit on proposed allotment.DCs to be paid under subdivision.No additional HUE demand.Kelly
Building Class General Memo		Builder's contact details	Caleb Ayers cellphone is 02041785114 and his email is bugs4dragons2@gmail.com.
Data from Online Services		Application Lodgement	Information Not Updated into PathwayLodgement Date Time : >2020-09-30T20:49:10.3975982+13:00< Email Address : >ascadltd@snap.net.nz<

Inspections status: BCN/2020/10038				
Inspection type	**Description**	**Result**	**Date**	**Status**
210 - Final Inspection	**Actual**	**Pass**	**06 Apr 2021**	
205 - Pre Line (Pre Line including Plumbing)	Actual	Pass	02 Feb 2021	

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 08 Apr 2021 00:10AM

BCN/2020/10038

211 - Half High Masonry (Half High Brick)	Actual	Pass	25 Jan 2021	
216 - Interior Tanking (Pre Tile Tanking)	Actual	Pass	05 Mar 2021	
217 - Pre Roof	Actual	Pass	01 Dec 2020	
251 - Foundation or Slab	Actual	Pass	10 Nov 2020	
252 - Drainage	Actual	Pass	16 Nov 2020	
253 - Pre Cladding	Actual	Pass	18 Jan 2021	

Inspection history: BCN/2020/10038

Click for the Inspection Reconciliation Report

Inspection date	Type	Result	Duration (hrs)
10 Nov 2020	251 - Foundation or Slab	Pass	1.00
16 Nov 2020	252 - Drainage	Pass	0.75
01 Dec 2020	217 - Pre Roof	Pass	0.75
18 Jan 2021	253 - Pre Cladding	Pass	0.75
25 Jan 2021	211 - Half High Masonry (Half High Brick)	Pass	0.50
02 Feb 2021	205 - Pre Line (Pre Line including Plumbing)	Pass	0.75
05 Mar 2021	216 - Interior Tanking (Pre Tile Tanking)	Pass	0.75
06 Apr 2021	210 - Final Inspection	Pass	0.75

Supporting documentation: BCN/2020/10038

Code	Description	Document Status	Accepted Date	Trimlink	Decision	Status
COMPLY-00	No compliance schedule required	Not required				
CDOC-AB07	Foulwater and stormwater drains layouts	Accepted	09 Feb 2021	TRIM://21/140212	TRIM://21/140212 Accepted as laid correct address, bcn, CD M Boulton #29791 supervised by R Tapp #24836 , verified - Document(s) can be relied on as author is qualified and holds a current registration - Andrea Morton - 9/2/2021	
CDOC-AB01	Roof truss layout	Required				
CDOC-AB02	Water reticulation - pipework testing	Required				
CDOC-CS01	CS under tile shower or deck tanking/membrane	Required				
CDOC-EW01	Energy work certificate - electrical	Required				
CDOC-EW02	Energy work certificate - gas	Required				

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 08 Apr 2021 00:10AM

BCN/2020/10038

CDOC-RBWB	Restricted building work - Brick and block laying	Required				
CDOC-RBWC	Restricted building work - Carpentry	Required				
CDOC-RBWF	Restricted building Work - Foundation	Required				
CDOC-RBWR	Restricted building work - Roofing	Required				
CDOC-ST01	Structure - inspections	Required				

Invoices and credit notes: BCN/2020/10038

Invoice number	Amount ($) (inclusive of GST)	Fee type description	Fee type	Customer name	Customer number
192065	2,800.00	Building consent - deposit (non-refundable	MINRES	LYNLEY CLAIRE BUNN	3139218
194038	39.60	Accept	ACCEPR	LYNLEY CLAIRE BUNN	3139218
194038	151.20	Accreditation levy	ACCLEV	LYNLEY CLAIRE BUNN	3139218
194038	661.50	Building levy (MBIE)	BLDLEV	LYNLEY CLAIRE BUNN	3139218
194038	1,600.00	Inspection residential	INSPEC	LYNLEY CLAIRE BUNN	3139218
194038	1,284.40	Process and grant	PROCER	LYNLEY CLAIRE BUNN	3139218
194038	378.00	Building research levy (BRANZ)	BRELEV	LYNLEY CLAIRE BUNN	3139218
194038	149.40	Pre-acceptance technical review	PREACR	LYNLEY CLAIRE BUNN	3139218
194038	360.00	CCC Grant and issue dwelling	CCCDWE	LYNLEY CLAIRE BUNN	3139218
194038	52.00	Electronic file management	ELECFR	LYNLEY CLAIRE BUNN	3139218
194038	156.00	Vehicle crossing inspection	VEHICL	LYNLEY CLAIRE BUNN	3139218
194038	1,044.75	Standard water connection	WATRCS	LYNLEY CLAIRE BUNN	3139218
194038	383.90	Development check	DEVCHK	LYNLEY CLAIRE BUNN	3139218
557332	-2,800.00	Building consent - deposit (non-refundable	MINRES	LYNLEY CLAIRE BUNN	3139218
557334	-156.00	Vehicle crossing inspection	VEHICL	LYNLEY CLAIRE BUNN	3139218
Subtotal	**0.00**	**Development contribution**			
Subtotal	**$6,104.75**	**Other fees**			
Total amount	**$6,104.75**				

Receipts: BCN/2020/10038

Connect receipt number	Amount ($) (inclusive of GST)	Gems receipt number	Receipt date	Payee Name	Receipt Description
281475	2,800.00		02 Oct 2020	Unknown	Debtors Receipt

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 08 Apr 2021 00:10AM

BCN/2020/10038

284445	3,304.75		29 Oct 2020	Unknown	Debtors Receipt
Total amount	**$6,104.75**				

Code Compliance Summary

DETAILS					
Property Address:	8 Hoffman Street Burwood				
Consent Issue Date:	**Building Consent Number:**		**Project Description:**		
29/10/2020 1:00:48 PM	BCN/2020/10038		Construction of dwelling with attached garage		
Building level: ☐ R1 ☑ R2 ☐ R3 ☐ C1 ☐ C2 ☐ C3					
Vetting officer:	Name:	Tracey Atherton	**Date Vetting officer Pre-acceptance completeness check started:***		2021-04-08
Property file ordered?	☐ Yes ☑ N/A - e-copy in TRIM		**Date Property file ordered** *(if applicable)*:		
CC Assessor:	Name:	Michelle Lisle	**Date CC Assessor process started:**		14-04-201
	Competency:	Res 1-3 and Com 1-3			
Historic consents process only					
Senior Building Inspector:	Name:		**Building Inspector:**	Name:	
	Competency:			Competency:	
Risk Level:	☐ Low ☐ High	**Reason for level decision:** [*Note: if a compliance schedule review is required]*			

Phone 1st:	**Agent**	
	Owner	

Key for abbreviations to answering processing questions:	
Y	Yes - the application meets the full intent of the question. Provide comment as appropriate.
N	No - the application does not meet the full intent of the question. Provide comment as appropriate.
N/A	Not applicable - the question is not applicable to this application. Provide comment as appropriate.

SECTION 1: VETTING & ALLOCATION INITIAL COMPLETENESS CHECK

Application for Code Compliance: All required sections of application form completed and signed? *[If owner has changed Certificate of Title is required]*	Y	21/411704 CD – 31/03/2021
If the proposed building work includes 'restricted building work' has an appropriate 'records of work' been provided for all of the proposed 'restricted building work' by each LBP, Architect or Engineer? *[Note received ROWs below and lapse in Connect]*	Y	

Type of Restricted Building Work:		**LBP Licence Class:**	**LBP Name and Licence Number:**	**LBP Rego Current?**	**TRIM Ref:**
Wall Cladding or Wall Cladding Systems		Brick & Blocklaying License	Allen Hyett - 122581	☑	21/411704
Walls	Roof, columns and beams, bracing, wall cladding	Carpentry License	G J Bills - 105031	☑	21/411704
Foundations & Subfloor Framing		Carpentry License	Dave Henry - 105650	☑	21/411704
Roof Cladding or Roof Cladding System		Roofing License	Greg Sutherland - 122504	☑	21/411704
select		select		☐	
select		select		☐	
select		select		☐	
select		select		☐	
select		select		☐	
select		select		☐	

Have Energy Certificates been provided? *(e.g. House; Heating, Gas)* *[Lapse in Connect and record HPRM ref]*	Y	Electrical – fitoff – ESC – Isaac Friedauer E257183 – confirmed and accepted - 21/411704 Gas – GSC – James Price 10922 – confirmed and accepted - 21/411704

SECTION 1a: INITIAL COMPLETENESS CHECK DECISION

I confirm that the Vetting & Allocation initial completeness checks have been completed and that the Code Compliance Certificate application is:

☑ **ACCEPTED**

☐ **NOT ACCEPTED** - the reason for non-accepted is:

Signed by the Vetting & Allocation Officer and also confirms that checks are completed and that all relevant information in Section 11 (marked with an *) is contained in the building consent file :

	**Date:** 2021-04-08

RECORD ANY PREVIOUS "NOT ACCEPTED" DECISIONS - If N/A please Not Applicable		
Date	**V&A Officer**	**Reason for non-acceptance**

Code Compliance Assessor to complete – insert relevant data from 025 CCC Statement of Compliance:			
Minor Variations: No records returned			**Details:**
Amendments: No records returned			**Details:**
Other Consents: No records returned			**Details:**
Section 37 required: select			**Details:**
Section 37 Other Consents Required	15 Oct 2020	Lapsed	
Resource Consents: No records returned			**Details:**
Development Contributions: N/A			**Details:**
Warnings and Bans: No			**Details:**
Certificates for Public Use: No			**Details:**
Compliance Schedule required: N/A			**BWOF Officer Name:**
			BWOF Number
General Comments: *[Include any applicable Connect memo's]* 025 Statement of Compliance used: TRIM:// 21/447717 - Michelle Lisle – 14-04-2021			

SECTION 2: INSPECTIONS – insert 'Inspection status' and table from 025 CCC Statement of Compliance: *[if a Staged Consent, include all tables]*

Inspections status: BCN/2020/10038				
Inspection type	**Description**	**Result**	**Date**	**Status**

210 - Final Inspection	Actual	Pass	06 Apr 2021	
205 - Pre Line (Pre Line including Plumbing)	Actual	Pass	02 Feb 2021	
211 - Half High Masonry (Half High Brick)	Actual	Pass	25 Jan 2021	
216 - Interior Tanking (Pre Tile Tanking)	Actual	Pass	05 Mar 2021	
217 - Pre Roof	Actual	Pass	01 Dec 2020	
251 - Foundation or Slab	Actual	Pass	10 Nov 2020	
252 - Drainage	Actual	Pass	16 Nov 2020	
253 - Pre Cladding	Actual	Pass	18 Jan 2021	

Inspection history: BCN/2020/10038

Click for the Inspection Reconciliation Report

Inspection date	Type	Result	Duration (hrs)
10 Nov 2020	251 - Foundation or Slab	Pass	1.00
16 Nov 2020	252 - Drainage	Pass	0.75
01 Dec 2020	217 - Pre Roof	Pass	0.75
18 Jan 2021	253 - Pre Cladding	Pass	0.75
25 Jan 2021	211 - Half High Masonry (Half High Brick)	Pass	0.50
02 Feb 2021	205 - Pre Line (Pre Line including Plumbing)	Pass	0.75
05 Mar 2021	216 - Interior Tanking (Pre Tile Tanking)	Pass	0.75
06 Apr 2021	210 - Final Inspection	Pass	0.75

SECTION 3: INSPECTION HISTORY	Y / N	Comments, Dates, Details
All required inspection types identified as passed:	Y	
Total Prepaid Inspections:	8	1,600.00
Total Inspections Completed:	8	1,600.00
Total Fee:	Zero Balance	**$**

Additional Comments: *[Please list TRIM links to Cost Breakdown information and Inspection Calculations documentation]*
TRIM:// 21/447766 reconciliation
Modification of durability [Performance requirement B2.3.1] – If N/A please Not Applicable
Substantial completion of building work: *[Refer to audit or final inspection report confirming substantial completion date i.e. month & year]*

SECTION 4: DOCUMENTATION SUMMARY

Documentation Status:	Action / TRIM link and notes:	
Construction Statement – B-083	**Action:** N/A	
	TRIM link and Assessor Notes:	
Plumbing – B-084:	**Action:** CC Assessor Accepted	
	TRIM link and Assessor Notes:	TRIM:// 21/411704 Accepted – page 77 **B-084** filled out correctly – BCN - Signed by Christopher Ny Registration recorded as 14758 on 25/3/2021 – Checked - Michelle Lisle – 14-04-2021
Surveyors Certificate (Siting, HIRB, FFL):	**Action:** N/A	
	TRIM link and Assessor Notes:	
Construction Review (PS4 and Site Inspections): *[If applicable, record consultant name]*	**Action:** CC Assessor Accepted	
	TRIM link and Assessor Notes:	TRIM:// 21/411704 page 30 PS1 RFI TRIM:// 21/465389 Accepted – ENGCO **PS4 and site inspection records** – CM2 and B1 - BCN - Sighted Building consents and conditions - Signed by Matthew Cusiel on 10.11.2020 – Registration recorded as 161509 – Checked – Michelle Lisle – 16-04-2021
Façade inspections (PS4 and Site Inspections): *[If applicable, record consultant name]*	**Action:** N/A	
	TRIM link and Assessor Notes:	
Drainage Systems (As built):	**Action:** Document Assessor Accepted (pre CCC application)	
	TRIM link and Notes:	TRIM://21/140212 Accepted as laid correct address, bcn, CD M Boulton #29791 supervised by R Tapp #24836 , verified - Document(s) can be relied on as author is qualified and holds a current registration - Andrea Morton - 9/2/2021
Exterior Cladding (PS3): *[If applicable, record the system]*	**Action:** N/A	
	TRIM link and Notes:	
Membrane – External, e.g., Roof and Decks	**Action:** N/A	

SECTION 4: DOCUMENTATION SUMMARY			
Documentation Status:		**Action / TRIM link and notes:**	
(PS3):		**TRIM link and Notes:**	
Membrane – Internal, e.g., Shower (PS3):		**Action:** CC Assessor Accepted	
		TRIM link and Notes:	TRIM:// 21/411704 Accepted – page 63 **PS3** – MPsquared Tiling - BCN – B2, E3 – Signed by Matthew Machirus Registration recorded as 1116 on 20/03/2021 - experience accepted - Michelle Lisle – 14-04-2021
As-built Truss Design:		**Action:** CC Assessor Accepted	
		TRIM link and Notes:	TRIM:// 21/411704 Accepted – page 67 **As-built** Truss Design - BCN - job no PC20232 - Michelle Lisle – 14-04-2021
Penetrations through fire separations:		**Action:** N/A	
		TRIM link and Notes:	
Intumescent paint:		**Action:** N/A	
		TRIM link and Notes:	
Potable water test certificate (not NUO): *[If applicable, record consultant name]*		**Action:** N/A	
		TRIM link and Notes:	
On-site disposal systems (PS3):		**Action:** N/A	
		TRIM link and Notes:	
Pressure sewer system (B082):		**Action:** N/A	
		TRIM link and Notes:	
Section 77 Registered:		**Action:** N/A	
		TRIM link and Notes:	
Staged Consent: *[If applicable, ensure that the RFI references this]*		**Action:** N/A	
		TRIM link and Notes:	
Other:		**Action:** N/A	
		TRIM link and Notes:	
Other:		**Action:** select	
		TRIM link and Notes:	

SECTION 4: DOCUMENTATION SUMMARY

Documentation Status:		Action / TRIM link and notes:	
Other:		**Action:** select	
		TRIM link and Notes:	
Other:		**Action:** select	
		TRIM link and Notes:	
Other:		**Action:** select	
		TRIM link and Notes:	
Other:		**Action:** select	
		TRIM link and Notes:	
Other:		**Action:** select	
		TRIM link and Notes:	
Notes:			
Only the above producer statements have been considered for reliance. If other producer statements have been provided voluntarily, they will be saved in the consent file in TRIM, but not reviewed or relied upon.			

SECTION 5: DOCUMENTATION SUMMARY – SPECIFIED SYSTEMS – If n/a please N/A

Documentation Status:	Action / TRIM link / Notes:	
1 Automatic systems for fire suppression: **- (PS3):**	**Action:** select	
	TRIM link and Notes:	
- (Certificate of Compliance):	**Action:** select	
	TRIM link and Notes:	
2 Automatic or manual emergency warning systems for fire or other dangers: **- (PS3):**	**Action:** select	
	TRIM link and Notes:	
- (Certificate of Compliance):	**Action:** select	
	TRIM link and Notes:	
3/1) Automatic doors:	**Action:** select	

SECTION 5: DOCUMENTATION SUMMARY – SPECIFIED SYSTEMS – If n/a please N/A		
	TRIM link and Notes:	
3/2) Access control doors:	**Action:** select	
	TRIM link and Notes:	
3/3) Automatic fire doors:	**Action:** select	
	TRIM link and Notes:	
4 Emergency lighting systems (PS3)	**Action:** select	
	TRIM link and Notes:	
4 Emergency lighting systems (PS4)	**Action:** select	
	TRIM link and Notes:	
5 Escape route pressurisation systems:	**Action:** select	
	TRIM link and Notes:	
6 Hydrant System/Riser mains:	**Action:** select	
	TRIM link and Notes:	
7 Automatic backflow preventers connected to potable water supply:	**Action:** select	
	TRIM link and Notes:	
8/1, 8/2, 8/3 Lifts, Escalators, travelators, or other systems for moving people within buildings:	**Action:** select	
	TRIM link and Notes:	
9 Mechanical ventilation or air conditioning systems (HVAC):	**Action:** select	
	TRIM link and Notes:	
10 Building maintenance units providing access to the exterior and interior walls of buildings:	**Action:** select	
	TRIM link and Notes:	
11 Laboratory fume cupboards:	**Action:** select	
	TRIM link and Notes:	
12/1, 12/2 Auto loops or other assistive listening systems:	**Action:** select	
	TRIM link and Notes:	

SECTION 5: DOCUMENTATION SUMMARY – SPECIFIED SYSTEMS – If n/a please N/A		
13/1, 13/2 Natural/Mechanical smoke control systems, smoke curtains:	**Action:** select	
	TRIM link and Notes:	
14/1) Emergency power systems:	**Action:** select	
	TRIM link and Notes:	
14/2) Signs relating to, a system or feature specified in any of clauses above:	**Action:** select	
	TRIM link and Notes:	
15/1) Systems for Communicating spoken information intended to facilitate evacuation:	**Action:** select	
	TRIM link and Notes:	
15/2) Final exits(as defined by clause A2 of the Building Code); and	**Action:** select	
	TRIM link and Notes:	
15/3) Fire separations (as so defined); and	**Action:** select	
	TRIM link and Notes:	
15/4) Signs for communicating information intended to facilitate evacuation; and	**Action:** select	
	TRIM link and Notes:	
15/5) Smoke separations (as so defined):	**Action:** select	
	TRIM link and Notes:	
Fire Engineer PS4:	**Action:** select	
	TRIM link and Notes:	
Other:	**Action:** select	
	TRIM link and Notes:	
Other:	**Action:** select	
	TRIM link and Notes:	
Other:	**Action:** select	
	TRIM link and Notes:	
Other:	**Action:** select	

SECTION 5: DOCUMENTATION SUMMARY – SPECIFIED SYSTEMS – If n/a please N/A

	TRIM link and Notes:	
Other:	**Action:** select	
	TRIM link and Notes:	
Other:	**Action:** select	
	TRIM link and Notes:	

Compliance Schedule Review:

select

Documentation Notes:

Only the above producer statements have been considered for reliance. If other producer statements have been provided voluntarily, they will be saved in the consent file in TRIM, but not **reviewed or relied upon.**

SECTION 6: CHARGES

Notice to Fix -	**occurrences:**	**$**
CCC Building Inspections	**21/447766** **occurrences:**	**$** 0.00
Code Compliance Re Application Fee (S95):		**$**
Code Compliance Additional processing	21/465676	**$** 0.00
Reminder:	*Include 30 minutes additional processing time for issuing the Code Compliance Certificate* *Include 60 minutes additional processing time for issuing the Compliance Schedule*	
Minor Variation	**occurrences:**	**$**
Amendment to modify building code clause B2 – Durability (deposit)		**$**
Other:		**$**
	select	**$** 0.00

*** Code Compliance must be issued before Refunds are processed**
*** Funds owed/refunded may be adjusted in the event of a failed final inspection**

Additional Comments: *[Please list TRIM links to any additional Chargeable Services and Processing Reconciliation documentation]*

SECTION 7: INVOICING / REFUNDS

Invoice / Credit Note Number:	**Amount:**	**Type:**	**Date Sent:**	**Sent to:**	**Date Paid:**	**TRIM Ref:** *[Insert TRIM link to Invoice / Credit Note]*

SECTION 8: ADDITIONAL COMMENTS

Officer's Note:

SECTION 9: FINAL CODE COMPLIANCE APPLICATION SIGN OFF

Matters for consideration by building consent authority in deciding to issue a code compliance certificate

DECISION – Select yes if you agree, or no if you disagree with the applicable statement below. Select N/A for the statement that is not applicable

y **: Section 94** (for building consents granted under the Building Act 2004)

On the basis of the satisfactory completion of inspections (including verification that all the construction documentation requested with the building consent has been provided) I, on behalf of the Christchurch City Council, am satisfied on reasonable grounds that the building work complies with the building consent and that in a case where a compliance schedule (or an amendment to an existing compliance schedule) is required as a result of the building work, the specified systems in the building (or that are being altered in, or added to, the building in the course of the building work) are capable of performing to the performance standards set out in the building consent. Consideration also has been made that the requirements of section 94 (2), (3) and (4) have been met

OR

N/A **: Section 436** (for building consents granted under the Building Act 1991)

On the basis of the satisfactory completion of inspections (including verification that all the construction documentation requested with the building consent has been provided) I, on behalf of the Christchurch City Council, am satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted.

Issue of code compliance certificate or refusal to issue code compliance certificate

y **: Section 95 Issue of code compliance certificate**

On the basis of the decision above the code compliance certificate must be issued by Christchurch City Council on the prescribed form on payment of any fees and charges imposed by the building consent authority under section 219 or 240

OR

N/A **: Section 95A Refusal to issue code compliance certificate**

On the basis of the decision above the Christchurch City Council refuses to issue a code compliance certificate, and must give the applicant written notice of the refusal; and the reasons for the refusal.

Name:	
Date:	
Select option above (issue or refusal) and sign:	**Signature:**

	 Michelle Lisle Code Compliance Assessor 16/04/2021 02:24 pm

SECTION 10: SUPERVISION - If n/a please N/A	
	Comments:
Record details of **supervision** by competent Code Compliance Assessor where building category is above or outside Assessor's competency level. ***Provide competent officer's name and date of 'sign-off'.***	**Signature:**

Section 11: Code Compliance Assessor Final Procedures Checklist: **CONFIRMATION THAT ALL RELEVANT INFORMATION IS CONTAINED IN THE BUILDING CONSENT FILE**	**Located: Y / N / NA**
*** B-011 Application for Code Compliance Certificate (Form 6)**	Y
*** Record of Work(s) by licensed building practitioners (Form 6A, B, C)**	Y
*** Energy works certificates**	Y
B-013 Application for Certificate for Public Use (Form 15)	N/A
B-450 Certificate for Public Use (Form 16)	N/A
B-440 Notice to Fix (Form 13)	N/A
B-460 Compliance Schedule statement (building warrant of fitness) (Form 10)	N/A
B-461 Section 1 Compliance Schedule	N/A
Dangerous/EQ prone/Insanitary Building notices (section 124 notices)	N/A
Producer statement construction (PS3) / Producer statement construction reviews (PS4)	y
Inspections records and evidence	y
Minor variation documentation	N/A
Summary of written complaints	N/A

B-006 Application for amendment to building consent for modification of durability periods to clause B2.3.1	N/A
B-410 amended building consent subject to a modification of B2.3.1	N/A
B-140 Notification of Waiver or Modification of the Building Code	N/A
Copy of invoices	N/A
All email/letter/faxed correspondence relative to the individual consent	y
Staged building consents – All stages completed	N/A
B-451 Code Compliance Certificate (Form 7)	y
FINAL TASK CHECKLIST:	
Have all workflows been completed in connect and final administration completed	y
All CCC documents have been converted to PDFs	y
All building consent file documents are made 'public' and 'finalised'	y
If the application is commercial structural strengthening/upgrade related, email a copy of the B451 and relevant PS4 to DEEs@ccc.govt.nz	N/A
If the application includes a pressure sewer system, email the BCN, address and As-Built drainage trim reference to asset.handover2@ccc.govt.nz	N/A

Confirmed by the Code Compliance Assessor that all relevant information in Section 11 (not marked with an *) is contained in the building consent file:

Name:	Michelle Lisle
Date:	16-04-2021

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 14 Apr 2021 00:10AM

BCN/2020/10038

Details: BCN/2020/10038	
Application number	BCN/2020/10038
Address	8 Hoffman Street Burwood
CCC application received date	06 April 2021
CCC application accepted date	06 April 2021
CCC Refused S95 date	
CCC Refused S93 date	
Description	Construction of dwelling with attached garage
Complexity	Complexity residential 2
Application type	Residential detached dwelling
Building Consent issued date	29 October 2020
BCO name	Cate McPherson
Auditor's name	
Stage	

Related Stage(s) Building Consents to: BCN/2020/10038

Consent number	Stage	Status	BC issued date
	No records returned		

Minor Variation: BCN/2020/10038

Received date	Decision	Decision date	To be invoiced
	No records returned		
Total Minor Variation processing fee			**$0.00**
Minor Variation invoiced amount			**$0.00**
Total to be invoiced			**$0.00**

Amendments: BCN/2020/10038

Consent number	Status	Description
		No records returned

Address related building consents: BCN/2020/10038

Consent number	CCC issued	Status	Description
			No records returned

Section 37: BCN/2020/10038

Type	Lapsed date	Lapsed	Status
Section 37 Other Consents Required	15 Oct 2020	Lapsed	

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 14 Apr 2021 00:10AM

BCN/2020/10038

Address related resource consents: BCN/2020/10038

Consent number	Type	Issued date	Description	Status
			No records returned	

Section 36: BCN/2020/10038

DC Assessment Result	Value of DC Assessment	Comment	Memo
No DC to pay			No DCs to pay: Nil DC assessment.New residential unit on proposed allotment.DCs to be paid under subdivision.No additional HUE demand.Kelly

Notice to fix: BCN/2020/10038

Type	Notice to fix received date	Notice to fix latest decision	Notice to fix latest decision date
No records returned			

Certificate of public use: BCN/2020/10038

Type	CPU received date	CPU issued date	CPU expiry date
No records returned			

Compliance Schedule: BCN/2020/10038

WOF number	WOF property address	Description	Latest expiry date for each WOF	Responsible officer
		No records returned		

Memos: BCN/2020/10038

Description	Urgent	Summary	Memo
Development contributions memo		No DCs to pay	Nil DC assessment.New residential unit on proposed allotment.DCs to be paid under subdivision.No additional HUE demand.Kelly
Building Class General Memo		Builder's contact details	Caleb Ayers cellphone is 02041785114 and his email is bugs4dragons2@gmail.com.
Data from Online Services		Application Lodgement	Information Not Updated into PathwayLodgement Date Time : >2020-09-30T20:49:10.3975982+13:00< Email Address : >ascadltd@snap.net.nz<

Inspections status: BCN/2020/10038

Inspection type	Description	Result	Date	Status
210 - Final Inspection	**Actual**	**Pass**	**06 Apr 2021**	●
205 - Pre Line (Pre Line including Plumbing)	Actual	Pass	02 Feb 2021	●

Christchurch City Council

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Data current as of : 14 Apr 2021 00:10AM

BCN/2020/10038

211 - Half High Masonry (Half High Brick)	Actual	Pass	25 Jan 2021	
216 - Interior Tanking (Pre Tile Tanking)	Actual	Pass	05 Mar 2021	
217 - Pre Roof	Actual	Pass	01 Dec 2020	
251 - Foundation or Slab	Actual	Pass	10 Nov 2020	
252 - Drainage	Actual	Pass	16 Nov 2020	
253 - Pre Cladding	Actual	Pass	18 Jan 2021	

Inspection history: BCN/2020/10038

Click for the Inspection Reconciliation Report

Inspection date	Type	Result	Duration (hrs)
10 Nov 2020	251 - Foundation or Slab	Pass	1.00
16 Nov 2020	252 - Drainage	Pass	0.75
01 Dec 2020	217 - Pre Roof	Pass	0.75
18 Jan 2021	253 - Pre Cladding	Pass	0.75
25 Jan 2021	211 - Half High Masonry (Half High Brick)	Pass	0.50
02 Feb 2021	205 - Pre Line (Pre Line including Plumbing)	Pass	0.75
05 Mar 2021	216 - Interior Tanking (Pre Tile Tanking)	Pass	0.75
06 Apr 2021	210 - Final Inspection	Pass	0.75

Supporting documentation: BCN/2020/10038

Code	Description	Document Status	Accepted Date	Trimlink	Decision	Status
COMPLY-00	No compliance schedule required	Not required				
CDOC-AB07	Foulwater and stormwater drains layouts	Accepted	09 Feb 2021	TRIM://21/140212	TRIM://21/140212 Accepted as laid correct address, bcn, CD M Boulton #29791 supervised by R Tapp #24836 , verified - Document(s) can be relied on as author is qualified and holds a current registration - Andrea Morton - 9/2/2021	
CDOC-EW01	Energy work certificate - electrical	Accepted	08 Apr 2021	TRIM://21/411704	TRIM://21/411704 Accepted - Document(s) can be relied on as author is qualified and holds a current registration - Tracey Atherton - 2021-04-08	
CDOC-EW02	Energy work certificate - gas	Accepted	08 Apr 2021	TRIM://21/411704	TRIM://21/411704 Accepted - Document(s) can be relied on as author is qualified and holds a current registration - Tracey Atherton - 2021-04-08	
CDOC-RBWB	Restricted building work - Brick and block laying	Accepted	08 Apr 2021	TRIM://21/411704	TRIM://21/411704 Accepted - Document(s) can be relied on as author is qualified and holds a	

					current registration - Tracey Atherton - 2021-04-08	
CDOC-RBWC	Restricted building work - Carpentry	Accepted	08 Apr 2021	TRIM://21/411704	TRIM://21/411704 Accepted - Document(s) can be relied on as author is qualified and holds a current registration - Tracey Atherton - 2021-04-08	
CDOC-RBWF	Restricted building Work - Foundation	Not required			Not Required - Covered by Carpentry ROW - Tracey Atherton - 2021-04-08	
CDOC-RBWR	Restricted building work - Roofing	Accepted	08 Apr 2021	TRIM://21/411704	TRIM://21/411704 Accepted - Document(s) can be relied on as author is qualified and holds a current registration - Tracey Atherton - 2021-04-08	
CDOC-AB01	Roof truss layout	Required				
CDOC-AB02	Water reticulation - pipework testing	Required				
CDOC-CS01	CS under tile shower or deck tanking/membrane	Required				
CDOC-ST01	Structure - inspections	Required				

Invoices and credit notes: BCN/2020/10038

Invoice number	Amount ($) (inclusive of GST)	Fee type description	Fee type	Customer name	Customer number
192065	2,800.00	Building consent - deposit (non-refundable	MINRES	LYNLEY CLAIRE BUNN	3139218
194038	39.60	Accept	ACCEPR	LYNLEY CLAIRE BUNN	3139218
194038	151.20	Accreditation levy	ACCLEV	LYNLEY CLAIRE BUNN	3139218
194038	661.50	Building levy (MBIE)	BLDLEV	LYNLEY CLAIRE BUNN	3139218
194038	1,600.00	Inspection residential	INSPEC	LYNLEY CLAIRE BUNN	3139218
194038	1,284.40	Process and grant	PROCER	LYNLEY CLAIRE BUNN	3139218
194038	378.00	Building research levy (BRANZ)	BRELEV	LYNLEY CLAIRE BUNN	3139218
194038	149.40	Pre-acceptance technical review	PREACR	LYNLEY CLAIRE BUNN	3139218
194038	360.00	CCC Grant and issue dwelling	CCCDWE	LYNLEY CLAIRE BUNN	3139218
194038	52.00	Electronic file management	ELECFR	LYNLEY CLAIRE BUNN	3139218
194038	156.00	Vehicle crossing inspection	VEHICL	LYNLEY CLAIRE BUNN	3139218
194038	1,044.75	Standard water connection	WATRCS	LYNLEY CLAIRE BUNN	3139218
194038	383.90	Development check	DEVCHK	LYNLEY CLAIRE BUNN	3139218
557332	-2,800.00	Building consent - deposit (non-refundable	MINRES	LYNLEY CLAIRE BUNN	3139218

Christchurch City Council

025 CCC Statement of Compliance

Data current as of : 14 Apr 2021 00:10AM

BCN/2020/10038

557334	-156.00	Vehicle crossing inspection	VEHICL	LYNLEY CLAIRE BUNN	3139218
Subtotal	**0.00**	**Development contribution**			
Subtotal	**$6,104.75**	**Other fees**			
Total amount	**$6,104.75**				

Receipts: BCN/2020/10038

Connect receipt number	Amount ($) (inclusive of GST)	Gems receipt number	Receipt date	Payee Name	Receipt Description
281475	2,800.00		02 Oct 2020	Unknown	Debtors Receipt
284445	3,304.75		29 Oct 2020	Unknown	Debtors Receipt
Total amount	**$6,104.75**				

Inspection Reconciliation Report

Data current as of : 14 Apr 2021 00:10AM

Application Number	BCN/2020/10038
Address	8 Hoffman Street Burwood
BC Issued Date	29-Oct-20
Application Details	Construction of dwelling with attached garage

Total invoiced amount (Inspection) (GST inclusive)	$1,600.00
Total value of completed inspections (GST inclusive)	$1,600.00
Total number of inspections completed	8
Total chargeable duration (hours)	8.00

Completed Inspections

Date	Inspection Description	Result	Chargeable Duration	Inspection Rate ($/hour) (GST inclusive)	Total value of completed inspections (GST inclusive)
10-Nov-20	251 - Foundation or Slab	Pass	1.00	200.00	$200.00
16-Nov-20	252 - Drainage	Pass	1.00	200.00	$200.00
01-Dec-20	217 - Pre Roof	Pass	1.00	200.00	$200.00
18-Jan-21	253 - Pre Cladding	Pass	1.00	200.00	$200.00
25-Jan-21	211 - Half High Masonry (Half High Brick)	Pass	1.00	200.00	$200.00
02-Feb-21	205 - Pre Line (Pre Line including Plumbing)	Pass	1.00	200.00	$200.00
05-Mar-21	216 - Interior Tanking (Pre Tile Tanking)	Pass	1.00	200.00	$200.00
06-Apr-21	210 - Final Inspection	Pass	1.00	200.00	$200.00

Total value of completed inspections (GST inclusive)	$1,600.00
Total invoiced amount (inspection) (GST inclusive)	$1,600.00

Inspection Reconciliation Report

Data current as of : 14 Apr 2021 00:10AM

Additional amount to be invoiced (GST inclusive)	**$0.00**
Refund (GST inclusive)	$0.00

Christchurch City Council

03 941 8999

53 Hereford Street
Christchurch 8011

PO Box 73013
Christchurch 8154

ccc.govt.nz

15 April 2021

L C Bunn

[redacted]

Dear Lynley

Code compliance certificate application – request for information

BCN/2020/10038
8 Hoffman Street Burwood
Construction of dwelling with attached garage

We have received your code compliance certificate application for the above building consent.

We need more information to make sure your building work complies with your approved building consent documents.

The information we need is:

- **Construction monitoring:** Provide all records of inspections and checks carried out, and a PS4 from your nominated structural consultant **ENGCO** stating that all the necessary aspects of their design has been incorporated into the building. This includes but is not limited to the following work:
  - Site Strip
  - Ribraft Slab pre-pour

Can you please send us this information as soon as possible, as your application is now on hold. If we don't hear from you soon we may have to refuse the application under the Building Act 2004.

You can send us the information we have asked for by replying to this email. If you would like to talk to us, you can call the number below.

Please do not lock or password-protect PDFs, as we need to merge them into final consent documents.

This letter is sent to the applicant and the owner, where possible.

Yours sincerely

M. Lisle

Michelle Lisle

Code Compliance Assessor
03 941 5196

B-555 LU 180219 LR 180219 v6

BCN/2020/10038 - 8 Hoffman Street Burwood

Name of employee	Date	Actual Hours	Officer charge out rate	Total	Activity Code	Short Text
Andrea Morton - CCC Assessor	9/02/2021	0.08			CCC Construction Documentation Res	CDOC
		0.08	$ 180.00	$ 14.40		
Michelle Lisle - CCC Assessor	14/04/2021	0.50			CCC Residential	General Processing
Michelle Lisle	16/04/2021	0.25			CCC Residential	document processing
		0.75	$ 180.00	$ 135.00		
Rachel Dowers - V & A Officer	7/04/2021	0.13			CCC Lodgement (Com)	lodgement
		0.13	$ 180.00	$ 23.40		
Tracey Atherton - V & A Officer	8/04/2021	0.25			CCC Vetting (Residential)	vetting
		0.25	$ 180.00	$ 45.00		

Total Processing	$	217.80
CCC Grant and Issue (Prepaid)	-$	360.00
CCC Final Admin (Invoice/Issue)	$	135.00
Total Additional	**-$**	**7.20**

Code Compliance Certificate

Section 95, Building Act 2004 *Form 7 – Building (Forms) Regulations 2004*

Building consent number	BCN/2020/10038	**Date issued**	16 April 2021

The building

Street address of building	8 Hoffman Street Burwood	**Location of building within site/block number**	
Legal description of land where building is located	Lot 460 DP 549008		
Building name		**Level/unit number**	
Year first constructed	2021	**Current, lawfully established use**	Housing - dwelling with attached garage

The owner

Name of owner	L C Bunn	**Phone number**	
Contact person		**Landline**	(027) 490 1323
Mailing address	8 Havana Gardens	**Mobile**	385 1881
Street address / registered office	[redacted] Christchurch 8052	**Fax**	
Email address	lyn390@gmail.com	**Website**	

First point of contact for communications with the building consent authority:

Name	L C Bunn	**Phone**	[redacted]
Contact person	[redacted]		
Mailing address			

Building work

Building consent number **BCN/2020/10038**

Construction of dwelling with attached garage

Issued by: Christchurch City Council

Civic Offices, 53 Hereford Street, Christchurch 8011
PO Box 73013, Christchurch 8154
Phone: 03 941-8999, Fax: 03 941-8792
ccc.govt.nz

Code compliance

The Christchurch City Council is satisfied, on reasonable grounds, that the building work complies with the building consent.

Attachments

Nil

Michelle Lisle

Code Compliance Assessor
03 941 5196

On behalf of: Christchurch City Council

Date: 16 April 2021

Application for a project information memorandum and/or building consent

Section 33 or Section 45, Building Act 2004, *Form 2 - Building (Forms) Regulations 2004*

About this form

- Please check on our website (ccc.govt.nz/building-consent-forms-and-guides) that the form that you are using is current at the time of application as forms are subject to change without notice.
- General information can be found on our website at www.ccc.govt.nz/goahead
- A building consent is the formal approval issued by a Building Consent Authority (BCA) to ensure certain works meet the requirements of the Building Act 2004, Building Regulations and the New Zealand Building Code.

GENERAL INFORMATION:

- **Application fees and charges:** The latest Building Consents Fee Schedule is available on our website at ccc.govt.nz/fees-building-control or from one of our Council service desk (ccc.govt.nz/contact-us). A building consent will not be issued by the Council until all fees and charges relating to that consent application have been paid in full. When applying for a building consent the costs/charges will vary depending on the time a building consent officer spends processing your consent. Ensure all reasonable information applicable to your application is provided. Requests for further information will impact on the processing time and costs of a consent.
- For general enquiries please phone (03) 941 8999 or email info@ccc.govt.nz
- Christchurch City Council reserves the right, from time to time, to contact customers in regard to the services provided.

SUBMITTING AN APPLICATION:

An application can be lodged via the following methods:

- **Online** via onlineservices.ccc.govt.nz. You will need to register to use Online Services. You can register at onlineservices.ccc.govt.nz
- **Post** (additional costs apply) your application to: Consenting & Compliance Group, PO Box 73013, Christchurch 8154
- **Hand delivered** (additional costs apply) to Civic Offices, 53 Hereford Street, Christchurch Central or dropped off at any Council service desk (ccc.govt.nz/contact-us).

All applications will be checked for completeness prior to acceptance. Please ensure that you have compiled your documents carefully to avoid delays in accepting your application. If your application is incomplete it will not be accepted and the statutory processing timeframe will not start until the missing information has been provided and resubmitted.

*Items marked * are mandatory for all applications.*

1. The building

Street address of building:* *(for structures that do not have a street address, state the nearest street intersection and the distance and direction from that intersection)*

Hoffman Street, Prestons Park

Legal description of land where building is located:* *(state legal description as at the date of application and, if the land is proposed to be subdivided, include details of relevant lot numbers and subdivision consent)*

Lot 460 DP 549008

Building name:

Location of building within site/block number: *(include nearest street access)*

Number of levels:* *(including ground level and any levels below ground)*

1

Level/unit number:

Area: *(total floor area; indicate area affected by the building work if less than the total area)*

Total floor area:*	Existing floor area:	New floor area:
184.7		184.7

Current, lawfully established, use:*
(include number of occupants per level and per use if more than 1)

Year first constructed:

2. The owner [Must be completed for all applications and all details must be the owner's]

Name of owner:* *(include preferred form of address, e.g. Mr, Mrs, Ms, Miss, Dr if an individual)*

Lynley Bunn

Contact person: *(not required if the applicant is an individual)*

Mailing address:*

8 Havana Garden, Christchurch

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
0274901323				

Email address:

Lyn390@gmail.com

Website:

The following evidence of ownership is attached to this application: *(copy of certificate of title, lease, agreement for sale and purchase, or other document showing full name of legal owner(s) of the building)*

A recent copy of certificate of title(s) (less than six months old) and where applicable the following:

☐ Lease ☒ Agreement for sale and purchase ☐Licence or property management agreement

☐ Other document *(showing full name of legal owner(s) of the building)*

Certificate of title(s) are available from the Christchurch City Council for a fee. Required? ☐ Yes ☒ No

3. Agent

Name of agent: *(only required if application is being made on behalf of the owner)*
a.s.c.a.d. ltd

Contact person: *(not required if the applicant is an individual)*
Andrew Siegenthaler

New Zealand Companies Registered Number: *(If applicable - Refer to www.business.govt.nz/companies)*

Mailing address:
59 Warwick Road, RD5, Rangiora 7475

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
033292092				

Email address: ascadltd@snap.net.nz

Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*
Draughtsmen

First point of contact for communications with the council/building consent authority: *(contact details must be in New Zealand)*

☐ Agent ☒ Owner ☐ Other: *(if other specify whom and provide contact details as per above)*

4. Application

***I request that you issue a** ☐ *project information memorandum* / ☒ *project information memorandum and building consent* / ☐ *building consent* **for the building work described in this application.**

This application is for:

☐ Amendment to building consent: *Write building consent numbers of original consent*

☐ Staged building consent – Stage of *Write building consent numbers of previous stages*

For stage 1: Proposals to stage the building work to construct or alter a building are required to be approved by Council prior to lodging the application for a building consent for the first stage. *Please attach evidence of approval of your staging proposal by the Council to your first stage application* (visit our website for more guidance).

For stage 2+: Have you made any changes to the building work that has been approved under a previous stage?

☐ No ☐ Yes – if yes, please list details of the changes *(and highlight these changes in the attached plans and specifications):*

☐ National Multiple Use Approval: *Write national multiple use approval number*
(If yes, provide copies of MultiProof certificate, plans and specifications)

go ahead...

Christchurch City Council

I wish to receive my building consent/PIM and approved documentation in the following format:

☒ Electronically via Online Services

☐ CD

☐ Hard copy *(additional costs apply)*

The CD or hard copy documents are to be collected from:

All consent related invoices to be billed and sent via ☒ email or ☐ post to: ☒ Owner ☐ Agent

I / we understand that the fees charged at lodgement **are a deposit only**, and that the Council will charge me / us for all costs actually and reasonably incurred in processing this application. These will be paid before the consent is issued and the building work started.

All of the included information on this form is, to the best of my knowledge, true and correct. I understand that all plans, documentation and reports submitted as part of an application are required to be kept available for public record, therefore the public (including business organisations and other units of the Council) may view this application, once submitted. All development contributions charges (where applicable) will be billed to the owner(s) as shown on page two.

I / we understand that no work is to commence until the building consent is uplifted.

Signature of owner/agent:* *(on behalf of and with the authority of the owner)*

Date:* 30/09/2020

Print name: Andrew Siegenthaler

If you are signing this application on behalf of a company/trust/other entity (the applicant), you are declaring that you are duly authorised to sign on behalf of the applicant to make such an application.

By signing this application you are accepting responsibility to pay all actual and reasonable costs incurred by the Christchurch City Council. Where an invoiced amount has not been paid by the stated due date, the Council may commence debt recovery action. The Council reserves the right to charge interest, payable from the date the debt became due, and recover costs incurred in pursuing recovery of the debt.

PRIVACY INFORMATION:
If you would like to request access to, or correction of, your details, please contact the Council.

5. The project

Description of the building work:*

3 bedroom domestic dwelling with attached double garage

Will the building work result in a change of use of the building?* ☐ Yes ☒ No

If yes, provide details of the new use:

Intended life of the building if less than 50 years: years

List building consents previously issued for this project below *(if any)*: ☒ None

Building/PIM*:	Resource:	Subdivision:	ECan:

Were there pre-application meetings prior to this application being made?

☒ No ☐ Yes - Pre-application reference number *(if applicable)*:

Estimated value of the building work on which the building levy will be calculated *(incl. GST)*:* $ 378000
(state estimated value as defined in section 7 of the Building Act 2004)

If this is an application to amend a building consent, advise the estimated value of amended building work *(incl. GST)*: $

- Is this in addition to, or reduction from, what was stated with the original application? ☐ Addition ☐ Reduction ☐ No change

6. Restricted building work

Will the building work include any restricted building work?* ☒ Yes ☐ No

If Yes, provide the following details of all licensed building practitioners who will be involved in carrying out or supervising the restricted building work. *(If these details are unknown at the time of the application, they must be supplied before the building work begins.)*

NOTE: If requested, only the building practitioners marked 'yes' below may download, once approved and paid, the building consent documentation through online services. To gain access the building practitioners will need to phone 03 941 8999 or email onlineservices@ccc.govt.nz.

Designer or Architect:			
Name of LBP:	Andrew Siegenthaler	Registration or LBP number:	BP108550
Licensing class:	Design 2	Certificate of design work attached?	☒ Yes
Access to download building consent approved?	☒ Yes		

Structural Engineer:			
Name of LBP:		Registration or LBP number:	
Licensing class:		Certificate of design work attached?	☐ Yes
Access to download building consent approved?	☐ Yes		

Builder:			
Name of LBP:		Registration or LBP number:	
Licensing class:		Record of building work attached?	☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐ Yes		

Other:			
Name of LBP:		Registration or LBP number:	
Licensing class:			☐ Yes
Access to download building consent approved?	☐Yes		

Note: Continue on another page if necessary.

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Christchurch City Council

7. Project information memorandum (this section is not applicable if this is an application for a building consent only)

The following matters are involved in the project:

☐ Subdivision
☐ Alterations to land contours
☒ New or altered connections to public utilities
☒ New or altered locations and/or external dimensions of buildings
☒ New or altered access for vehicles
☐ Building work over or adjacent to any road or public place
☒ Disposal of stormwater and wastewater
☐ Building work over any existing drains or sewers or in close proximity to wells or water mains
☐ Other matters known to the applicant that may require authorisations from the territorial authority: *(specify)*

8. Building consent (this section is not applicable if this is an application for a project information memorandum only)

The following plans and specifications are attached to this application:*

Lyn Bunn Drawings
Lyn Bunn Docs
Lyn Bunn LBP Cert

The building work will comply with the building code as follows:*

Clause *(select relevant clause numbers of building code)*	**Means of compliance** *(refer to the relevant acceptable solution or verification method or detail of alternative solution in the plans and specifications)*	**Waiver/modification required** *(state nature of waiver or modification of building code required)*
☒ B1 - Structure	AS1 & VM1	
☒ B2 - Durability	AS1	
☒ C1-6 - Protection from Fire	AS1	
☒ D1 - Access Routes	AS1	
☐ D2 - Mechanical Installations for Access		
☒ E1 - Surface Water	AS1	
☒ E2 - External Moisture	AS1	
☒ E3 - Internal Moisture	AS1	
☐ F1 - Hazardous Agents on Site		
☒ F2 - Hazardous Building Materials	AS1	
☐ F3 - Hazardous Substances and Processes		
☒ F4 - Safety from Falling	AS1	
☒ F5 - Construction & Demolition Hazards	AS1	
☐ F6 - Visibility in Escape Routes		
☒ F7 - Warning Systems	AS1	
☐ F8 - Signs		
☐ F9 - Restricting access to residential pools		
☒ G1 - Personal Hygiene	AS1	
☒ G2 - Laundering	AS1	
☒ G3 - Food Prep./Prevention of Contamination	AS1	
☒ G4 - Ventilation	AS1	
☒ G5 - Interior Environment	AS1	
☐ G6 - Airborne and Impact Sound		
☒ G7 - Natural Light	AS1	
☒ G8 - Artificial Light	AS1	
☒ G9 - Electricity	AS1	
☐ G10 - Piped Services		
☐ G11 - Gas as an Energy Source		
☒ G12 - Water Supplies	AS1	
☒ G13 - Foul Water	AS1 & AS2	
☐ G14 - Industrial Liquid Waste		
☐ G15 - Solid Waste		
☒ H1 - Energy Efficiency	AS1	

9. Compliance schedule (this section is not applicable if this is an application for a project information memorandum only)

☐ **The specified systems for the building are as follows:** *(specified systems are defined in the regulations)*

☐ **The following specified systems are being altered, added to, or removed in the course of the building work:**

		Existing	New	Altered	Added	Removed
1.	Automatic systems for fire suppression (eg sprinkler systems)	☐	☐	☐	☐	☐
2.	Automatic or manual emergency warning systems for fire or other dangers	☐	☐	☐	☐	☐
3.	Electromagnetic or automatic doors or windows	☐	☐	☐	☐	☐
4.	Emergency lighting systems	☐	☐	☐	☐	☐
5.	Escape route pressurisation systems	☐	☐	☐	☐	☐
6.	Riser mains for use by fire services	☐	☐	☐	☐	☐
7.	Automatic backflow preventers connected to a potable water supply	☐	☐	☐	☐	☐
8.	Lifts, escalators, travelators or other systems for moving people or goods within buildings	☐	☐	☐	☐	☐
9.	Mechanical ventilation or air conditioning systems	☐	☐	☐	☐	☐
10.	Building maintenance units (for providing access to the exterior and interior walls of a building)	☐	☐	☐	☐	☐
11.	Laboratory fume cupboards	☐	☐	☐	☐	☐
12.	Audio loops or other assistive listening system	☐	☐	☐	☐	☐
13.	Smoke control systems	☐	☐	☐	☐	☐
14.	Emergency power systems for, or signs relating to, a specified system in 1 to 13 above.	☐	☐	☐	☐	☐
15.	Other fire safety systems or features	☐	☐	☐	☐	☐
16.	Cable cars	☐	☐	☐	☐	☐

☒ **There are no specified systems in the building.**

10. Attachments

The following documents are attached to this application:

☒ Plans and specifications* (list under section 8)
☒ Memoranda from licensed building practitioner(s) who carried out or supervised any design work that is restricted building work
☐ Project information memorandum
☐ Development contribution notice
☐ Certificate attached to project information memorandum (Form 4)
☒ Completed relevant application checksheet(s)

Please continue on the APPENDIX overleaf for further information requested by the Christchurch City Council.

Appendix

A. Additional Information

(i) Certificate for public use (section 363 Building Act) *(Commercial application only)*

Do you intend to keep the building open to the public and/or intend to open part of your building prior to the code compliance certificate being issued? *E.g. alteration to a medical centre, construction of a mixed use office/retail building*

☐ No Note: If this intention does change during your construction, a Certificate for Public Use can be applied for.

☐ Yes:
1. Details of how those parts of the building being used remain in compliance with the Building Code during construction is required.
2. Supporting documentation must be attached.

For further information in regards to Certificate for Public Use and applying for one, please refer to our website ccc.govt.nz/certificate-for-public-use/

(ii) Earthquake related work

Is this application earthquake related?

☐ No

☐ Yes

If yes, is it coordinated by an insurance company via a project management organisation (PMO), e.g. Arrow, Fletchers, etc?

☐ No

☐ Yes - name of PMO:

Does the work involve earthquake structural strengthening work?

(Applicable only for residential buildings with 2 or more stories and containing 3 or more household units; and commercial applications)

☐ No

☐ Yes

If yes, is the building currently at or above the minimum level of 34% NBS?

(if below 34% New Building Standard (NBS) defines as earthquake-prone building)

☐ No

☐ Yes

(iii) Re-cladding/Weathertight Homes Resolution Services scheme related work

Does the work involve re-cladding the building?

☐ No

☐ Yes

Is this application related to a claim under the WHRS scheme?

☐ No

☐ Yes - WHRS claim number:

Is this application related to a claim under the Financial Assistance Package scheme?

☐ No

☐ Yes

B. Development Contributions

Information required for assessment of levies under the CCC 2015 Development Contributions Policy.

(i) Residential development

The use of land or buildings for living accommodation purposes including residential units, serviced apartments and unit/strata development but excluding traveller's accommodation such as hotels, motels, hostels.

Existing:	
Number of residential units:	

New total *(Existing plus proposed)*:	
Number of residential units:	

Has a residential unit been demolished/removed from the site? ☐ Yes ☐ No Date:

The following section applies when there will be more than one residential unit on the site:

Gross floor area: m^2 Gross floor area of each unit: m^2

The following section applies where there will be two or more attached residential units on the site:

Impervious surface area*: m^2 Impervious surface area*: m^2

(ii) Non-residential development *(Commercial application only)*

The use of land or buildings for commercial premises/offices, shopping centres, supermarkets, service stations, market, bulk goods / home improvement stores, retail facilities, manufacturing industries, restaurants, warehouse/storage, commercial accommodation.

Existing:			
Impervious surface area:*	m^2		
Landscaping area:	m^2		
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Total gross floor area:	m^2		

New total *(Existing plus proposed)*:			
Impervious surface area:*	m^2		
Landscaping area:	m^2		
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Gross floor area:	m^2	Land use:	
Total gross floor area:	m^2		

(iii) Special assessment

If the development is one that is not recognised as a residential or non-residential land use (as above) or has a significantly greater impact than that envisaged for the land use in the Christchurch City Plan then please provide the following information for a special assessment of development levies.

Existing:	
Impervious surface area:*	m^2
Traffic movements per day:	
Litres of water usage per day:	

New total *(Existing plus proposed)*:	
Impervious surface area:*	m^2
Traffic movements per day:	
Litres of water usage per day:	

** Impervious Surface Area shall include the area of roofs, paving and gravel.*

C. Effects on existing council infrastructures and street scenes

A separate application is required for requests to alter Council's existing infrastructural assets; removal, trimming or planting of street trees, or alteration to any built structures or vegetation plots. Approval is required to use part of legal road for construction activities.

Council is responsible for managing all works on roads. Roads include unformed roads, service lanes, pedestrian walkways and alleyways. Temporary Traffic Management must be provided for all work occurred on legal roads. For further information refer to www.ccc.govt.nz or call (03) 941 8999 and discuss with an Asset Protection Officer.

It is highly unlikely that private requests will be identified in the Council's Long Term Council Community Plan; for this reason the applicant will have to fund the cost of the work. The costs may include consultations with stakeholders, together with Board or Council's decision making process if required. Other Council charges may apply, e.g. vehicle crossing inspection.

(a) **Does this property require a new water connection?**	☐ No - please provide existing water meter serial number: ☒ Yes - ☐ New Commercial *(please make a separate application on form WS1 for all commercial water connections and email to water.connections@ccc.govt.nz Application to be made at time connection is required but no later than 3 months before.)* ☒ New Residential *(please complete the sections below)*
Do you require more than one new water connection for this property? If so, how many?	*(Council policy states that only one connection per parcel of land is permitted. If you require multiple connections please supply subdivision plan and RMA number.)*
Location details:	☒ Left Hand Boundary ☐ Right Hand Boundary ☐ Corner sites: Street on which the water connection is to be installed: *(Preferred location of water connection (looking from the street). If no selection is made then Council will install your new water location in an appropriate location. Council may not always be able to place your new water connection in your chosen location.)*
Please provide contact details in case we need to contact you about your water connection:	Phone: 0274 901 323 Email: lyn390@gmail.com

(b) **Are new or pumped connections required for:** *(New connections are where there no existing lateral provided to the property boundary from the council systems.)*	**Stormwater:** ☐ No ☒ Yes - ☒ Stormwater to kerb ☐ Stormwater to mains **Sewer:** ☐ No ☒ Yes - ☒ Foul water to mains ☐ Pumped
Do you have consent/authorisation to discharge?	☒ No ☐ Yes - please provide a copy

(c) **Is a new vehicle crossing required or an existing crossing altered for this project?** **If yes**, please complete the Vehicle Crossing Application Form.	☐ No	☒ Yes
(d) **Are any of the following items affected by the development?**	☒ No	☐ Yes
• Street furniture (bus shelter, bicycle stand, bollards, regulatory and advisory traffic sign support barriers, safety fence, retaining surface, water and waste plants, utility boxes, power poles, and/or existing objects). For electrical, gas and Telco alterations contact utility owner.	☒ No	☐ Yes
• Street trees – Trimming, removal, new planting or excavation within drip line	☒ No	☐ Yes
• Landscaped areas or berms	☒ No	☐ Yes
If yes, has Council staff been consulted, their advice given and a report prepared by them for the community board?	☒ No	☐ Yes
• Utility surface boxes – Water and waste, Telco	☒ No	☐ Yes
(e) **Is the existing pavement type (concrete, asphaltic concrete or interlocking blocks) being changed?**	☒ No	☐ Yes
(f) **Are you proposing to change the existing footpath levels?**	☒ No	☐ Yes
(g) **Are you proposing to change the existing carriageway/road levels?**	☒ No	☐ Yes
(h) **Are there existing traffic measures that would be affected/changed by the development?** *(e.g. Parking restrictions, regulatory signs, road narrowing, road, hump, platform, parking spaces, pedestrian refuge, traffic signals, texturised pavement, bus stop, speed limits, school crossing.)*	☒ No	☐ Yes

Other information and requirements are available from our website (www.ccc.govt.nz):
Public Places Bylaw 2008, Traffic and Parking Bylaw 2008, Policies on Streets Roads and Pavements, Temporary Use of Legal Road for Construction Activities Application, Water Discharge on Road Application. www.mfe.govt.nz/laws/standards/contaminants-in-soil

go ahead...

Christchurch City Council

APPLICATION CHECKSHEET

Single Residential Dwelling and Accessory Building

Use for single stand-alone dwellings, dwelling additions and/or alterations, repiles, garages, decks, gazebos, sheds, retaining walls, etc.

Note 1: *Schedule 1 of Building Act 2004, allows for some building work to be exempt from building consent provided certain conditions are met. Even if a consent is not required, all building work must comply with the Building Code.*

Address:	Lot 460 Prestons Park

This checksheet shows you the minimum information that has to be supplied for a Single Residential Dwelling and Accessory Building with your building consent application. Please complete each box in the Customer use column as you attach the information. Complete all sections using either a ✓ or **Y** where the information is provided, or a **X** or **N/A** where the information is not applicable to the building work proposed as shown on the key at the bottom of each page.

Customer use		
	1.	**GENERAL** ***COMPLETE FOR ALL APPLICATIONS***
Y	**a.**	**Building Consent Application Form (B-002):** Completed and signed by the owner or by an agent on behalf of the owner. ▪ Where an application is for a staged building consent, complete fields in Section 4 of the application form along with details of the approval from a council officer. Note: Staged building consent applications to construct or alter a building are required to be approved by Council prior to the first application being lodged. See our Pre-application meeting webpage for more information.
Y	**b.**	**Proof of Ownership:** A recent copy of each current certificate(s) of title (less than six months old) and where applicable a copy of purchase agreement (if recently purchased), a copy of relevant portions of current lease or document showing the full name of legal owner(s) of the building. ▪ CT available at Christchurch City Council for a fee. Required ☐ yes / ☒ no *(applicant to complete)*
Y	**c.**	**Plans and Details Required** ▪ Locality plan showing physical location of the site in relation to streets or landmarks, north point and lot and DP number. ▪ All details on following pages.
Y	**d.**	**Relationship to owner:** You as agent must state the details of the authorisation from the owner to make application on the owner's behalf (e.g. contractual agreement etc). **Please note:** This question **must be** answered before your application for consent can be processed.
	e.	**Application Fee:** Applications will not be processed without payment of the appropriate application fees. Fees payable are set out in the Building Consents Fee Schedule available on our website and will be invoiced on acceptance of the application

Key: ✓ or Y = provided X or N/A = not applicable to job

Y	**f.**	**Certificate of Design Work:** Where the proposed building work includes restricted building work the application for building consent must include a Certificate of Design Work from a licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work. Or, where a owner-builder exemption applies, provide a Statutory Declaration as to Owner-Builder Status form.

Customer use		**2. SITE/LOCATION** ***COMPLETE FOR ALL PROJECTS***
Y	**a.**	**Site Plan (1:200) showing:** ▪ Boundary dimensions, north point, legal description, site area. ▪ Known easements, right of ways, waterways, heritage/archaeological information. ▪ Physical location of all existing and proposed buildings in relation to streets and boundaries with building setbacks dimensioned and building areas noted. ▪ Street trees, poles, sumps, communication boxes, traffic islands. ▪ Hill/sloping sites – ground contours, drive gradients, extend of cut and fill, retaining walls. ▪ Vehicle access, crossing location, hard standing, manoeuvre and parking areas. ▪ City Plan requirements – living/service courts, landscape areas (L3, L4 zones), recession plane locations, site coverage %. ▪ Rural sites: Total impervious surface areas including all buildings and hard standing areas.
Y	**b.**	**Levels showing:** ***(NOTE: WHERE INUNDATION OF THE PROPERTY COULD BE AN ISSUE, THE LEVELS AND THE ASSOCIATED BENCHMARK MUST BE IN TERMS OF THE CHRISTCHURCH CITY DATUM OR FOR THE BANKS PENINSULA AREA MEAN SEA LEVEL IN TERMS OF THE LYTTELTON 1937 DATUM.)*** ▪ Existing and proposed site levels and proposed finished floor levels (especially at critical points where required to show City/District Plan compliance). ▪ On hill sites provide a registered surveyor's certificate confirming the existing site levels.

Y	**c.**	**Sediment Control:**
		A sediment control management plan shall be provided where building work may result in disturbance of the ground, including:
		▪ Sediment run-off from the disturbed ground, soil or demolition rubble stockpiles.
		▪ Transfer of sediment/materials off the site by vehicles.
		▪ The following must be clearly indicated on the site plan;
		  ▪ Building footprint
		  ▪ Direction on falls to ground level (site contours or directional arrows)
		  ▪ Drainage control
		  ▪ Sediment fences
		  ▪ Stabilised entry/exit rock pad
		  ▪ Flow control bunds
		  ▪ Soil or demolition rubble stockpiles
		
		Further guidance information in regard to sediment control management can be obtained for Environment Canterbury (ECan) website esccanterbury.co.nz/sediment-control/

Y	**d.**	**Protection of the Public/Site Management:** ▪ Provide details of barriers for the protection of public and for restricting public access to site, details of hoardings and gantries.

Customer use		**3. DEMOLITION / REMOVAL**
N/A	**a.**	Site plan clearly showing extent of demolition work and identifying termination of services and date of demolition.

Customer use		**4. SERVICES** ***COMPLETE FOR ALL PROJECTS WITH NEW INSTALLATION OR ALTERATION OF PIPED / DUCTED SERVICES, HEATING AND ELECTRICAL OR MECHANICAL SERVICES.***
Y	**a.**	**Plumbing and Drainage Plans (1:100 / 1:200) showing:** ▪ Drainage layout with inspection bends and junctions indicated for both sewer and stormwater. ▪ Nominate the design that the plumbing/drainage system is to be installed to.

Key: ✓ or Y = provided X or N/A = not applicable to job

- Invert levels of any existing drains (if extending).
- Any other drainage on site including council mains and retaining wall field drains, stormwater protection (i.e. sumps, washpads, containment, etc).
- Fixtures and fittings.
- Hotwater system(s) – gas/electric, pressure type, valving, location of HWC, anti-scald device, seismic restraints, etc.
- If the building is more than one storey with sanitary fittings on upper floors, provide an isometric layout showing wastes, pipes and falls (or indicate clearly on the floor framing plan).
- Downpipe sizes and locations.
- Consent from neighbour to construct private drains(Form B-042)
- Septic tank and effluent disposal system if no connection the Council services - Onsite effluent disposal design to be provided by a suitably qualified consultant and include confirmation the discharge is a permitted activity. Refer to link for checklist to be provided: canterburymaps.govt.nz/webapps/StoryMapSeries/on_site_domestic_waste_water.html
- Method of stormwater disposal if no connection the council services (ECan approval is required in Banks Peninsula area – please provide a copy of this approval) . Also supply with your application a completed B-091 Stormwater Disposal Test form.

Customer use

4. SERVICES (continued)

N/A

b. Use of existing Laterals:

With much ground settlement having taken place in Christchurch area, accurate levels and gradients of existing in ground pipework is vital. This will usually require site investigation to "pot-hole" the existing lateral.

- Where it is proposed to use existing laterals verification will required stating existing laterals are still in sound condition and confirming the invert level and grade.

N/A

c. Water Supply:

- Details of source of supply for potable water
- Location bore and details of water tanks
- Copy of the Certificate of Analysis if connection is not to a town supply

Y

d. Gas Supply/Appliances:

- Reticulated or bottled?
- Gas bottle locations and capacities
- Location of gas appliances

N/A

e. Liquid fuel storage:

- Type of fuel (e.g. diesel, home blend, kerosene).
- Size and location of the fuel storage tank related to the building and site boundaries.
- Details of bund to the tank, e.g. Is the tank self bunded? *Note: The City Plan rules require that the volume of any containment or bund shall be 100% of the maximum volume of the hazardous substances to be stored, used, loaded or unloaded when the site is roofed; or 120% when unroofed.*
- Wall openings (windows or doors) and wall cladding material within one metre of the storage tank vicinity should be shown (including neighbouring properties).

N/A

f. Solid/Liquid/Gas Heating:

- For all fuel types of heating appliance provide - make, model, type, details and the manufacturers specification and installation instruction for both the heating appliance and the flue system
- For liquid fuel heating appliance also provide the Work Safe New Zealand approval number
- For solid fuel heating appliance also provide the Environment Canterbury Clean Air Certification number and if the property is within 'clean air zones' confirm the age of the existing operational solid fuel heating appliance being replaced or a resource consent number from Environment Canterbury

Y

g. Electrical/Mechanical Plans (1:100 / 1:200) showing:

- Ventilation of sanitary and laundry rooms
- Smoke alarm positions
- Electrical fixtures and fittings
- Down light positions (for Clause H1 purposes)

Customer use	5. FOUNDATIONS/FLOOR ***COMPLETE FOR ALL NEW BUILDINGS, BUILDING EXTENSIONS, ADDITIONAL STOREY ADDED OR REPILING***
Y	**a. Geotechnical Investigation (Ground Conditions Report):** The level of geotechnical investigations required to be undertaken will vary according to type of building and where subject property is located. Residential properties within the city have been given one of three technical categories. The Ministry of Business, Innovation & Employment provides guidance information regarding residential technical categories on their website www.building.govt.nz/building-code-compliance/canterbury-rebuild/repairing-and-rebuilding-houses-affected-by-the-canterbury-earthquakes/. Properties in rural areas or beyond the extent of land damage mapping, and properties in the Port Hills and Banks Peninsula have not been given a technical category. **Generally geotechnical investigation shall be as follows:** • **Technical Category 1 (TC1) and Technical Category 2 (TC2):** **Habitable buildings:** Unless being carried out as a specific design by an appropriately qualified geotechnical engineer, shallow subsurface investigations to determine the suitability and bearing capacity of the soil shall be carried out by a soils technician or other suitability qualified person under the guidance of a CPEng qualified engineer following the procedure as generally outlined in NZS 3604:2011, with the following exceptions:
Customer use	**5. FOUNDATIONS/FLOOR (continued)**
	▪ While the prescribed depth of investigation of 2 metres is typically acceptable, it is recommended that 50mm diameter boreholes for the examination of soil materials extend further, to between 3m and 4m below ground level. Significant areas of Canterbury are underlain with organic peat deposits and it is important to check for the presence of these materials. ▪ "Soft or very soft peat" in the defined exclusions from 'good ground' is to be replaced with "peat' in the list of unacceptable materials. ▪ For foundation options 1-4 in Section 5 of the MBIE guidance document 'Repairing and rebuilding houses affected by the Canterbury earthquakes' to be used requires the geotechnical investigations to achieve Scala blows per 100mm of a minimum 2 blows (i.e. 50mm per blow) for ground deemed to have 200 kPa geotechnical ultimate bearing capacity. For other foundation types 300 kPa will need to be confirmed in accordance with NZS 3604:2011. **Uninhabited detached buildings that are not constructed as an integral part of a house (eg garage structures and outbuildings):** Shallow subsurface investigations to determine the suitability and bearing capacity of the soil shall be carried out by a soils technician or other suitability qualified person procedure as generally outlined in NZS 3604:2011. • **Technical Category 3 (TC3):** **Habitable buildings:** The scope of a deep geotechnical investigation must be determined by the geotechnical professional responsible for giving advice on the property in question. The geotechnical professional must be either a CPEng geotechnical engineer or a PEngGeol engineering geologist with suitable relevant training and experience in foundation investigations and liquefaction assessment. Refer to section 3.4.2 of the MBIE guidance document 'Repairing and rebuilding houses affected by the Canterbury earthquakes' for guidance on the type of geotechnical investigation required for these buildings. **Uninhabited detached buildings that are not constructed as an integral part of a house (eg garage structure and outbuildings):** Shallow subsurface investigations to determine the suitability and bearing capacity of the soil shall be carried out by a soils technician or other suitability qualified person procedure as generally outlined in NZS 3604:2011. (see section 11.3 of the MBIE guidance document 'Repairing and rebuilding houses affected by the Canterbury earthquakes' for guidance. • **Properties in rural areas or beyond the extent of land damage mapping, and properties in the Port Hills and Banks Peninsula:** **Habitable buildings:** Applications for building consent approval are subject to investigation by geotechnical engineers or engineering geologists to assess risk and provide development and

	mitigation advice as necessary. A report (and if necessary a foundation and drainage support design) will be required to support an application for building consent. **Uninhabited detached buildings that are not constructed as an integral part of a house (eg garage structures and outbuildings):** Shallow subsurface investigations to determine the suitability and bearing capacity of the soil shall be carried out by a soils technician or other suitability qualified person procedure as generally outlined in NZS 3604:2011.
Y	**b. Foundation Plan (1:100/1:50) showing:** ▪ Provide subfloor bracing plan and calculations for all piled structures. Where the structure is specifically engineered, this should be included with the producer statement ▪ Dimensions of all new foundations ▪ If a concrete slab, show basic details including reinforcing, slab thickenings, shrinkage control joints and free joints where necessary ▪ For timber floors show pile, bearer and joist layout ▪ If the addition is an upper storey show details on upgrading existing foundations, joints, piles, etc ▪ Indicate ventilation to sub floor spaces ▪ Subfloor bracing plan and calculations are required where an additional storey is to be added.
Customer use	**5. FOUNDATIONS/FLOOR (continued)**
Y	**c. Foundation details showing:** ▪ Details including reinforcing and connections ▪ DPM ▪ Slab insulation details ▪ Ground level clearances

Customer use	**6. CONSTRUCTION** ***COMPLETE FOR ALL NEW STRUCTURES OR ALTERATIONS TO EXISTING STRUCTURES***
N/A	**a. Existing Floor Plan (1:100/1:50) showing: (for additions and alterations only)** ▪ All levels ▪ All designated spaces ▪ All removals/demolitions ▪ Sanitary fixtures ▪ Heating appliances ▪ Smoke detectors
Y	**b. Proposed Floor Plans (1:100/1:50) showing:** ▪ Room dimensions ▪ Location of partitions ▪ All designated spaces ▪ All floors (new or altered) ▪ Location of sanitary fixtures ▪ Stairs, barriers, handrails and beams ▪ Floor joist layout for each level with timber floors ▪ Heating appliances ▪ Smoke detectors
N/A	**c. Proposed Floor Framing Plan (1:100) showing: (for upper floors only)** ▪ Direction, size and centres of joists ▪ Location of doubled joists, boundary joists, main blocking ▪ Location of walls or any specific design beams supporting floor joists. ▪ Sanitary plumbing pipe layouts, including pipe diameters and gradients and details of any pipe penetrations through joists
Y	**d. Bracing Plans (1:100/1:50) showing:** ▪ Location, type and number of bracing elements to indicate compliance with clause B1 of the Building Code for walls, roofs, chimneys, sub-floors, and for decks projecting more than 2m from the house.

Y	**e. Bracing Details:** ▪ Provide bracing calculations, including sub-floor. (Also required for existing lower storeys where an additional storey is being added.) ▪ If the bracing is specifically designed by a structural engineer, provide the engineer's calculations and PS1 (required for specific design wind zones and where bracing is outside of the scope of NZS 3604).
Y	**f. Sections (1:50/ 1:20/ 1:25) showing:** ▪ Sufficient in number to show all changes in building form/shape ▪ Basic construction of all floors, walls and roof ▪ Stairs (internal and external), and decks/terraces and barriers providing safety from falling ▪ Framing sizes, beams, lintels, trusses and other structural items. (Lintels carrying point loads require specific engineering design) ▪ Timber species, grade, and treatment ▪ Roof cladding, eaves, fascia, gutters ▪ Stud heights of rooms and total building height ▪ Insulation indicated, showing conditioned and unconditional spaces (garage, etc)

Customer use	**6. CONSTRUCTION (continued)**
Y	**g. Construction Details (1:10/ 1:5):** ▪ Floor/wall/roof junctions including flashings and fixing details ▪ Details of fixings of timber framing to steel work ▪ Window/door installation (including roof lights) and flashings and sill supports systems ▪ Cladding penetrations ▪ Deck, balcony, balustrades and barrier construction. ▪ Fire rated construction details (for all walls within 1.0m of a boundary and walls between attached units) including eaves and veneer cavities ▪ Fire rated construction where eaves (including spouting or guttering) are within 650mm of the boundary ▪ Stair construction and handrails ▪ Internal gutters and rain water outlets ▪ Retaining walls, and associated subsoil drainage system
Y	**h. Truss Design:** ▪ Design certificate and truss layout plan from the truss manufacturer ▪ Fixing and bracing details and load path to ground ▪ Specific design for lintels where required - include design calculations. ▪ Specific design slab thickenings where required
Y	**i. Energy Efficiency (Insulation):** ▪ Method of compliance detailed (Schedule, Calculation, Modelling, ALF) • Schedule method: Summary required • Calculation or Modelling Method: Provide all calculations • ALF: Provide print-out ▪ All insulation specified, including glazing ▪ Position and type of downlights
N/A	**j. Alternative Solutions:** If the proposal building uses products, systems or methods that are not covered in the Cited Standards or Acceptable Solutions of the Building Code, provide supporting current information including appraisal certificates, independent test results (full signed reports), case studies, expert opinion (including evidence of experience/qualification, basis for forming opinion, and statement of independence), etc, to demonstrate compliance.

Customer use	**7. STRUCTURAL** ***COMPLETE FOR ALL PROJECTS INCORPORATING SPECIFIC STRUCTURAL DESIGN***
Y	**a. Structural Drawings:** If any design work requires the services of a structural engineer, include a copy of the structural documents, if not shown on the architectural drawings. These must be consistent with the architectural drawings.

Y	**b.**	**Producer Statements:** If this application for consent relies on any producer statements certifying compliance with the NZ Building Code. These must include: ▪ An accurate reference to all work covered. ▪ The qualifications of the person issuing the statement to verify that they have the necessary expertise to issue the statement. ▪ Details of the inspections that will be carried out by third parties.
Y	**c.**	**Structural Calculations:** Structural calculations are to be supplied with the Producer Statements. A design features report should be supplied to assist processing of the application.

Customer use		
	8.	**EXTERNAL** ***COMPLETE FOR NEW BUILDINGS OR EXISTING BUILDINGS WITH ALTERATIONS TO THE EXTERNAL SHELL***
Y	**a.**	**Elevations (1:100/1:50) showing:** ▪ Existing and proposed ground lines ▪ District Plan recession planes and maximum height ▪ Location and size of door and window openings including fixed and opening sashes ▪ Safety glazing ▪ Finished floor levels ▪ All exterior cladding(s), construction joints, cladding junctions, shelf angle sizes and locations. ▪ Location and size of sill supports ▪ RWH, down pipes and spouting ▪ Ventilators to sub-floor area (suspended floors only)
Y	**b.**	**Roof plan (1:100/1:50) for multiple level or multiple cladding type roofs showing:** ▪ Roof layout ▪ Material used and pitches ▪ Penetration locations ▪ Internal gutter locations, direction and degree of fall ▪ Gutter outfall and overflow locations
Y	**c.**	**Risk Assessment (for other than single storey construction with 450mm min eaves)** *(Risk matrix in E2/AS1 may be used)* Consider exposure, design and detailing to support appropriate selection of cladding.
N/A	**d.**	**E2 Alternative Solutions:** If the proposal uses products or systems that are not covered in the Acceptable Solutions of clause E2 of the Building Code provide supporting current information including independent test results (full signed reports), case studies, expert opinion (including evidence of experience/qualification, basis for forming opinion, and statement of independence), etc, to demonstrate compliance.

Customer use		
	9.	**CHANGE OF USE** ***COMPLETE FOR ALL EXISTING BUILDINGS WHERE THE PROPOSAL INVOLVES FORMING A HOUSEHOLD UNIT WHERE ONE DID NOT EXIST BEFORE***
N/A	**a.**	**Assessment of the building for compliance with the Building Code:** Section 115(a) of the Building Act 2004 requires that the work comply fully with all clauses of the Building Code.
N/A	**b.**	**Reasonably Practicable:** The above assessment must relate to all Building Code Clauses. If the proposal is for the project to meet anything less than full compliance with any clauses, your application must clearly state your reasoning, with supporting documentation, and show how you will meet the highest level of compliance that can be considered reasonably practicable.

Customer use	10. SPECIFICATIONS ***COMPLETE FOR ALL APPLICATIONS. Note: The specification must be specific to the project and cover all aspects of the proposed work, including reference to applicable standards.***
Y	**a. Specification: General** ▪ Elements of structure (size, spacing, timber treatment, grade, species) ▪ Finish of fixings to meet durability requirements of clause B2 ▪ Plumbing and drainage materials and design that installation is to comply with ▪ Wet area surfaces and finishes ▪ Ventilation systems ▪ Slip resistance for external access routes and all stairs ▪ Glazing detailing compliance with clauses B1, F2 and H1 ▪ Type of smoke alarms (including existing smoke alarms where they will remain, and that they will all have a "hush" facility). ▪ Products and materials all new? If not state in the specifications how the requirements of B1, B2, E2 and H1 are to be satisfied?

Customer use	10. SPECIFICATIONS (continued)
Y	**b. External Claddings:** For each of the following claddings provide details of the product name, manufacturer, maintenance requirements and warranties offered: ▪ Building and sill wraps ▪ Wall claddings ▪ Roof claddings ▪ Membranes (roofs and decks) ▪ Tanking ▪ Joinery, including details of sill supports for both window and doors.

Customer use	11. HAZARDOUS AGENTS OR CONTAMINANTS ON SITE ***COMPLETE FOR ALL PROJECTS INVOLVING THE DISTURBANCE OF SOIL OR CHANGE OF USE TO THE BUILDING***
N/A	**a. Contaminated or potentially contaminated Land:** **Compliance with the requirements of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health.**

Is an activity described on the Hazardous Substances and Industries List (HAIL) currently being or has been undertaken (or has more likely than not been undertaken) on the piece of land to which this application relates?	Yes ☐	No ☐
If the answer to the above question is YES, then the NES <u>may</u> apply. Please identify whether the application involves any of the activities below:		
Does the proposed activity involve disturbance of soil?	Yes ☐	No ☐
Does the application involve removing or replacing a fuel storage system or parts of it?	Yes ☐	No ☐
Does your application involve changing the use of the building to one which, because the land has been subject to a HAIL activity, is reasonably likely to harm human health? (e.g. service station to office, orchard to residential)	Yes ☐	No ☐
If the answer to any of the above activities is YES, then the NES is <u>likely</u> to apply. **You will need to establish whether your proposal complies with the NES.** Therefore a Detailed Site Investigation report may be required from a suitably qualified and experienced contaminated land specialist in accordance with the NES and its referenced MfE Guidelines		

The NES for Assessing and Managing Contaminants in Soil to Protect Human Health and the Hazardous Activities and Industries List (HAIL) are available on the Ministry for the Environment website: www.mfe.govt.nz/land/nes-assessing-and-managing-contaminants-soil-protect-human-health/about-nes

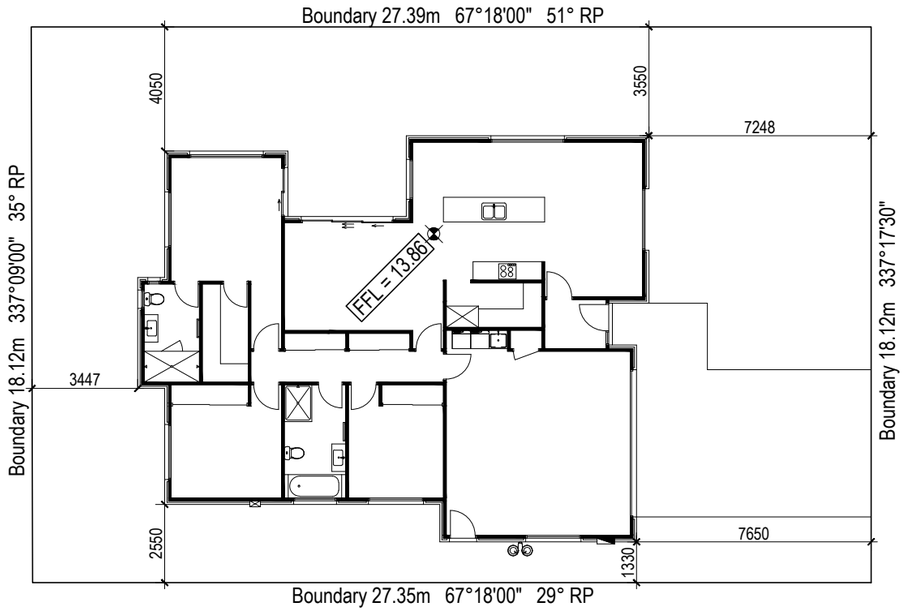
Customer use	12. SPECIFIED SYSTEMS / COMPLIANCE SCHEDULE **(NEW AND EXISTING BUILDINGS)** ***ALL BUILDINGS WHERE* IS THERE A CABLE CAR ASSOCIATED WITH THE BUILDING WORK**
N/A	**a. Cable Car:** For each Cable Car to be installed, altered, or removed in the course of the building work the proposed inspection, routine maintenance and reporting procedures for each system are to be detailed Section 9 of application form.

Customer use	13. OTHER CHECKSHEETS & INFORMATION THAT MAY BE REQUIRED ***NOTE: PLEASE ENSURE THAT ALL THE APPROPRIATE CHECKSHEETS ARE FILLED IN.*** ***INFORMATION LISTED BELOW IS AVAILABLE FROM OUR WEBSITE AT CCC.GOVT.NZ/GOAHEAD***
N/A	**a.** Form B-054 – Swimming & Spa Pools and Associated Fences
N/A	**b.** Form B-055 – Solar Water Heater Application Checksheet
N/A	**c.** Form B-042 – Consent from neighbour to construct private drains
N/A	**d.** Form B-091 – Stormwater Disposal Tests
N/A	**e.** Form WS1 – Application for Water Supply Service
N/A	**f.** Public Places Bylaw 2008
N/A	**g.** Traffic and Parking Bylaw 2008
N/A	**h.** Policies on Streets Roads and Pavements
N/A	**i.** Temporary Use of Legal Road for Construction Activities Application
N/A	**j.** Water Discharge on Road Application
N/A	**k.** Vehicle Crossing Application

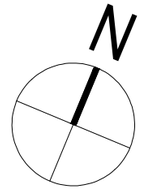
NOTES:
The issue of a building consent does not relieve the owner of any duty or responsibility under any other act. Please check with your local territorial authority regarding the requirement for other approvals required and fees payable. These may include:

- Consents under the Resource Management Act
- Approvals under bylaws including earthworks, vehicle crossings and road openings

Key: ✓ or Y = provided X or N/A = not applicable to job



HOFFMAN STREET



Lot 460
DP 549008

Hoffman Street
Prestons Park
CHRISTCHURCH

Site Coverage:

184.7m² / 495.0m² = 37.3%

NZBC F5: All Construction work on the building shall be performed in a manner that avoids the likelihood of:
(a) Objects falling onto people on or off the site,
(b) Objects falling on property off the site,
(c) Other hazards arising on the site affecting people off the site and other property, and
(d) Unauthorised entry of children to hazards on the site

ALLOW FOR STEPS OR LANDSCAPING TO ALL EXTERNAL DOORS SO STEP FROM FFL NO GREATER THAN 190mm (100mm min)

Anti-slip: on all access routes both internal & external, provide Anti-slip surface complying with NZBC D1/AS Table 2 (except surfaces in side Entry Doors of housing maybe considered dry areas)

SITE SAFETY
Allow for and maintain
- 2m high galv chainlink netting fencing to street front
- where side fencing not in place use same 2m high fencing
- where water hazards are present use same 2m high fencing

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0272 838 775

job title:
BUNN HOUSE

drawing title:
SITE PLAN

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK

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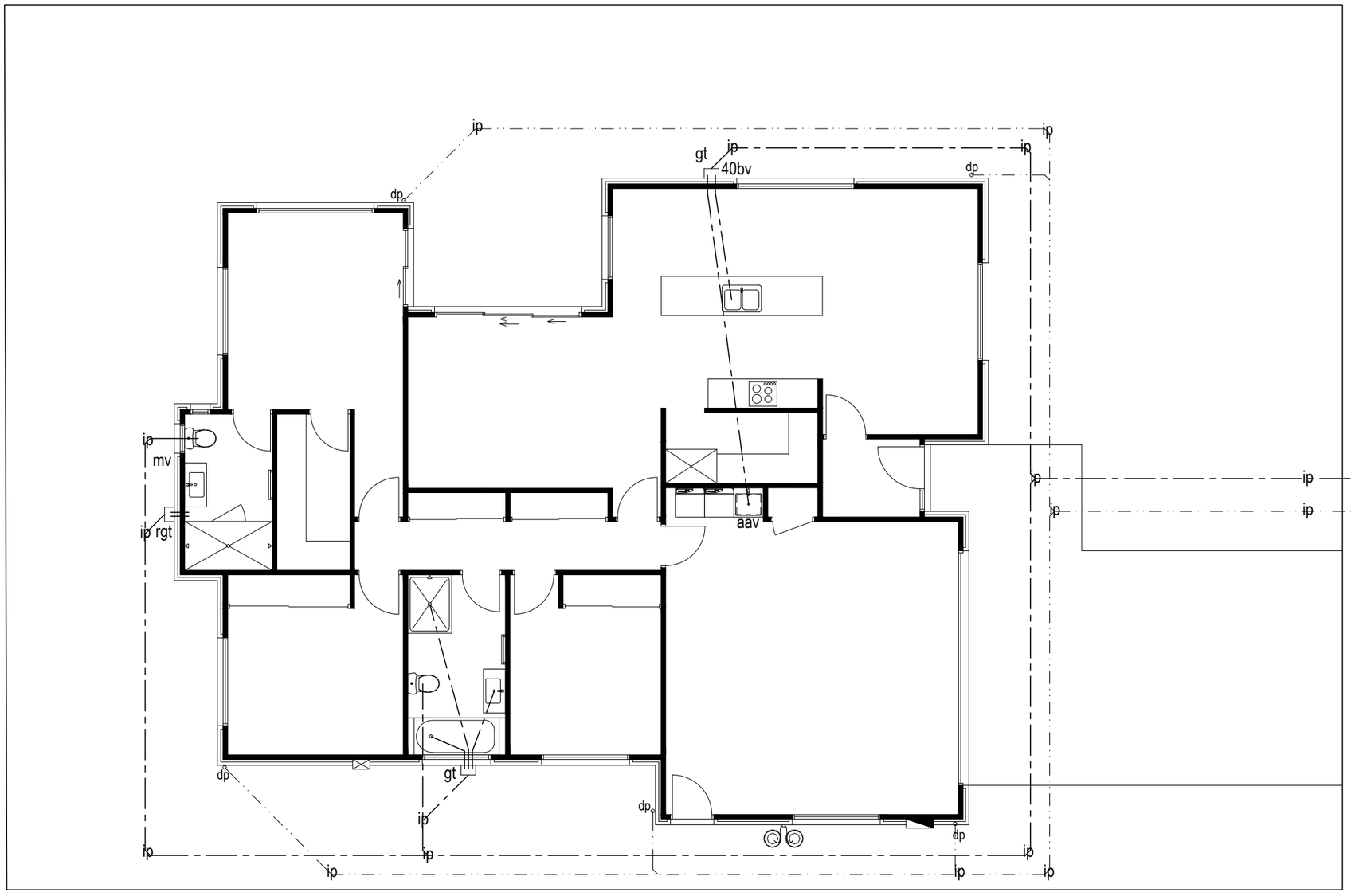

SANITARY FIXTURE	FLOW RATE/TEMP	PIPE DIAMETER
Bath	0.3 at 45°C	15mm
Sink	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Laundry Tub	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Basin	0.1 at 45°C	10mm
Shower	0.1 at 42°C	20mm

PIPE DIAMETER	MAXIMUM DISTANCE BETWEEN SUPPORTS (mm)	
	VERTICAL PIPE	GRADED PIPE
32 to 50	1000	500
65 to 100	1200	1000
Greater than 100	1800	1200

All drains laid at 1:120 to be laid with a verifiable leveling device

Relief GT - top of GT to be 150mm below overflow level of lowest sanitary fixture. FGL around Relief GT to be no higher than 13.61 (13.68 if paved)	13.86 = FFL - 0.15 = Shower Recess to Top GT - 0.10 = Top GT to FGL 13.61 = FGL

All pipes in Concrete to have Denso Tape (synthetic fabric based tape impregnated and coated with organic petroleum based compounds) applied

Pipes shall incorporate expansion joints in accordance with Chapter 8 of NZS7643

Hot water pipes to be sized according to NZBC G12 & NZS 4305. Mains Pressure: 15mm dia allows 12m max pipe length. Pipe length beyond this must be lagged

SANITARY FIXTURE	MIN PIPE DIA	MIN GRADE
Basin	32mm	1:20
Bath	40mm	1:40
Washing Machine	40mm	1:40
Kitchen Sink / Dish Washer	50mm	1:40
Laundry Sink	40mm	1:30
Shower	40mm	1:40
WC	100mm	1:60
SEWER PIPE	100mm	1:60
STORMWATER PIPE	100mm	1:120

Main Vent (MV) to terminate either:
- 3.0m above ground level
- 600mm above windows / openings
- 150mm above roof
- 600mm above eaves / parapets

HWC Relief Drain = 20mm Copper Pipe

VENT PIPES:
Discharge Pipes upto 40mm dia = 32mm Vent Pipe
Discharge Pipes over 40mm dia = 40mm Vent Pipe
Main Drain Vent Pipe = 80mm Vent Pipe

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job title:
BUNN HOUSE

drawing title:
SERVICES PLAN

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
SUBJECT TO COUNCIL APPROVAL
ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK
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scale: 1:100
Job No.: -

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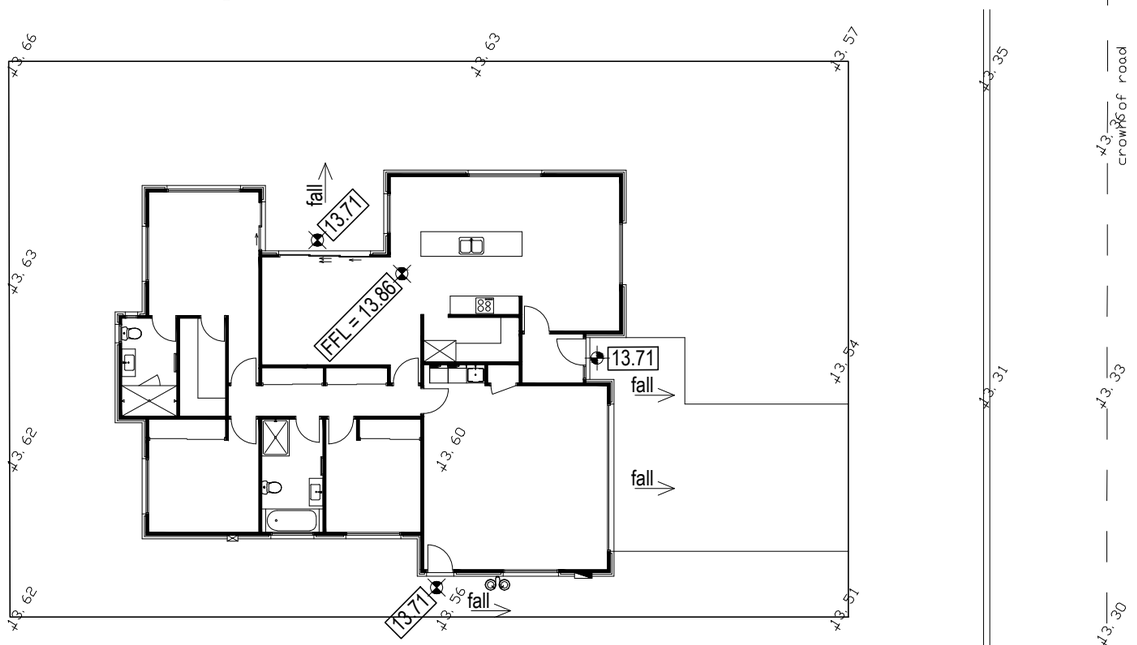
SURVEY ORIGIN DATA
- The property data has been sourced from Aurecon (May 2019) and is subject to final legal review by Land Information NZ (LINZ)
- Vertical elevations are in the terms of Christchurch Drainage Datum, SCIRT published June 2011
- The origin of Levels is BM 3257 (EHDK). RL 15.160m



CLEARANCES:
FFL to Ground = 200mm min (Brick)
FFL to Ground = 225mm min (WB)

Fall Ground away from building at 1:30 for atleast 1m

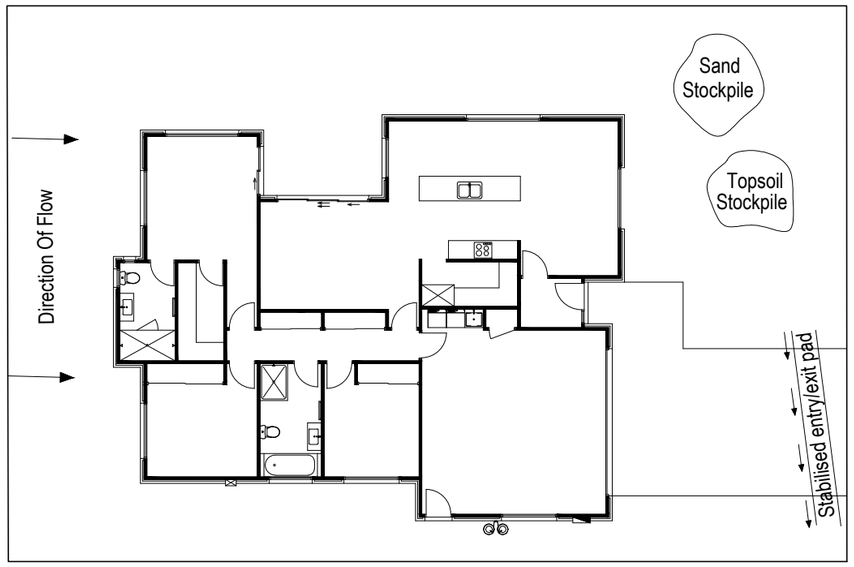
FFL to Paving = 150mm min
Fall Paving away from building

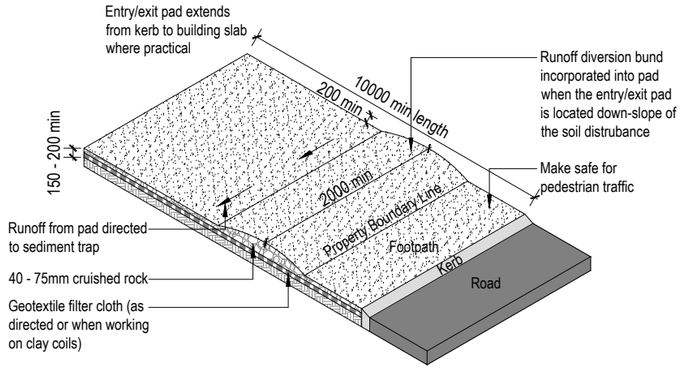
FALL DRIVE & PATHS
AT 1:100 Min

10.62 = Proposed levels
+10.59 = Existing levels

Fall Drive towards Gardens & Grassed areas as much as possible for water run off

a.s.c.a.d. limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: SITE LEVELS PLAN	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:200 Job No.: -	page: 03 of: 22 DATE: 30/09/2020





STABILISED ENTRY/EXIT PAD

Remove Stablisied Entry/Exit Pad apon completion of the formed driveway

Notes:

1. All erosion and sediment control structures to be inspected each working day and maintained in good working order

2. All ground cover vegetation outside the immediate building area to be preserved during the building phase

3. All erosion and sediment control measures to be installed prior to commencement of major earthworks

4. Stockpiles of clay materials to be covered with impervious sheet

5. Roof water downpipes to be connected to the permanent underground stormwater system as soon as practical after roof is laid

Grassed Kerb to street - where possible make sure grass remains intact or replace as soon as possible

Temperary Sediment Control Fence to Street Boundary

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job title:

BUNN HOUSE

drawing title:

SEDIMENT CONTROL PLAN

legal description:

Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

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Type 1 Smoke alarm to comply with NZBC clause F7, with Hush & Test facilities

All Lintels SG8 unless otherwise stated

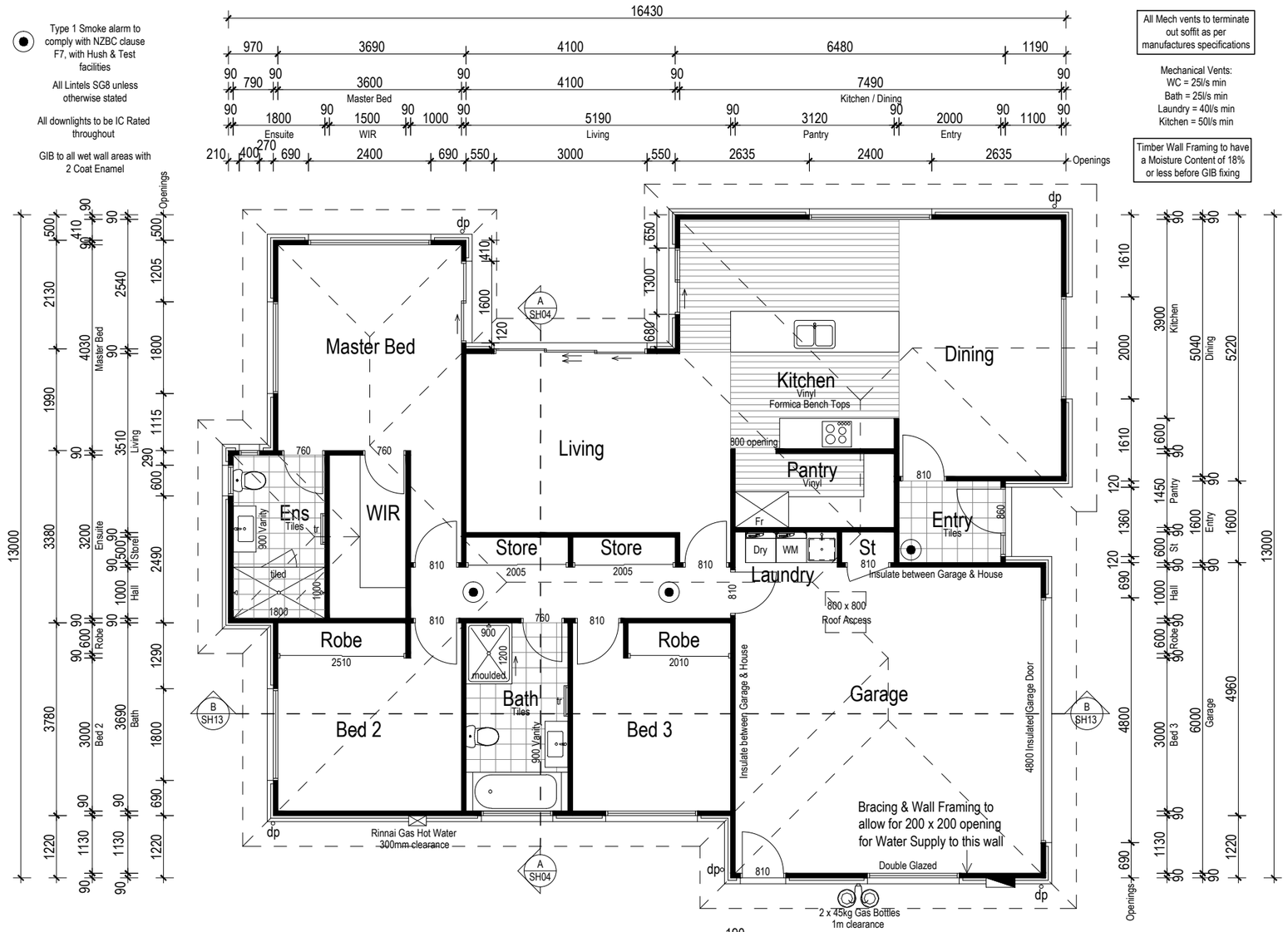
All downlights to be IC Rated throughout

GIB to all wet wall areas with 2 Coat Enamel

All Mech vents to terminate out soffit as per manufactures specifications

Mechanical Vents:
WC = 25l/s min
Bath = 25l/s min
Laundry = 40l/s min
Kitchen = 50l/s min

Timber Wall Framing to have a Moisture Content of 18% or less before GIB fixing



SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
INTERNAL WALLS
Light & Heavy Roof
Wind Zone = All

Loaded Dimension of Wall	Stud Size for Max Height of:			
	3.0m @ 600crs	3.6m @ 600crs	4.2m @ 400crs	4.8m @ 400crs
2.0	90 x 45	90 x 70	90 x 90	140 x 45
4.0	90 x 45	90 x 70	90 x 90	140 x 45
6.0	90 x 45	90 x 70	90 x 90	140 x 45

Note: Dwangs @ 800crs max

184.7m² OVER FOUNDATION

SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
Light & Heavy Roof
Wind Zone = High

Loaded Dimension of Wall	Stud Size for Max Height of:					
	2.4m @ 600crs	2.7m @ 400crs	3.0m @ 300crs	3.6m @ 300crs	4.2m @ 300crs	4.8m @ 400crs
2.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
4.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
6.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90

Note: Dwangs @ 800crs max

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job title:
BUNN HOUSE

drawing title:
FLOOR PLAN

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK

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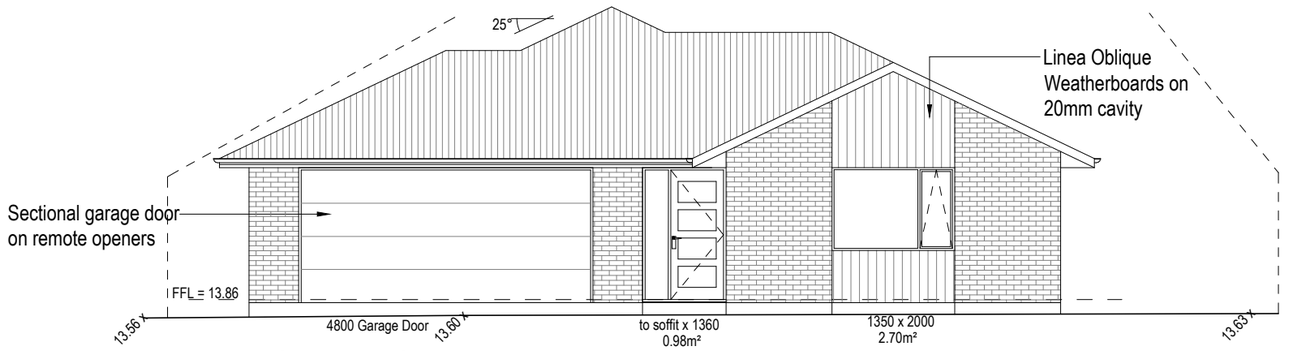
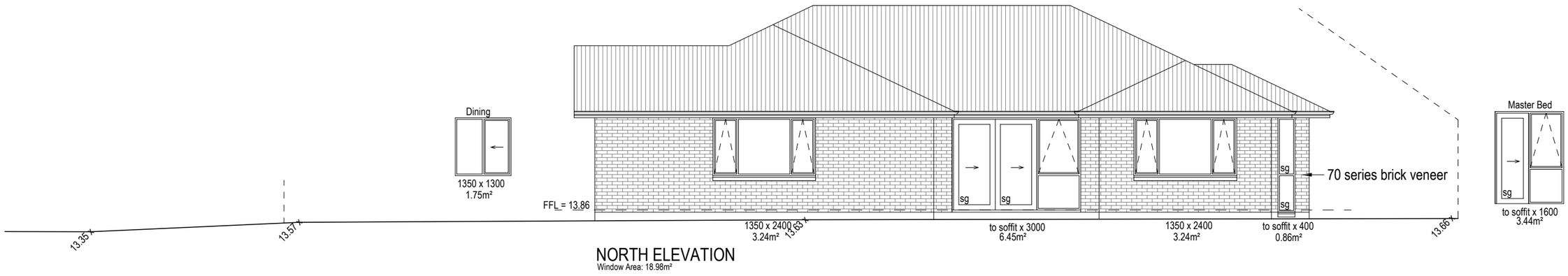


EAST ELEVATION

Window Area: 3.68m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



NORTH ELEVATION

Window Area: 18.98m²

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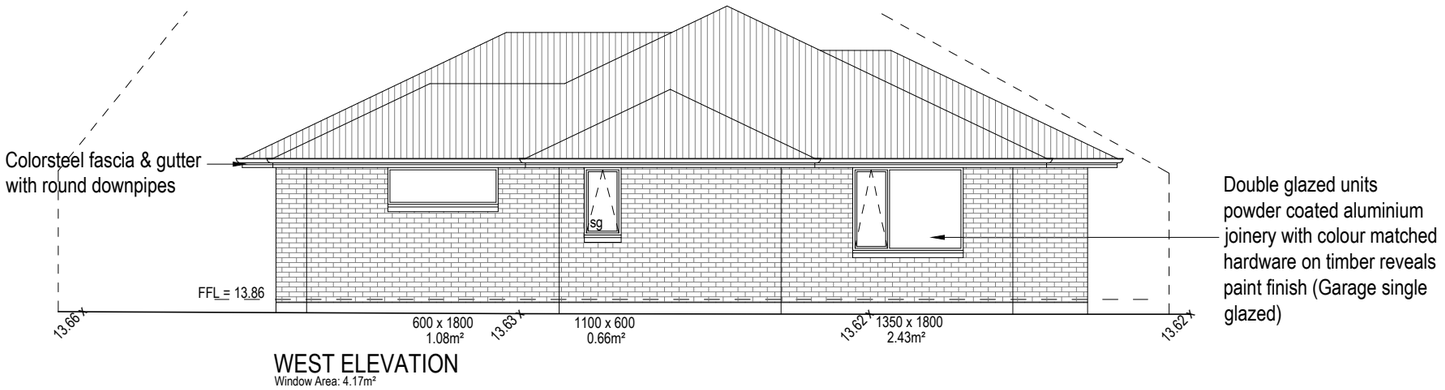
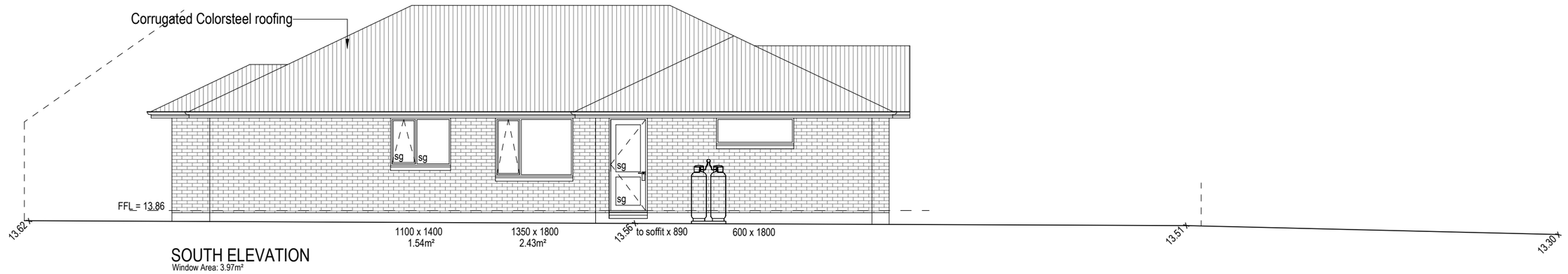


WEST ELEVATION

Window Area: 4.17m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



SOUTH ELEVATION

Window Area: 3.97m²

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job title:

BUNN HOUSE

drawing title:

ELEVATIONS

legal description:

Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

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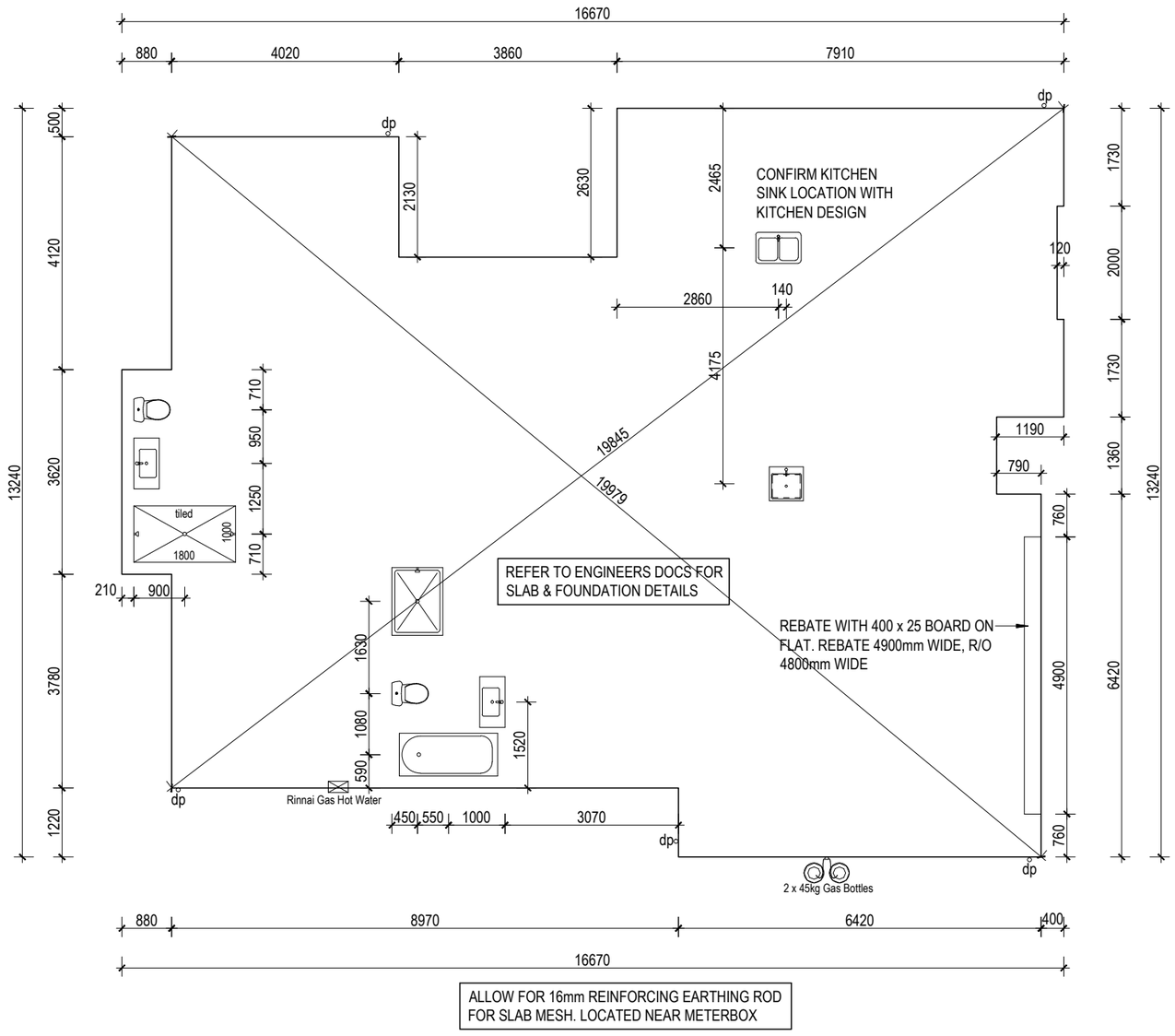

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BRACED WALLS - Extend top plate and or ceiling battens or bottom cord of truss to connect with external walls

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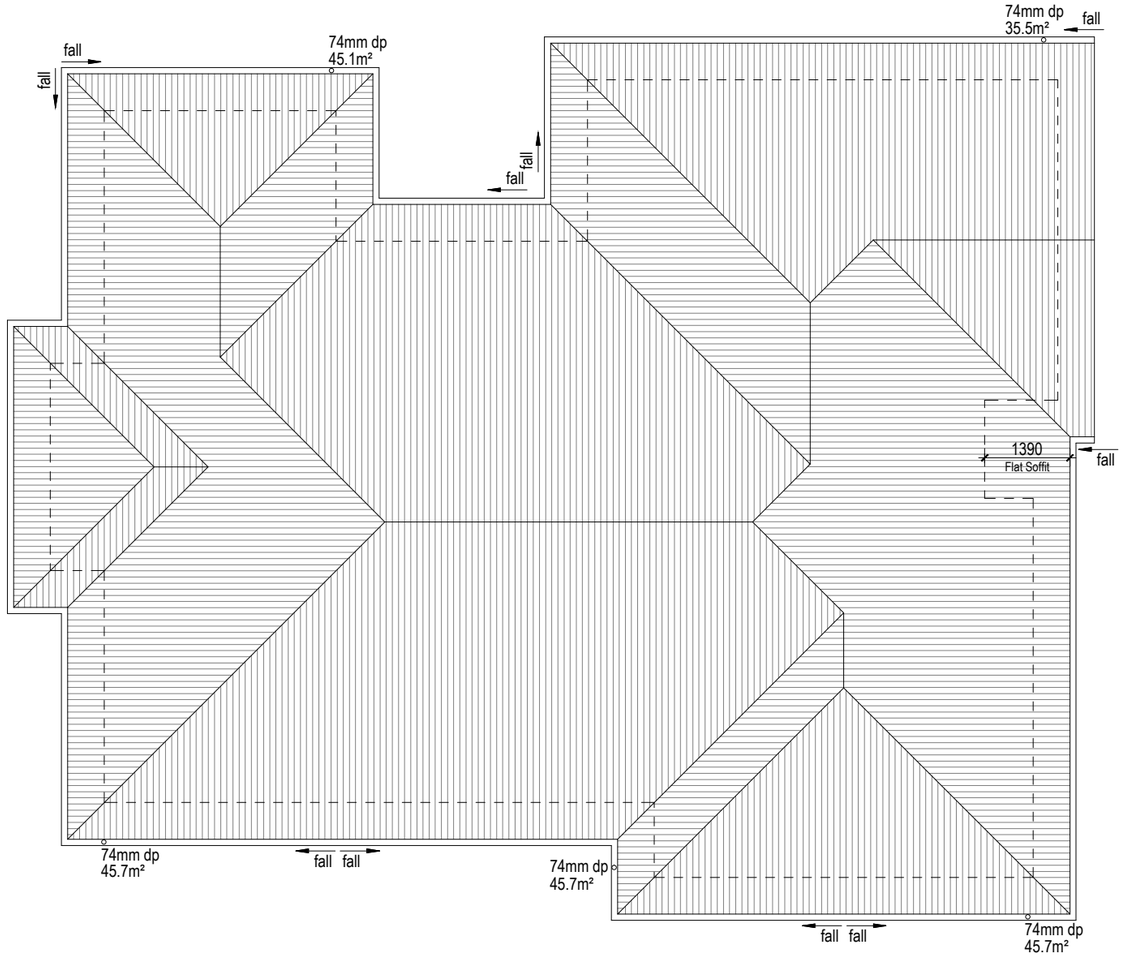

25° PITCH CORRUGATED COLORSTEEL ROOFING
600mm OVERHANG UNLESS OTHERWISE STATED

REFER TO TRUSS DESIGN DOCUMENTATION FOR ROOF PLANE BRACING DETAILS

USE DIAMOND QUAD WITH 6300mm² CROSS SECTIONAL AREA

USE 90 x 45 @ 900crs ON EDGE HORIZONTALLY SUPPORTING SOFFIT LININGS TO SOFFITS OVER 750mm WIDE

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job title:
BUNN HOUSE

drawing title:
ROOF PLAN

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

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Downlight

Batten Light

Smoke Alarm

Meter Board

Distribution Board

All downlights to be IC Rated throughout

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job title:

BUNN HOUSE

drawing title:

ELECTRICAL PLAN

legal description:

Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

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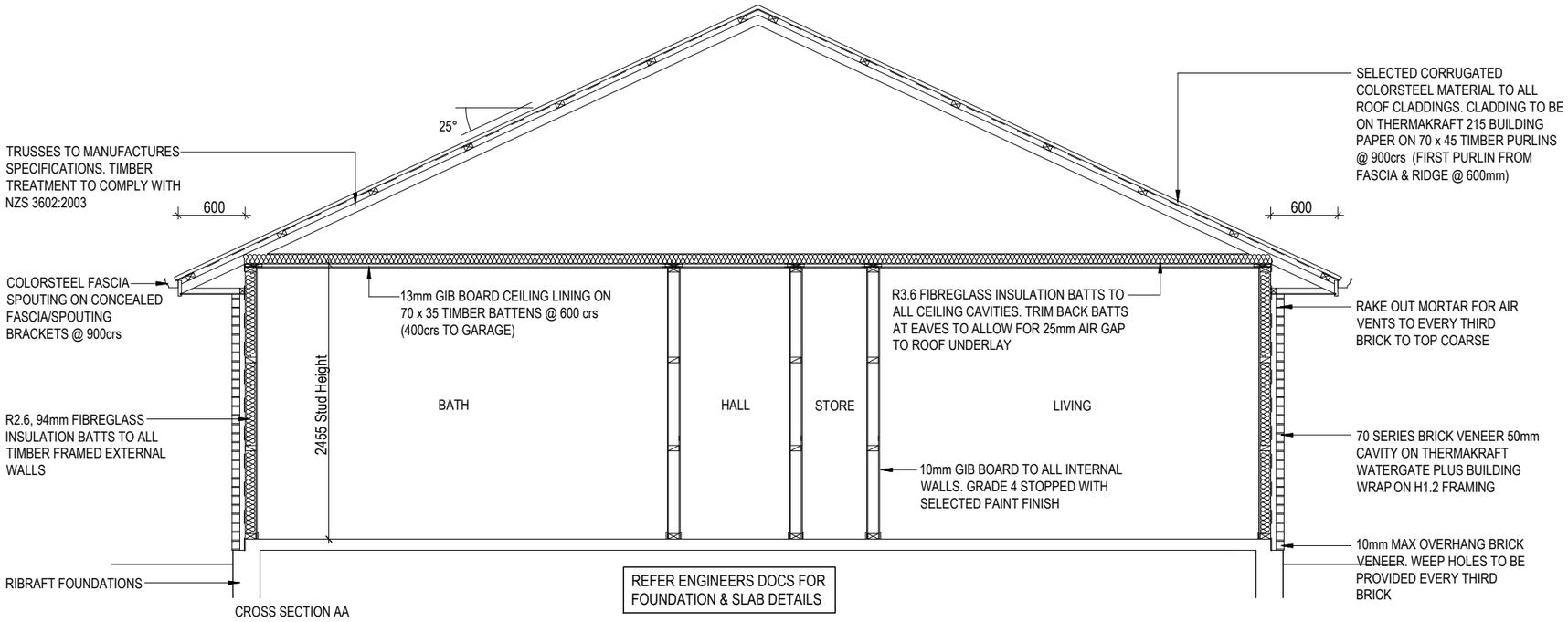

CROSS SECTION AA

SPECIFIC SCHEDULE OF TIMBER TREATMENT

ELEMENT	SPECIES	TREATMENT
ROOF FRAMING, TRUSSES	KILN DRIED & GAUGED RADIATA PINE	H1.2
INTERIOR WALL FRAMING	KILN DRIED & GAUGED PINUS SPECIES	H1.2
EXTERIOR WALL FRAMING (REFER TO NZS3602:2003 FOR CLARIFICATION)	RADIATA PINE	H1.2
WALL CAVITY BATTENS	RADIATA PINE	H3.1
ALUMINIUM WINDOW REVEALS	RADIATA PINE	H3.1

ELEMENT

- ALL TIMBER USED IS TO BE TREATED AS REQUIRED BY NZS3602:2003, THIS TABLE IS INTENDED AS A SUMMARY OF THESE REQUIREMENTS ONLY.

- TREATMENT LEVELS SHOWN ARE THE MINIMUM LEVEL REQUIRED. HIGHER TREATMENT LEVELS MAY BE USED IF APPROPRIATE.

TIMBER TYPE:
EXTERIOR & LOAD
BEARING FRAMING = SG 8
INTERIOR NON LOAD
BEARING FRAMING = SG 8
LINTELS = SG 8
TRUSSES = SG 8

TRIMMED INSULATION AREA (90mm rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33	2.1

STEEL PROTECTION FOR FIXINGS & FASTENINGS - ZONE B & C

FIXING FASTENING	ENVIRONMENT	MATERIAL
Nail Plates	Closed & Roof Space	Continuously coated galv steel
Wire Dogs & Bolts	Closed & Roof Space	Hot-dipped galv steel
All strutural fixings	Sheltered	Hot-dipped galv steel
	Exposed	Type 304 stainless steel
Nail/Screw for bracing		Galv steel
Nail/Screw for non-structural cladding		Galv steel
Nail/Screw for framing	Closed & Roof Space	Mild steel
	Sheltered	Galv steel
	Exposed	Galv steel

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job title:
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drawing title:
SECTION AA

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WORKING DRAWINGS

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scale:
1:50
Job No.:
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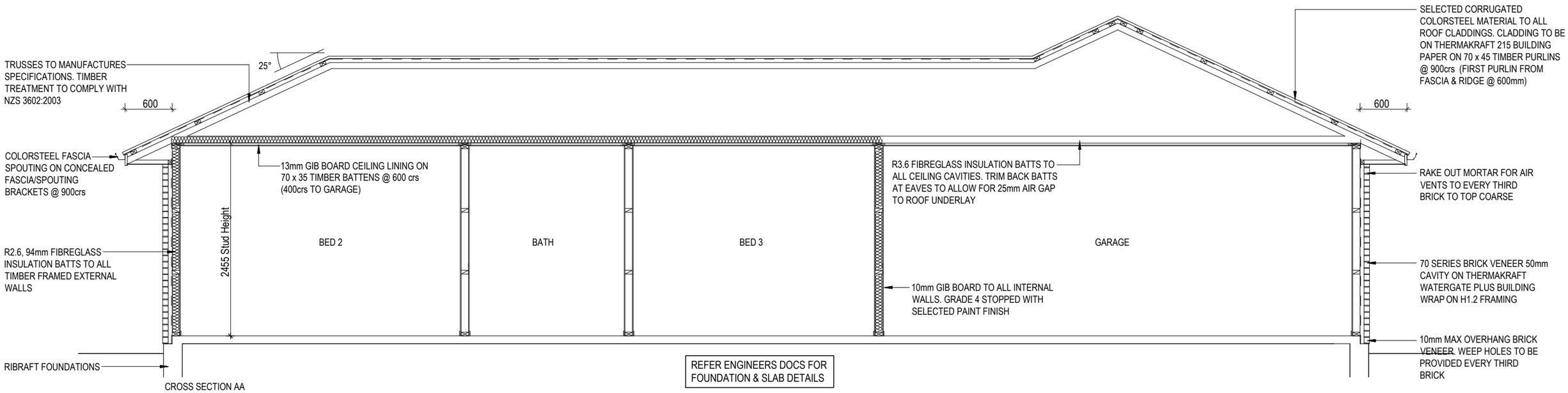
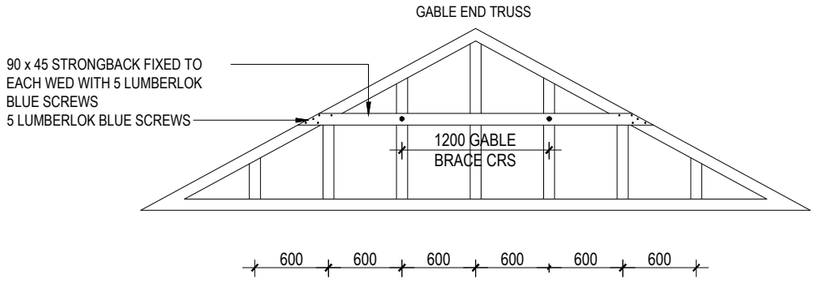
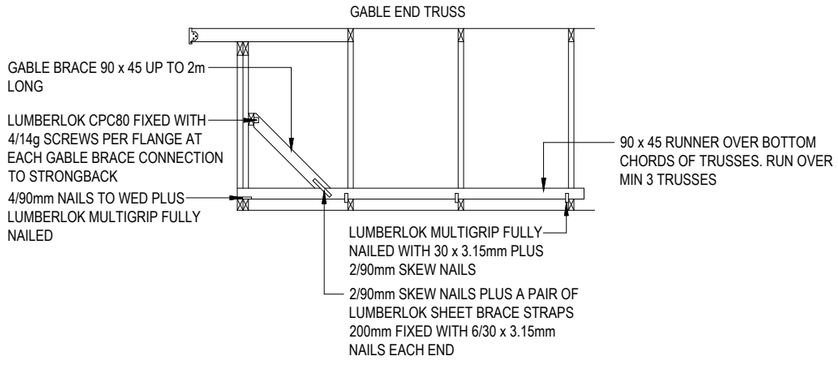


CROSS SECTION AA





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job title:

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drawing title:

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legal description:

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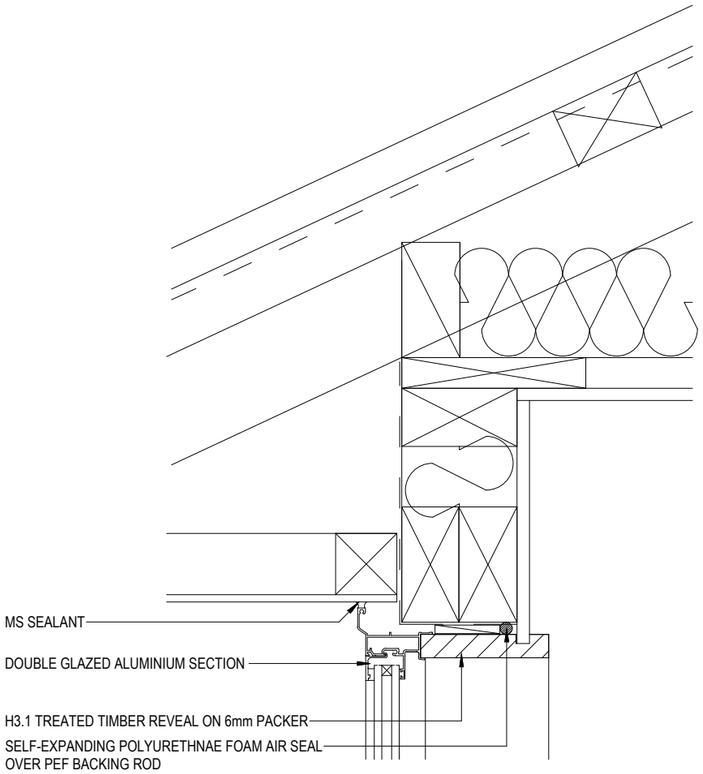
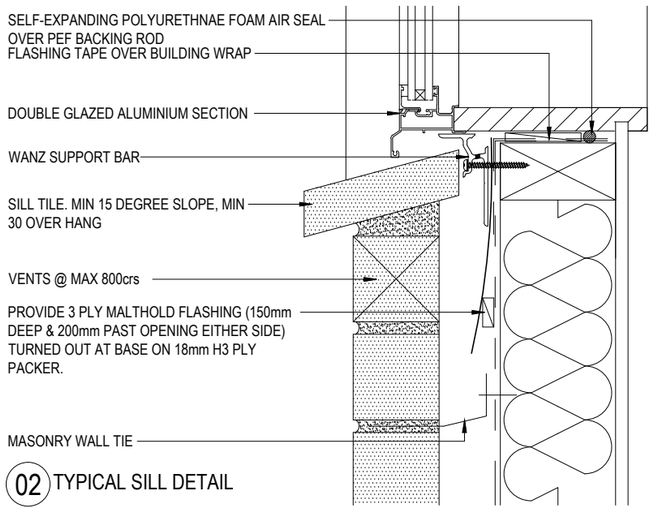
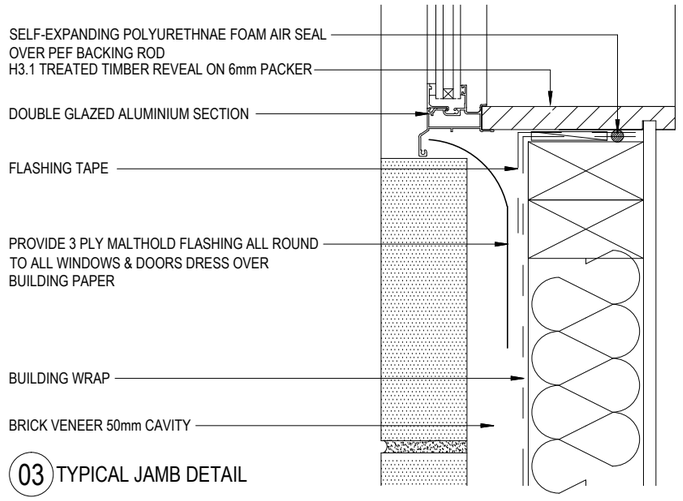


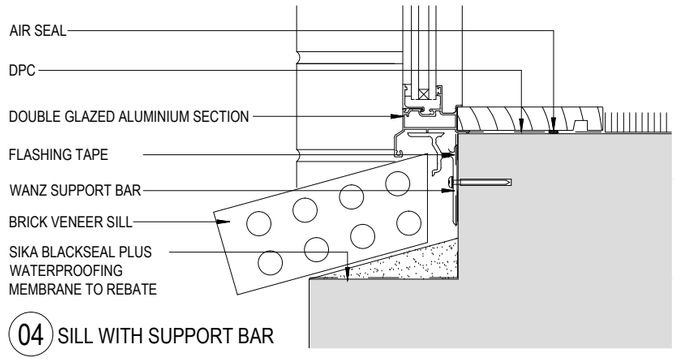
01 TYPICAL HEAD DETAIL



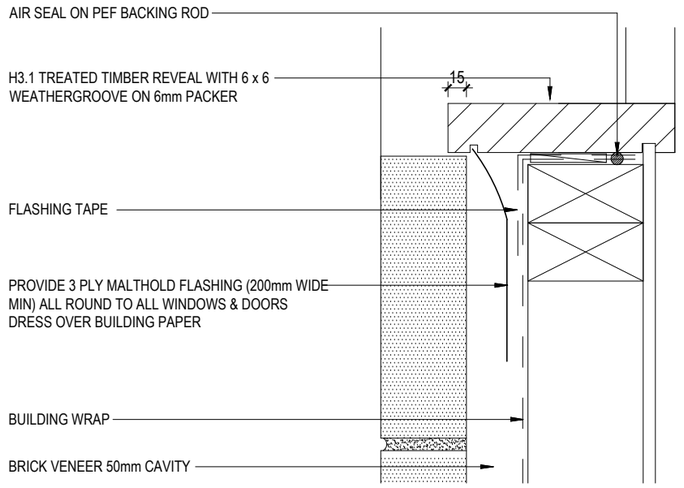
02 TYPICAL SILL DETAIL



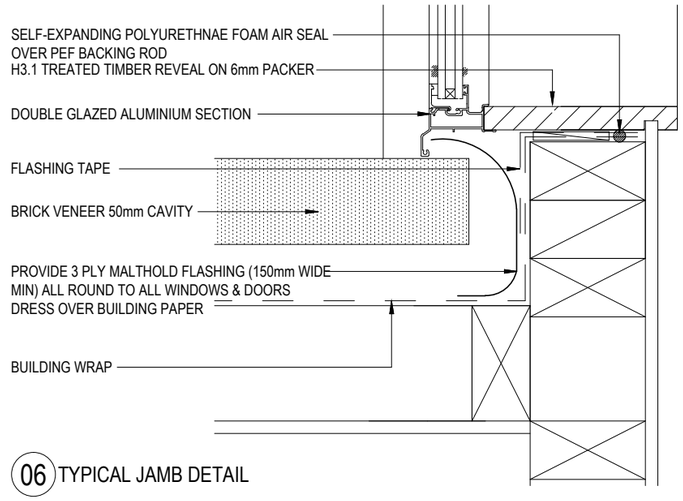
03 TYPICAL JAMB DETAIL



04 SILL WITH SUPPORT BAR



05 TYPICAL GARAGE DOOR JAMB



06 TYPICAL JAMB DETAIL

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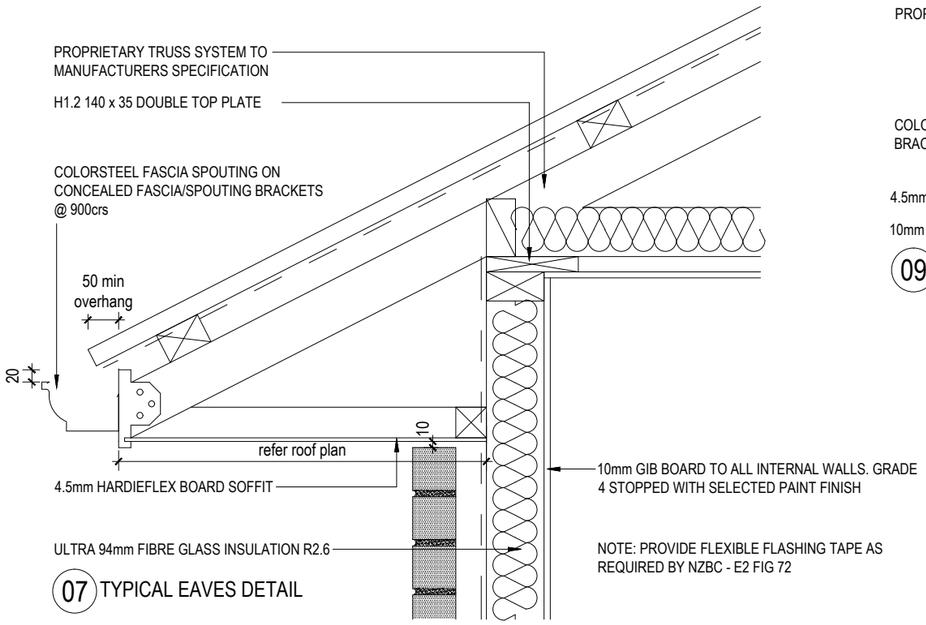
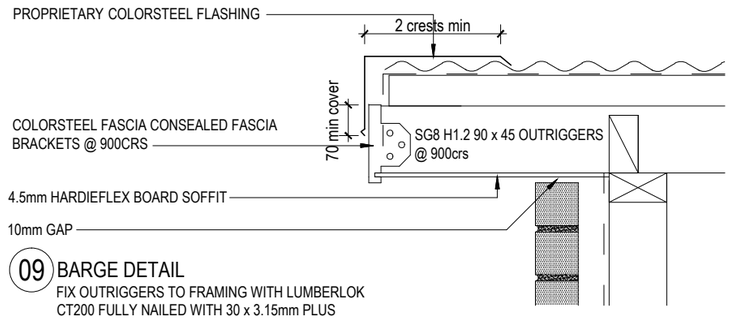
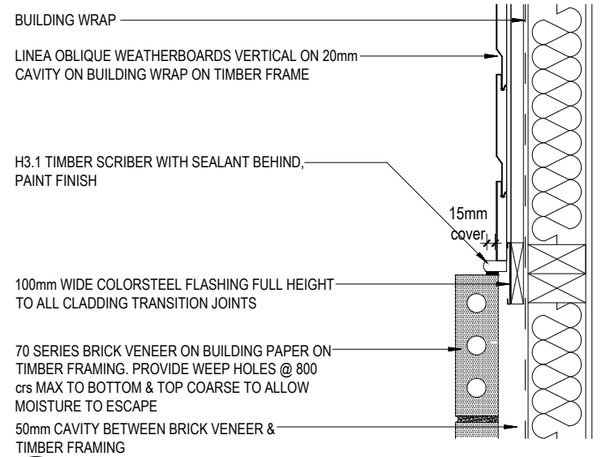


07 TYPICAL EAVES DETAIL

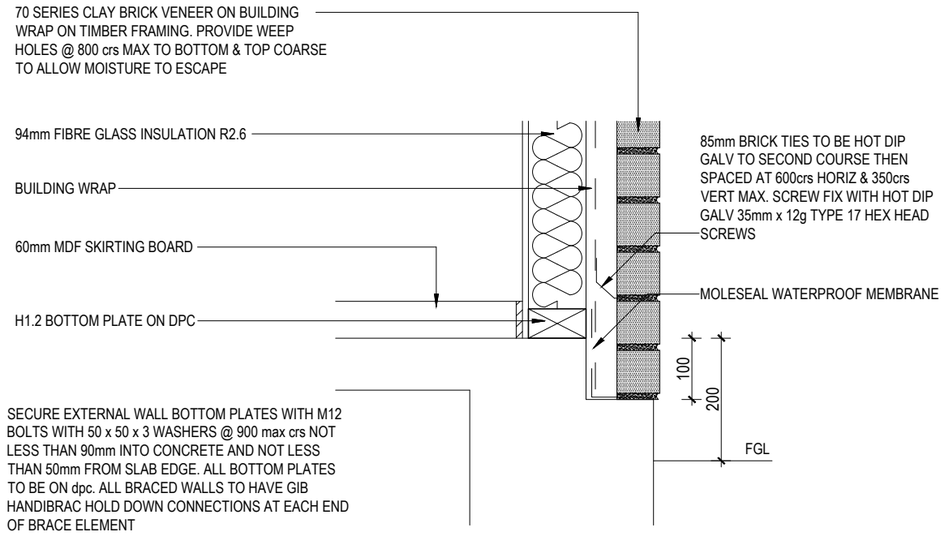


09 BARGE DETAIL

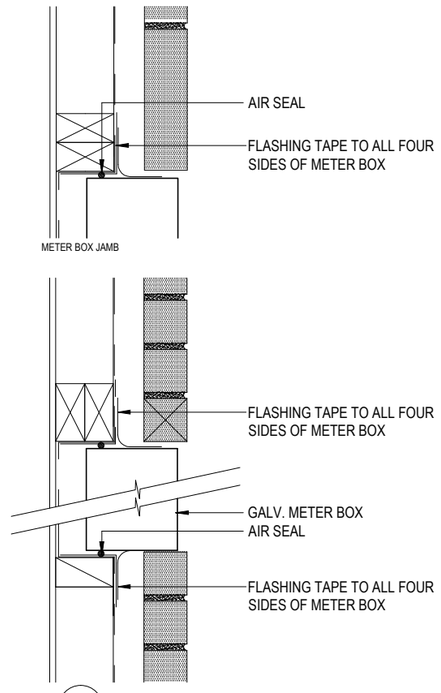
FIX OUTRIGGERS TO FRAMING WITH LUMBERLOK CT200 FULLY NAILED WITH 30 x 3.15mm PLUS 2/90mm SKEW DRIVEN NAILS



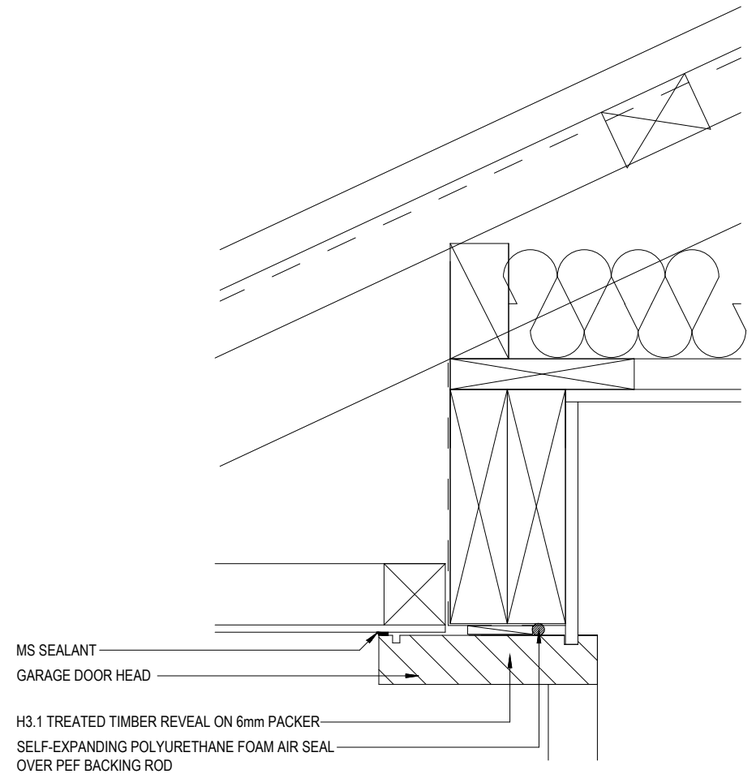
11 WB TO BRICK VENEER CLADDING TRANSITION DETAIL



08 FOUNDATION DETAIL



10 BRICK / METER BOX DETAIL



12 GARAGE HEAD DETAIL

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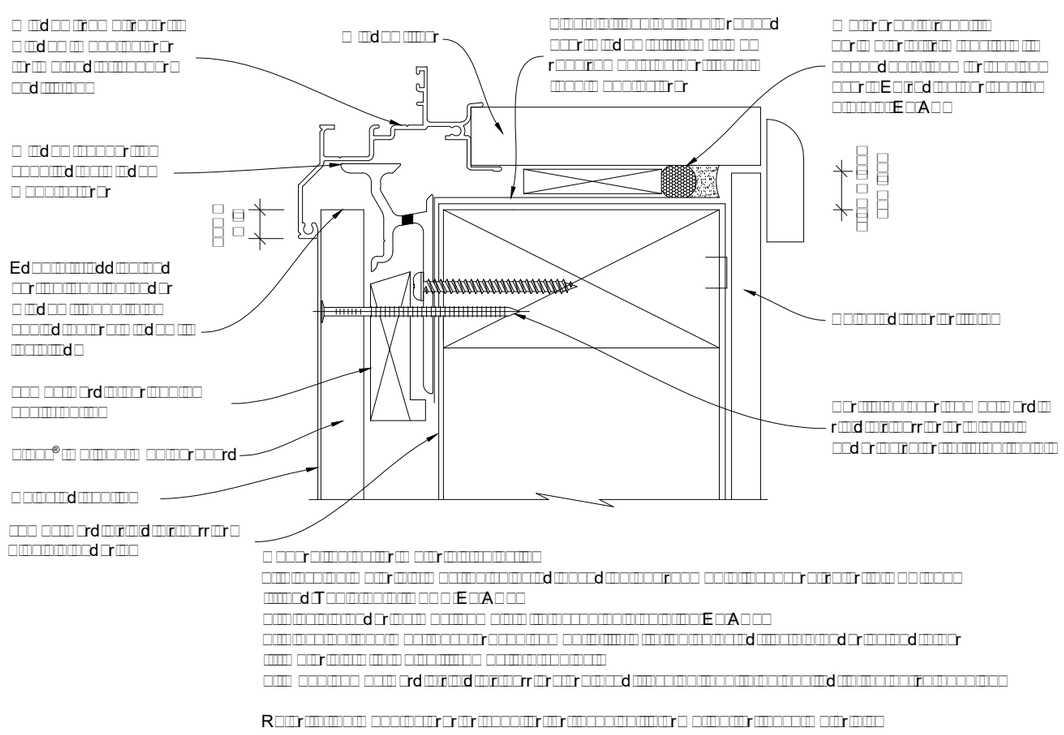

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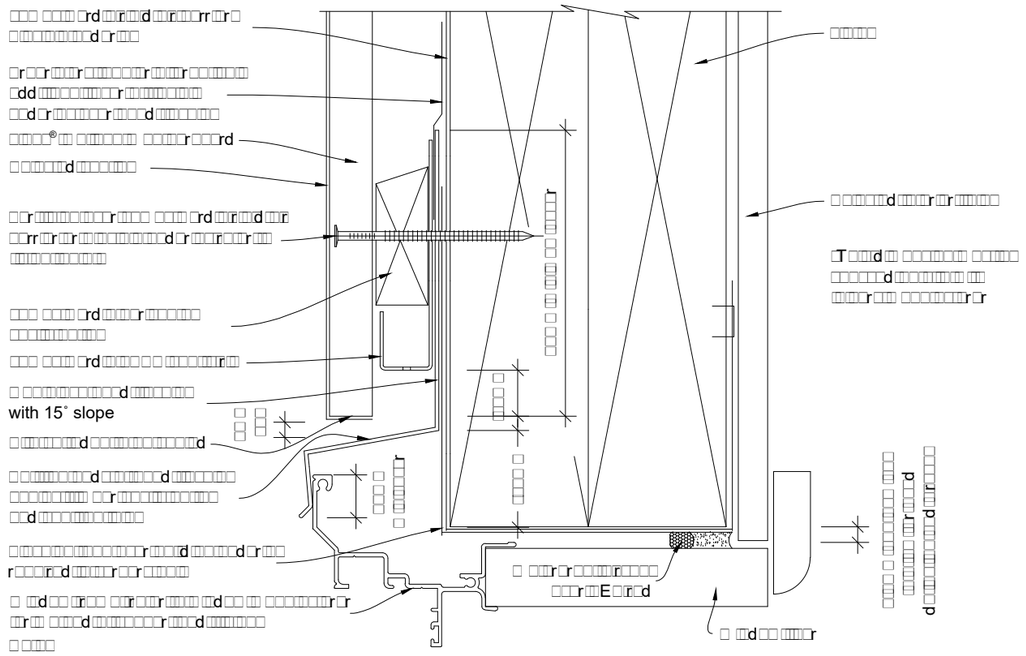

14 □ □□d□□ □□□ □□d

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1:2

Job No.:
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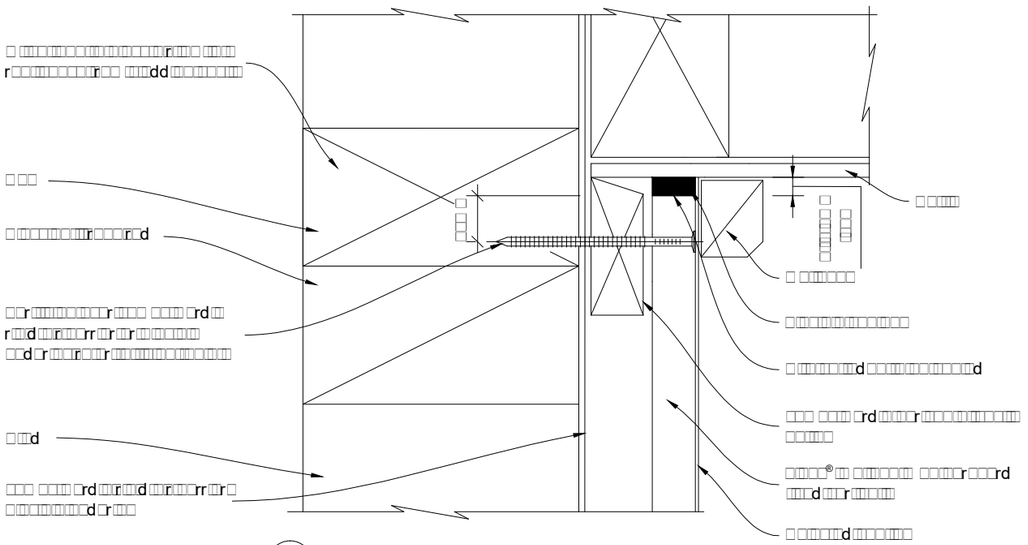
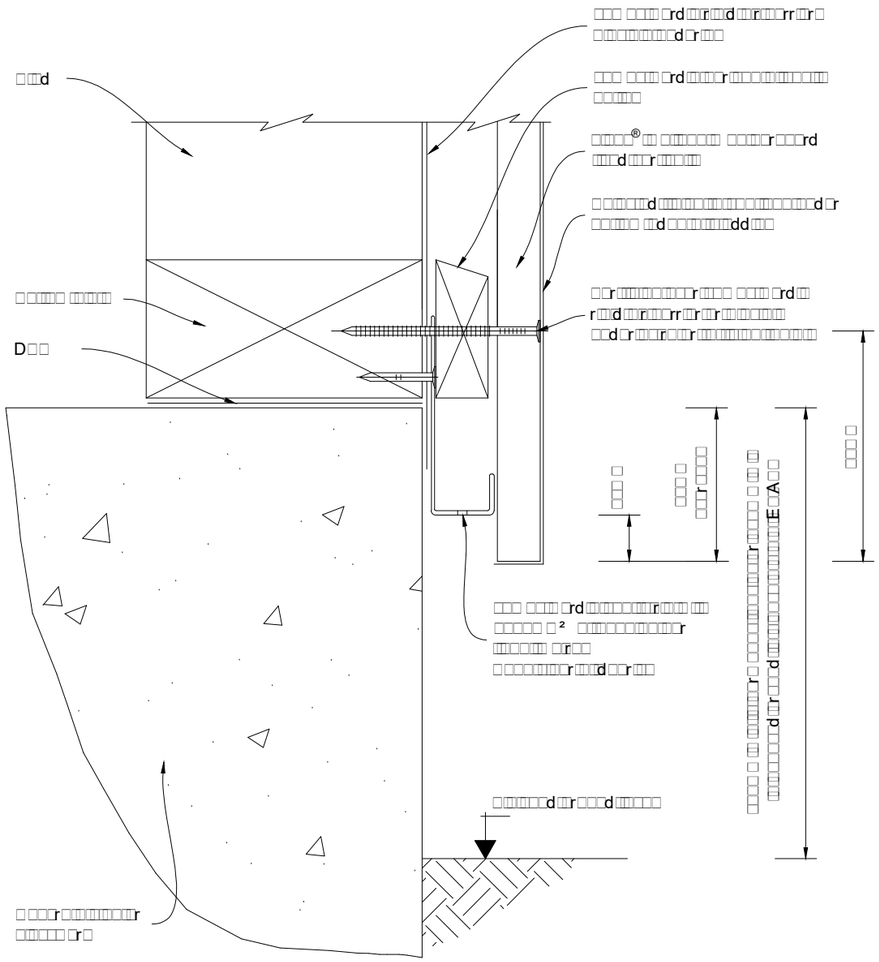
page:
16
of: 22

DATE: 30/09/2020



15 □□□□□D □□□□□



16 □□□□d □□□□□D □□□□□

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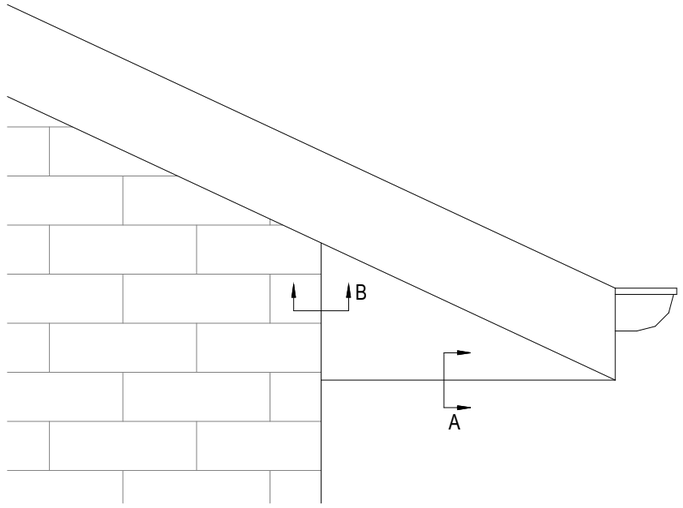
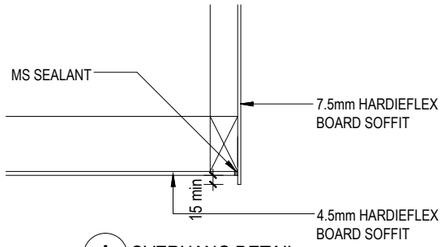
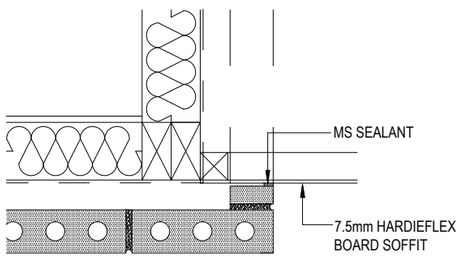


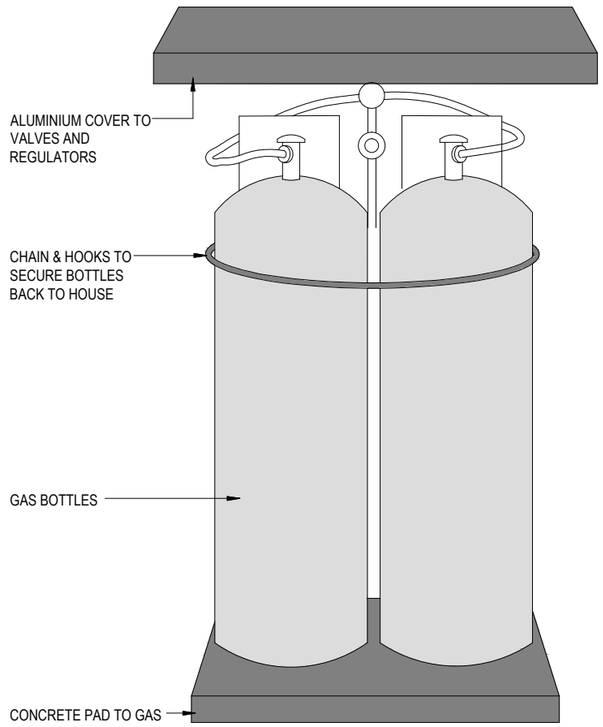
17 EAVES DETAIL



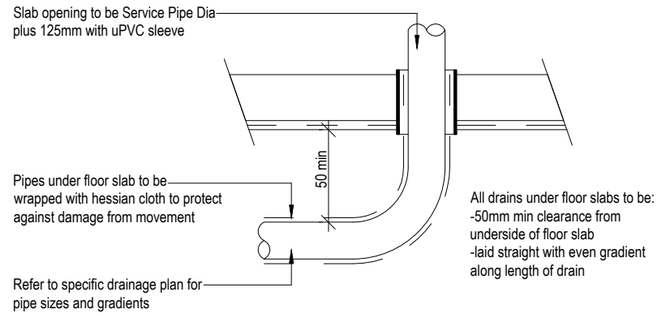
A OVERHANG DETAIL



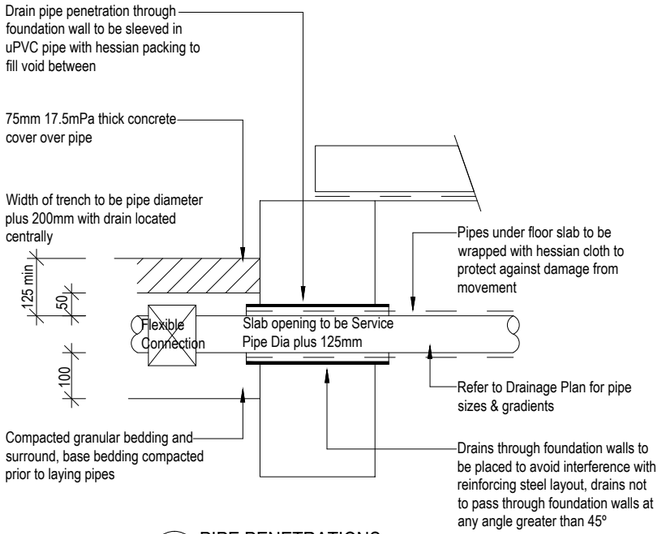
B SOFFIT DETAIL



18 GAS BOTTLES STATION



19 PIPE THROUGH FLOOR
SLAB PENETRATIONS



20 PIPE PENETRATIONS
THROUGH FOUNDATION WALLS

DETAIL APPLICABLE TO PIPES WITH A
MINIMUM COVER OF 125mm UP TO A
MAXIMUM OF 375mm

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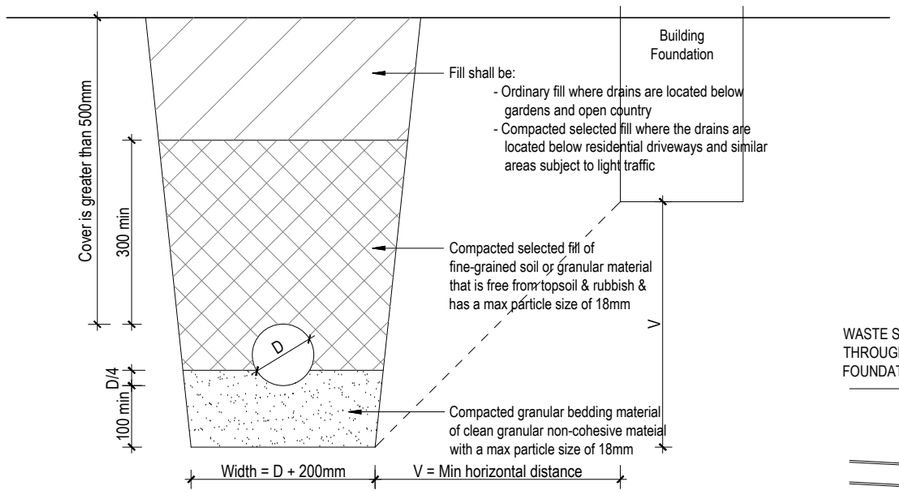
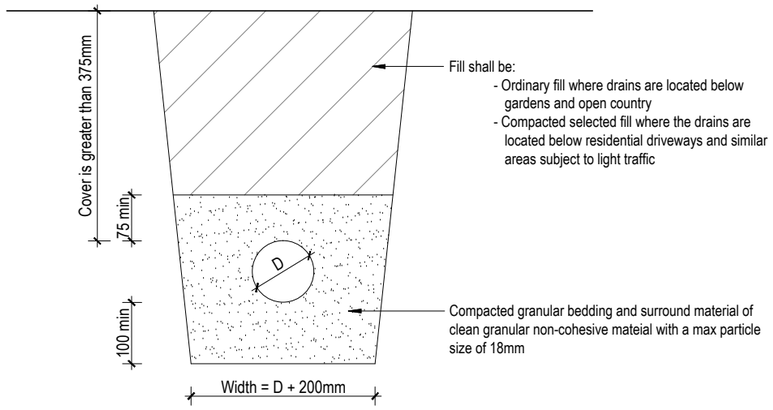
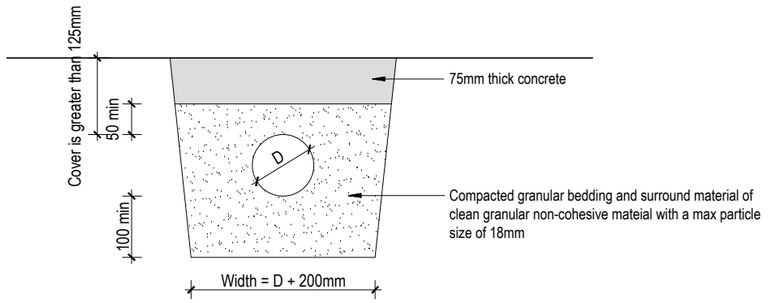


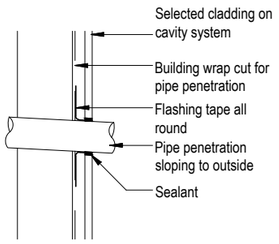
21 BEDDING TYPE 'B' OF NZS7643
Cover greater than 500mm



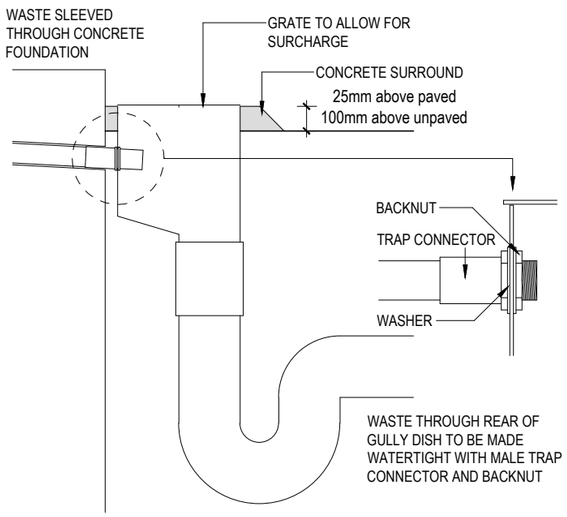
22 BEDDING TYPE 'D' OF NZS7643
Cover greater than 375mm



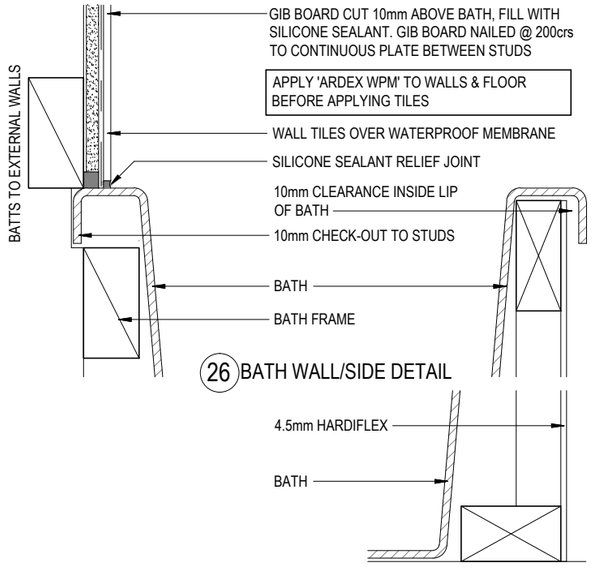
23 COVER BETWEEN 125 & 375mm



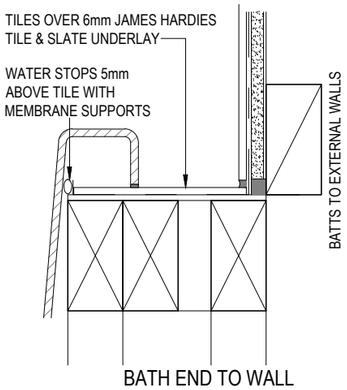
24 GENERAL PIPE PENETRATION



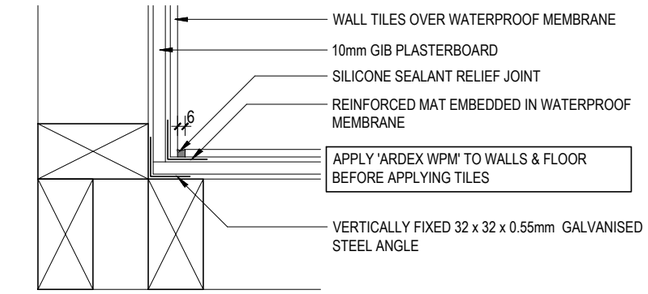
25 WASTE DISCHARGING TO REAR OF GT



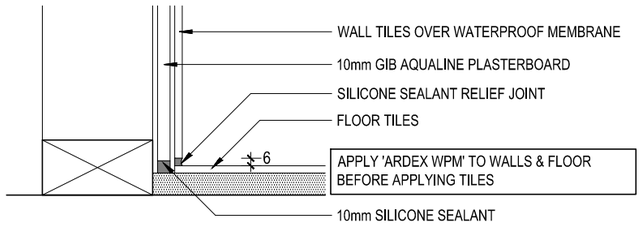
26 BATH WALL/SIDE DETAIL



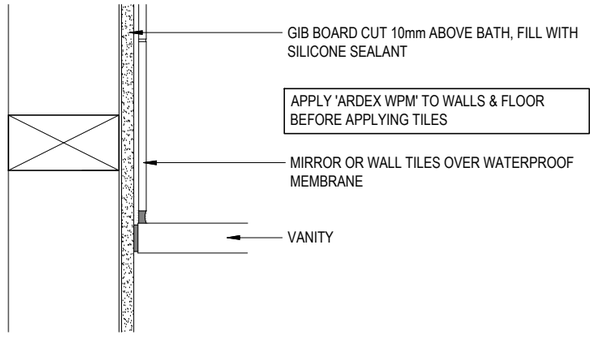
BATH END TO WALL



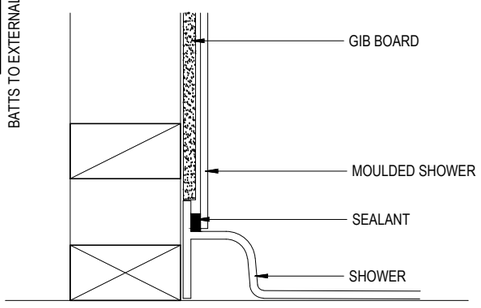
27 TILED - INTERNAL CORNER



28 TILED - WALL TO FLOOR JUNCTION



29 VANITY TO WET WALL DETAIL



30 WALL TO SHOWER JUNCTION

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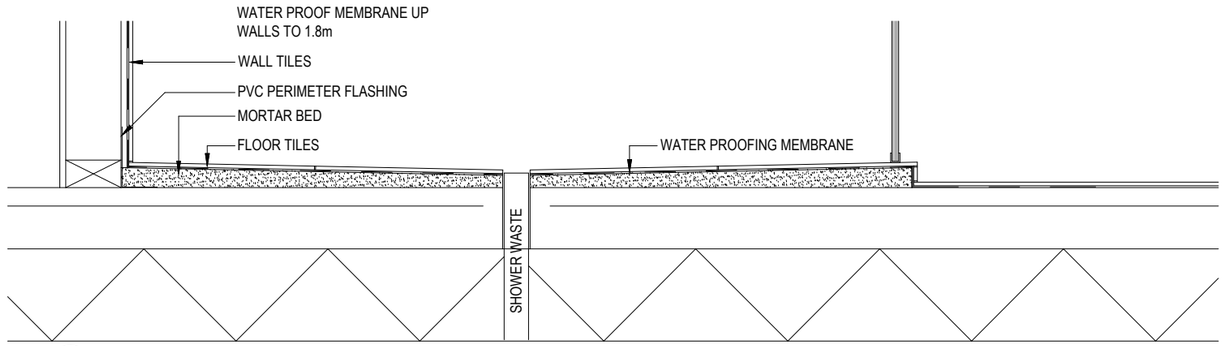
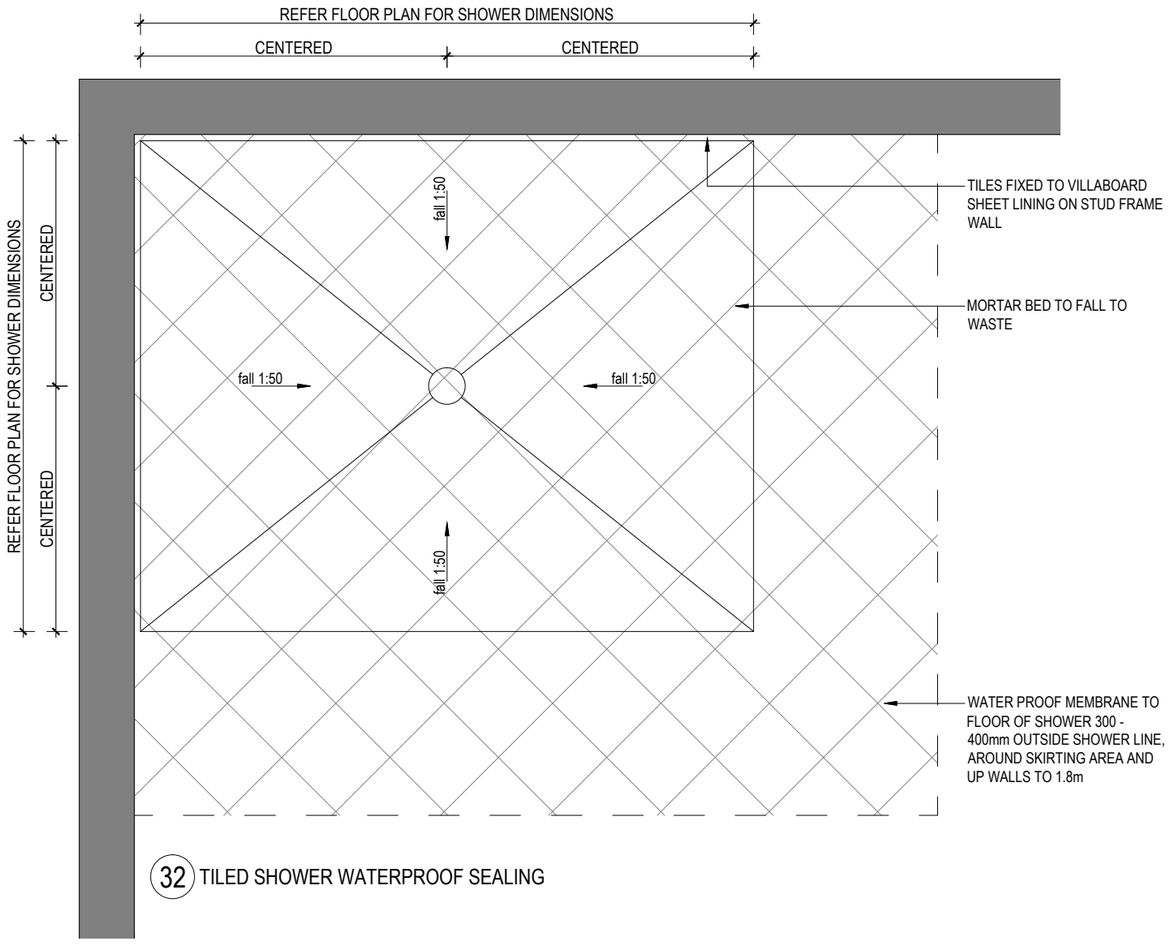
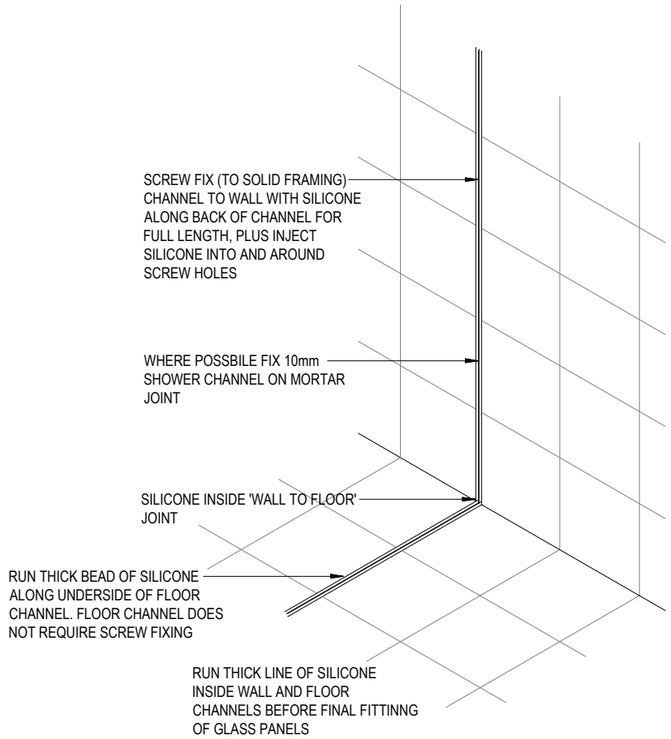


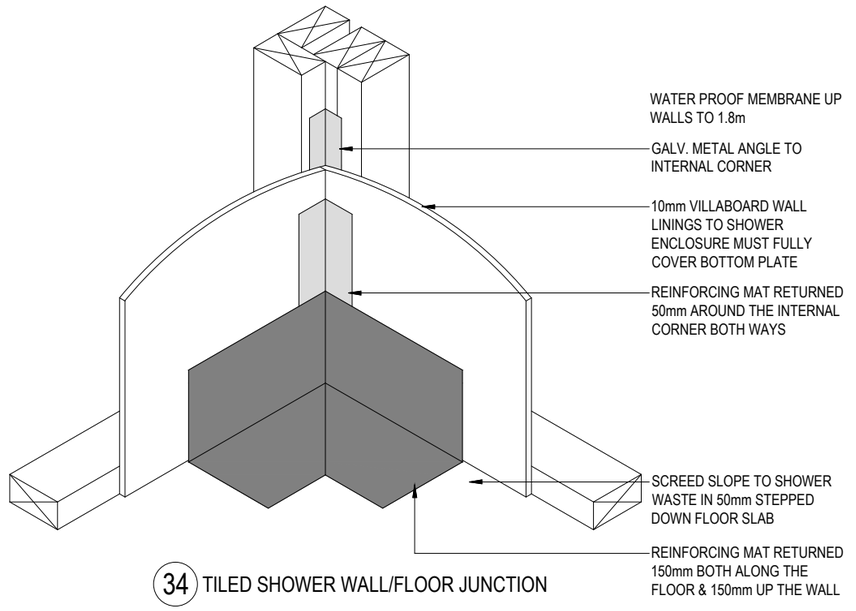
31 TILED SHOWER REBATE



32 TILED SHOWER WATERPROOF SEALING



33 GLASS SHOWER DETAIL



34 TILED SHOWER WALL/FLOOR JUNCTION

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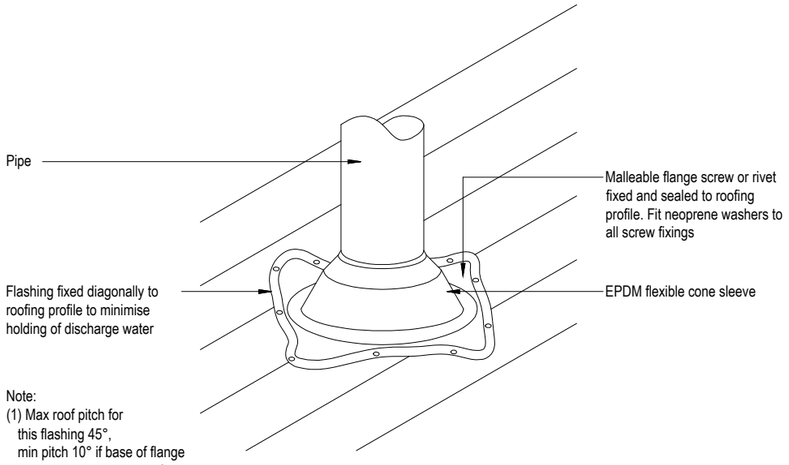
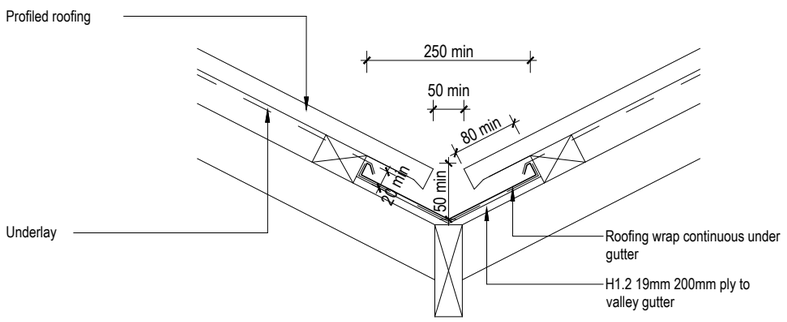
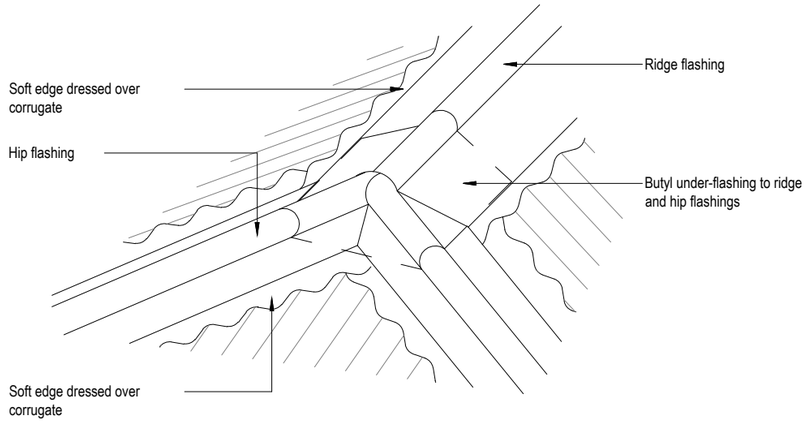


Note:
(1) Max roof pitch for this flashing 45°, min pitch 10° if base of flange covers one or more complete troughs
(2) For pipes up to 85mm dia

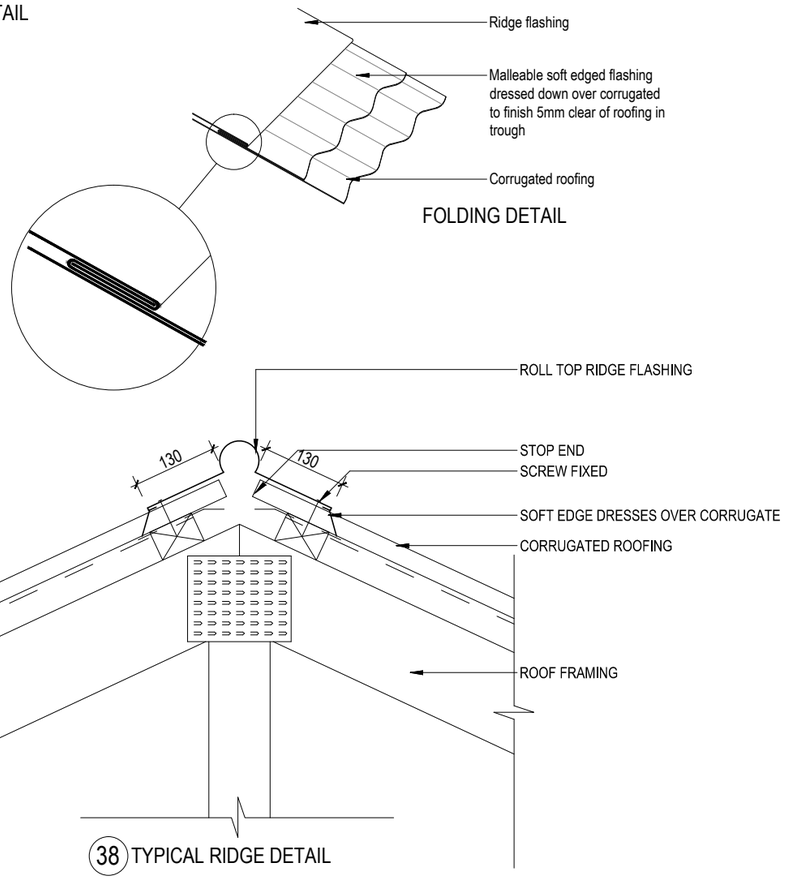
35 PENETRATION DETAIL



36 VALLEY DETAIL

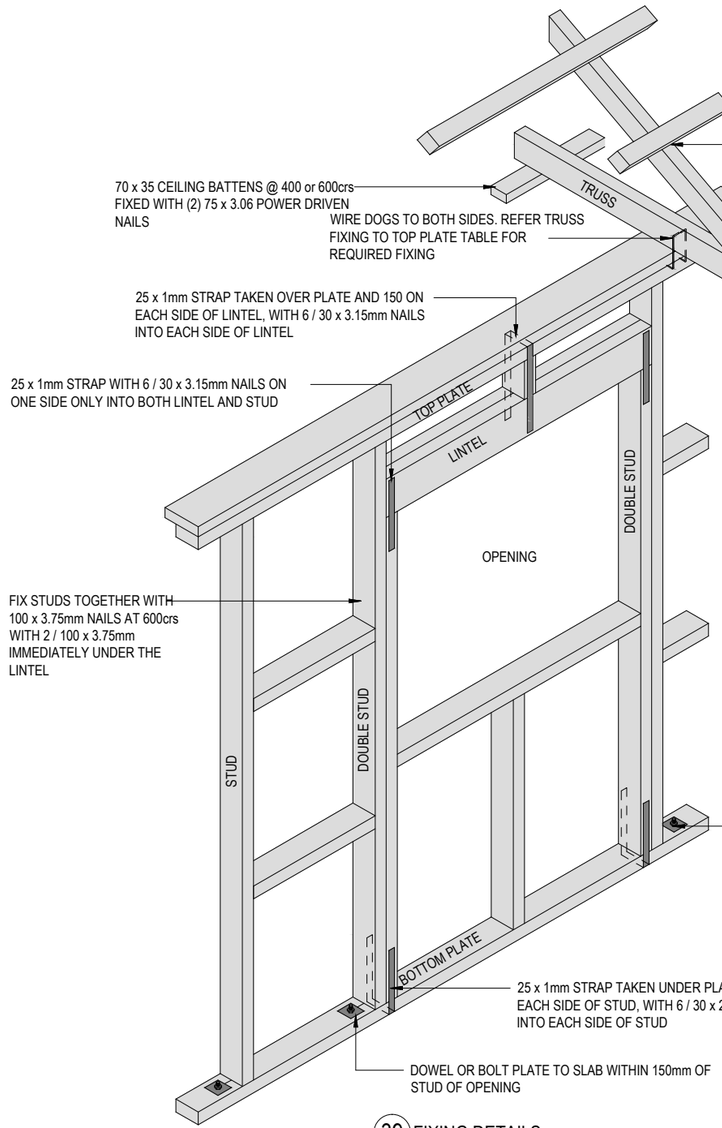


37 HIP DETAIL



38 TYPICAL RIDGE DETAIL

a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: DETAILS	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:10 Job No.: -	page: 21 of: 22 DATE: 30/09/2020



70 x 35 CEILING BATTENS @ 400 or 600crs FIXED WITH (2) 75 x 3.06 POWER DRIVEN NAILS

WIRE DOGS TO BOTH SIDES. REFER TRUSS FIXING TO TOP PLATE TABLE FOR REQUIRED FIXING

25 x 1mm STRAP TAKEN OVER PLATE AND 150 ON EACH SIDE OF LINTEL, WITH 6 / 30 x 3.15mm NAILS INTO EACH SIDE OF LINTEL

25 x 1mm STRAP WITH 6 / 30 x 3.15mm NAILS ON ONE SIDE ONLY INTO BOTH LINTEL AND STUD

FIX STUDS TOGETHER WITH 100 x 3.75mm NAILS AT 600crs WITH 2 / 100 x 3.75mm IMMEDIATELY UNDER THE LINTEL

SECURE EXTERNAL WALL BOTTOM PLATES WITH M12 BOLTS WITH 50 x 50 x 3 WASHERS @ 900 max crs NOT LESS THAN 75mm INTO CONCRETE AND NOT LESS THAN 50mm FROM SLAB EDGE. ALL EXTERNAL BOTTOM PLATES TO BE ON dpc. ALL BRACED WALLS TO HAVE M12 BOLTS AT EACH END OF BRACE

25 x 1mm STRAP TAKEN UNDER PLATE AND 150 UP EACH SIDE OF STUD, WITH 6 / 30 x 2.5mm NAILS INTO EACH SIDE OF STUD

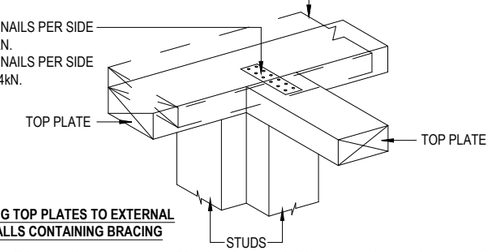
DOWEL OR BOLT PLATE TO SLAB WITHIN 150mm OF STUD OF OPENING

PURLIN FIXING
Light Roof
Truss Spacing = 900mm
Wind Zone = High

70 x 45 PURLINS @ 900mm SPAN MAX & SPACED @ 900mm MAX (FIRST PURLIN FROM FASCIA & RIDGE @ 600mm). 1 / 10g LUMBERLOK BLUE SCREW 80mm. LONGLUMBERLOK TYPE C FIXING 2.50kN. FIXING PATTERN C1 - HIT 1, MISS 1....

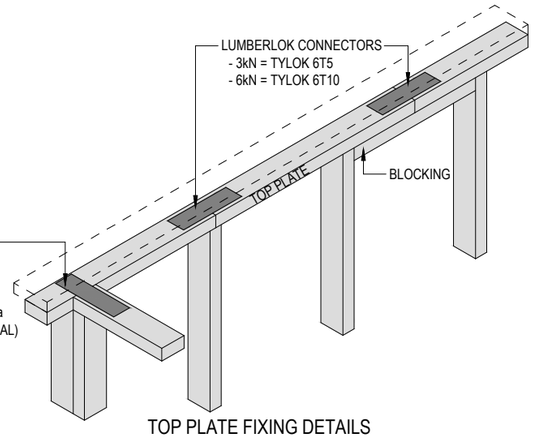
140 x 35 ADDITIONAL TOP PLATE WHEN REQUIRED

6/30 x 3.15mm NAILS PER SIDE ACHIEVING 6kN.
3/30 x 3.15mm NAILS PER SIDE ACHIEVING 2.4kN.



CONNECTING TOP PLATES TO EXTERNAL WALLS - WALLS CONTAINING BRACING

NOTE: Each wall that contains one or more wall bracing elements shall be connected at top plate level, either directly, or through fraimg memeber in the line of the wall, to external walls at right angles to it. Top plate fixinf of the capacity in tension or compression along the line of the wall bracing element are given as below.
(a) For each wall containg bracing elements with a total of not more than 250 BUs, the fixing capacity shall be 6 kN.
(b) For each wall containing bracing elements with a total of more that 250 BUs, the fixing capacity shall be 2.4kN.
Refer to NZS 3604:2011 clause 8.7.3.4



LUMBERLOK CONNECTORS
- 6kN = TYLOK 6T10
- 12kN = 2 x SHEET BRACE STRAPS FIXED WITH 6 x LUMBERLOK PRODUCT NAILS 30mm x 3.15dia PER END STRAP (24 NAILS TOTAL)

TOP PLATE FIXING DETAILS

39 FIXING DETAILS

TOP PLATE FIXING TO STUD
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Wall	Fixing Type
2.0	2 / 90 x 3.15 end nails + 2 wire dog
3.0	2 / 90 x 3.15 end nails + 2 wire dog
4.0	2 / 90 x 3.15 end nails + 2 wire dog
5.0	2 / 90 x 3.15 end nails + 2 wire dog
6.0	2 / 90 x 3.15 end nails + 2 wire dog

TRUSS FIXING TO TOP PLATE
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Support	Fixing Type
3.0	2 / 90 x 3.15 skewed nails + 2 wire dog
3.5	2 / 90 x 3.15 skewed nails + 2 wire dog
4.0	2 / 90 x 3.15 skewed nails + 2 wire dog
4.5	2 / 90 x 3.15 skewed nails + 2 wire dog
5.0	2 / 90 x 3.15 skewed nails + 2 wire dog
5.5	2 / 90 x 3.15 skewed nails + strap fixing
6.0	2 / 90 x 3.15 skewed nails + strap fixing

a . s . c . a . d . limited
ascadltd@snap.net.nz
0272 838 775

job title: BUNN HOUSE

drawing title: DETAILS

legal description: Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK

DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES

scale: 1:10

Job No.: -

DATE: 30/09/2020

GENERAL

1. These drawings are not to be used for construction until the plan (sheet S2) is signed by the main contractor

2. Do not scale. refer any discrepancies to the architect/engineer.

3. These drawings are to be read in conjunction with the Architects & Engineers drawings.

4. The builder shall be responsible for any damage to works during construction.

5. The sand blinding layer shall be 20mm min. & 50mm max. to aid levelling & to prevent rocking of pods.

6. Vapour barrier to be 0.25mm (250 micron) polythene complying with NZS 4229. / NZS 3604

7. Finished ground level adjacent to slab to be protected from wind, water erosion and undermining.

FOUNDATIONS

1. For assumed allowable bearing capacity refer to calculations/installer guide. Unless otherwise noted in documentation

2. If there is any doubt about the integrity of the material on which the slab is to be founded - an Engco representative must be notified immediately.

CONCRETE

1. All workmanship & materials to conform to NZS 3109, NZS 4210 & local authority regulations.

2. Minimum covers to reinforcement:

- Exposed to earth - 75mm.
- Protected by vapour barrier - 50mm.
- Not exposed to weather except for a brief period during construction - 25mm.

3. No holes or chases other than those specified are to be made in the slab without the approval of the Engineer.

4. All concrete shall be 20 MPa FIRTH Raftmix grade with 20mm nominal maximum aggregate size & 120mm slump & shall comply with NZS 3109.

5. All concrete to be mechanically vibrated & carefully worked around the reinforcement & into the corners of the formwork.

INSPECTIONS

Inform ENGCO consulting 48 hours in advance of any inspections required for code compliance certification.
Contact ENGCO - Ph. 03 366 7955 & quote ENGCO Ref. No.

INSPECTIONS REQUIRED

1. Site Strip - Bearing Capacity Confirmation.

2. Pre-pour of slab

STEEL

1. All reinforcing shall be new Zealand sourced and conform to AS/NZS 4671 :2001 in grade 300 or grade 500E.

2. All bends to be made cold without fracture.

3. All reinforcing shall be deformed type unless otherwise stated.

4. Grade 500E deformed bars shall be designated 'H', Grade 300 deformed bars shall be designated 'D' and Grade 300 round bars shall be designated 'R'

5. Minimum bar splice 720mm. (or unless otherwide noted)

6. All reinforcement to be fixed & tied where necessary in its specified position.

7. Welding of steel is not permitted

8. Spacers:

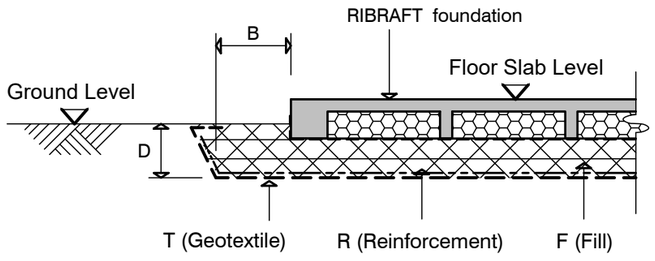
- Edge at 1200mm ctrs (one on edge & two on corners, typically).
- Internal one on each side of pod (typically).
- 50mm mesh chairs to be used

9. All mesh shall comply with AS/NZS 4671 & shall conform with elongation requirements exceeding 10%.

10. All Mesh shall lap a minimum of 250 m.m.
(ensure end extensions are not included in lap length)

GEOTECHNICAL REFERENCE:

Refer: Aurecon
Ref. 235361
Dated: 21st August 2020



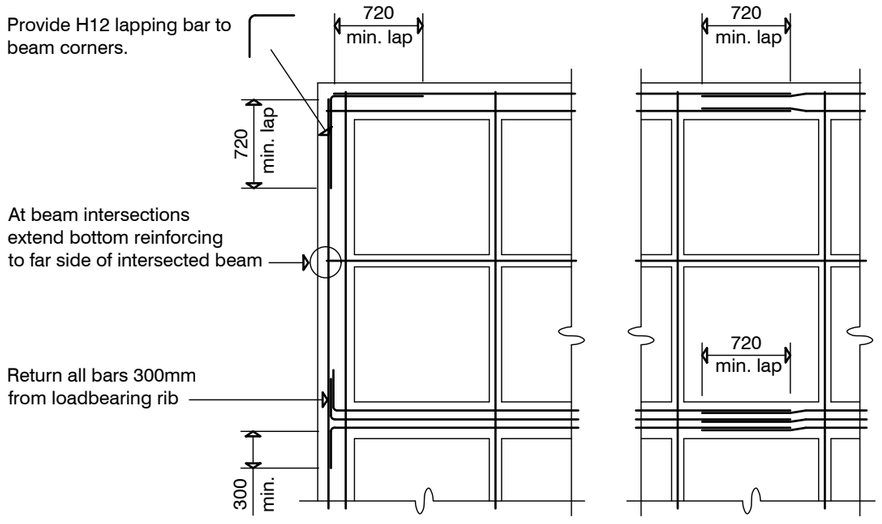
BUILDING PLATFORM

N.T.S.

BUILDING PLATFORM TABLE:	
B	300mm
D	Strip turfed top soil to 150mm approx. depth - confirm soil condition before backfilling
T	Not Required
R	Not Required
F	AP40 or AP65 fill. - 95% Dry Density. Compact in 200mm layers (max.) Fill as required to suit FFL, allow for 20mm coarse sand blinding min.

Refer to Architects drawings for finished floor level

Provide H12 lapping bar to beam corners.



TYPICAL CORNER STEEL & MIN. LAPPING REQUIREMENTS

N.T.S.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

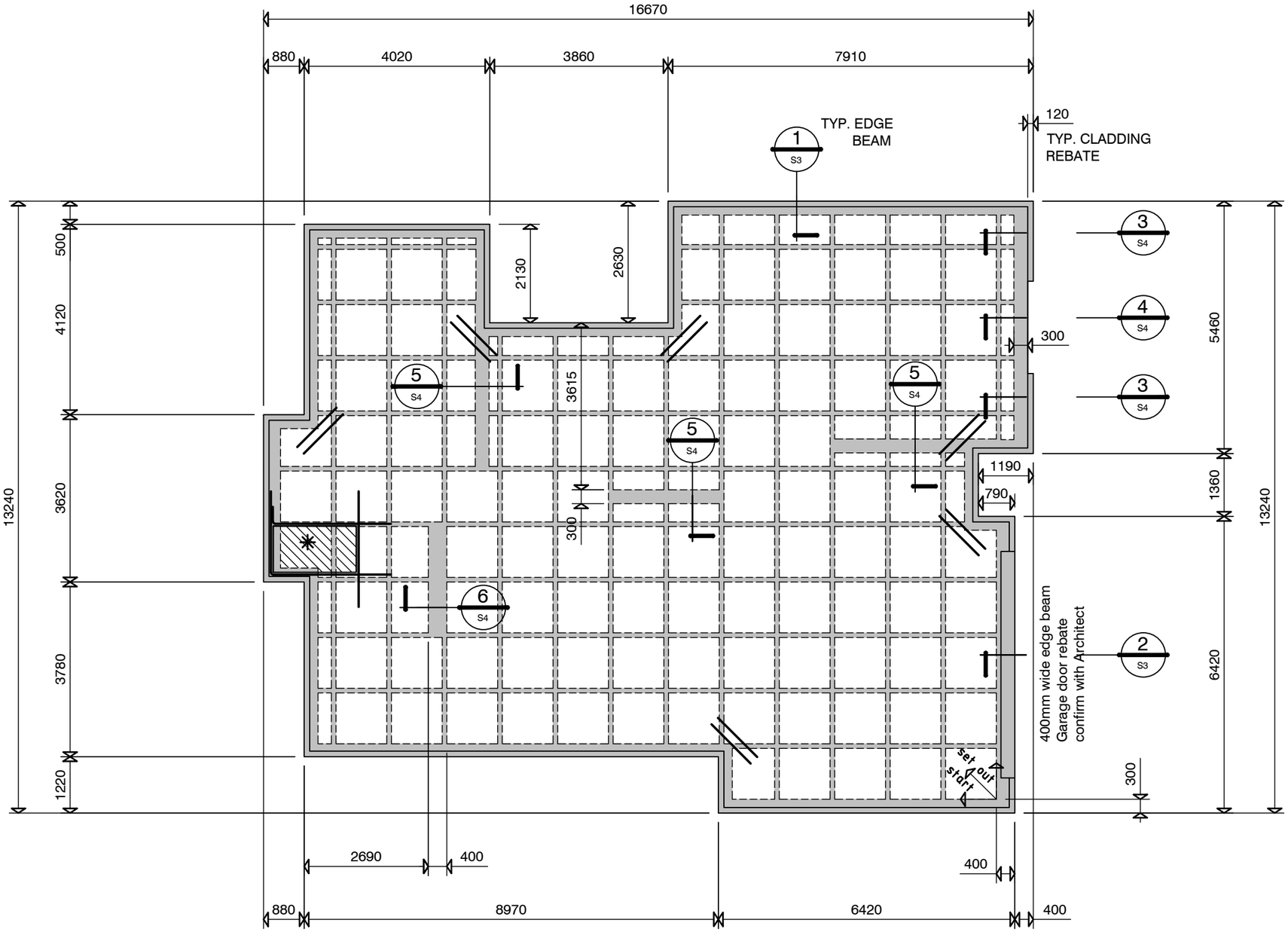
BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

GENERAL NOTES

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
dwg S1
rev.

contractor shall verify all dimensions before commencing work



GENERAL NOTES:

Locations shown of internal floor beam thickenings are indicative only. It shall be the responsibility of the Contractor to ensure that they are located centrally under the load bearing walls to which they pertain.

Under no circumstance should pipework for services be run longitudinally in 100mm ribs. Similarly they should not be run along perimeter foundations nor internal floor beam thickenings

Vertical or horizontal penetrations through the foundation edge beam or floor beam thickenings must be made through the middle third of the member - refer Firth Ribraft Technical Solutions manual for specific information. Vertical penetrations should not be made through 100 mm ribs.

KEY:

(2) H12 (x1200) at 200 centres.

85 m.m. Floor Slab - 220mm pods
(20 MPa FIRTH Raftmix)
G500 E SE62 Ductile mesh.

All Mesh shall lap a minimum of 250 m.m.
(End extensions not included).

✳ 50mm shower rebate, maintain min. slab thickness
Trim perimeter with H12. extending 750mm past (typ.) (or 300mm return)
Refer to Architects drawings for setout dimensions

RIBRAFT FOUNDATION LAYOUT PLAN

1:100

Confirm all dimensions with Architectural Drawings.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

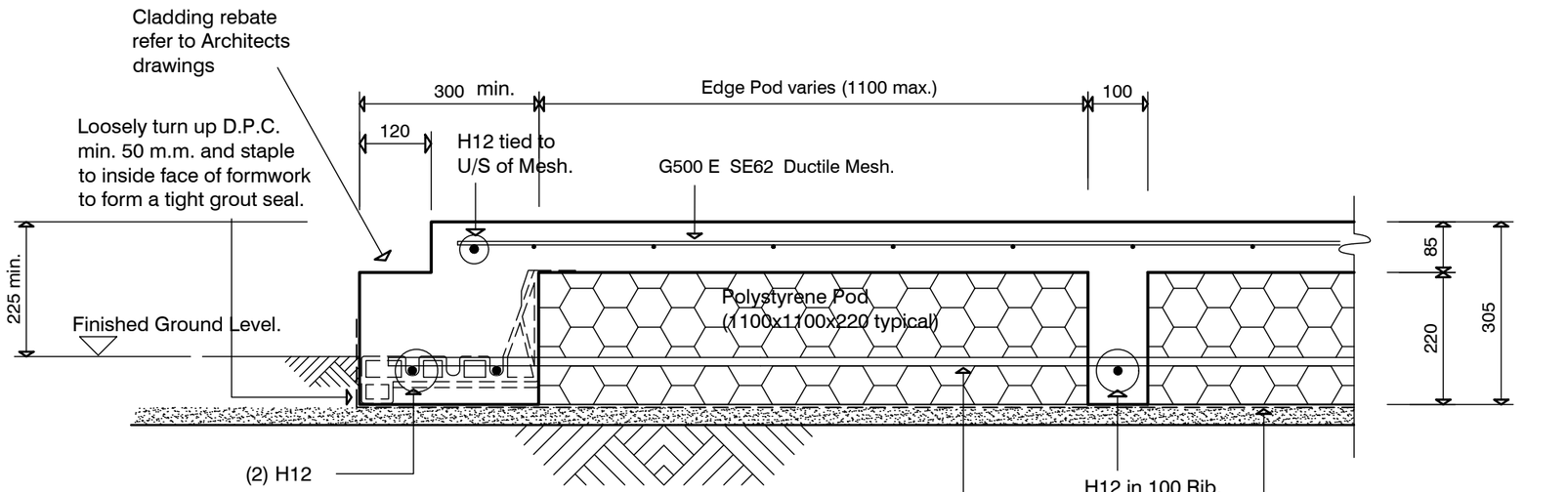
RIBRAFT LAYOUT
FOUNDATION PLAN

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26

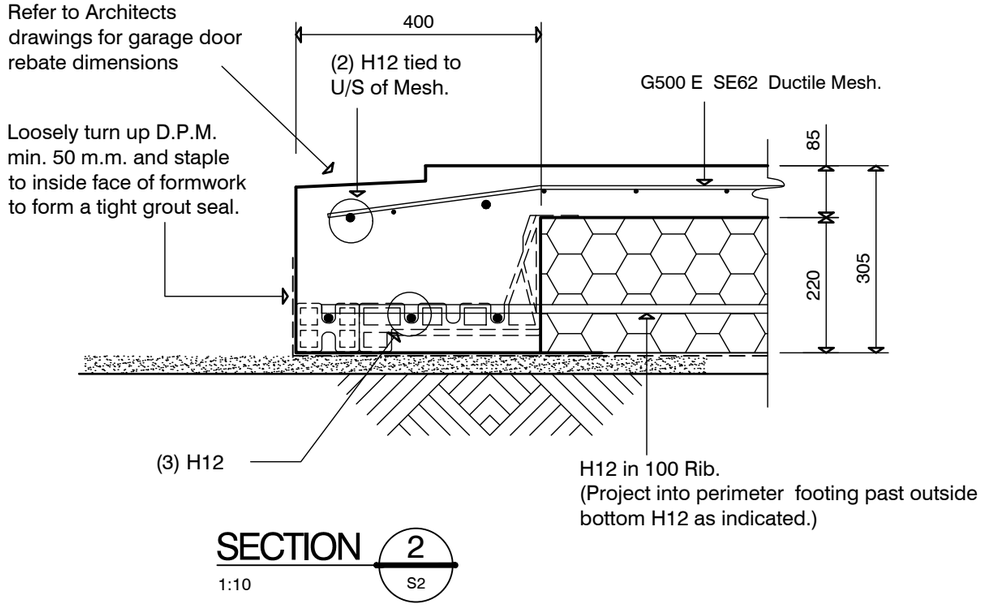
dwg S2

rev.

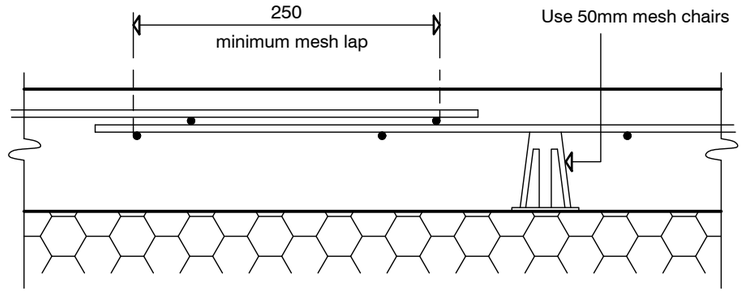


SECTION 1 / S2
1:10

TYPICAL PERIMETER BEAM



SECTION 2 / S2
1:10



TYPICAL MESH LAP & CHAIR REQUIREMENTS
1:5

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

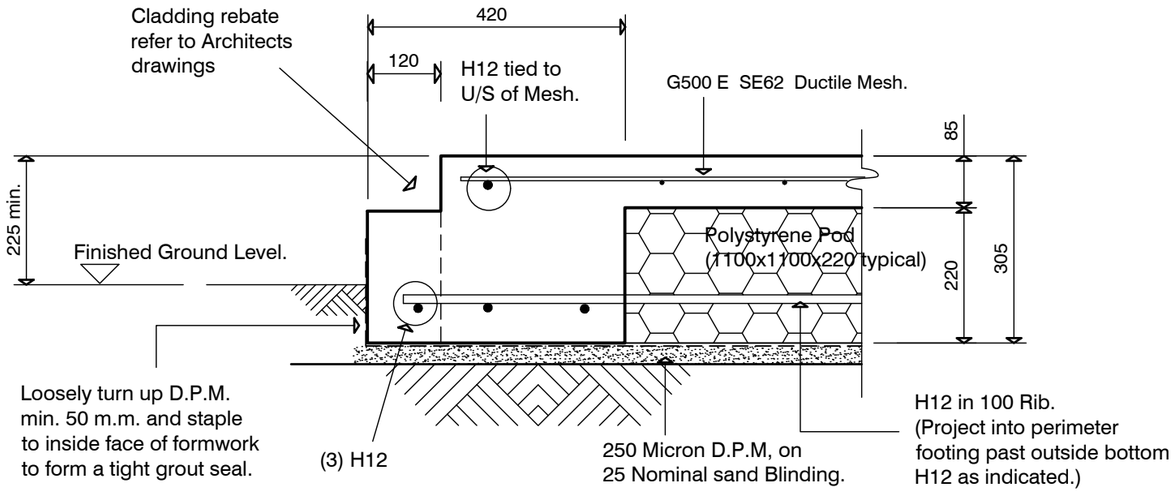
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

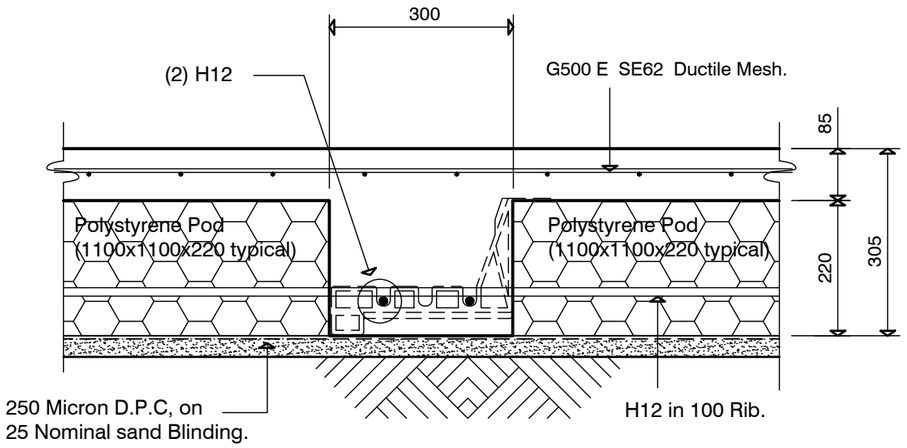
TYPICAL FOUNDATION SECTIONS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26
dwg	S3
rev.	



SECTION 3
1:10 S2



SECTION 5
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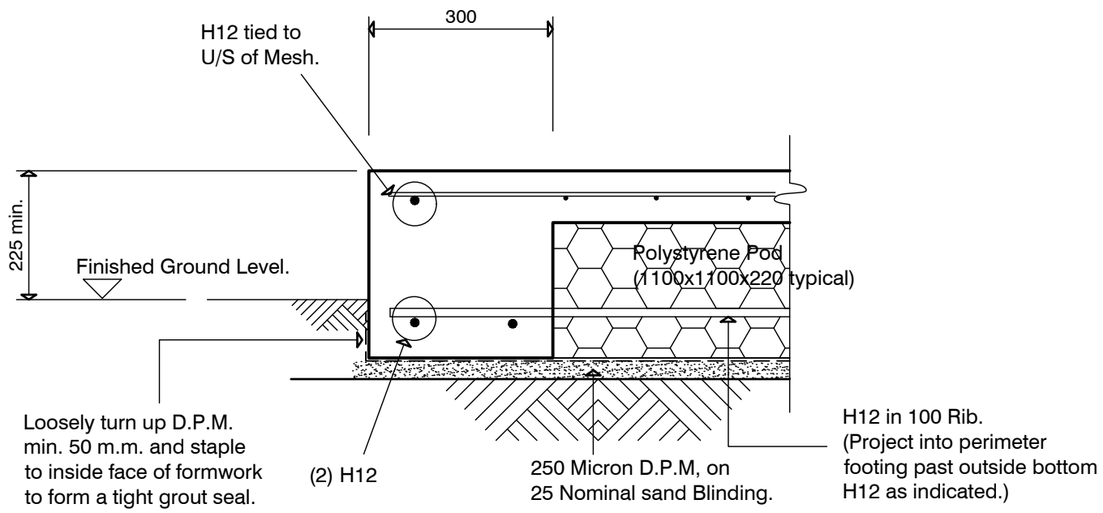
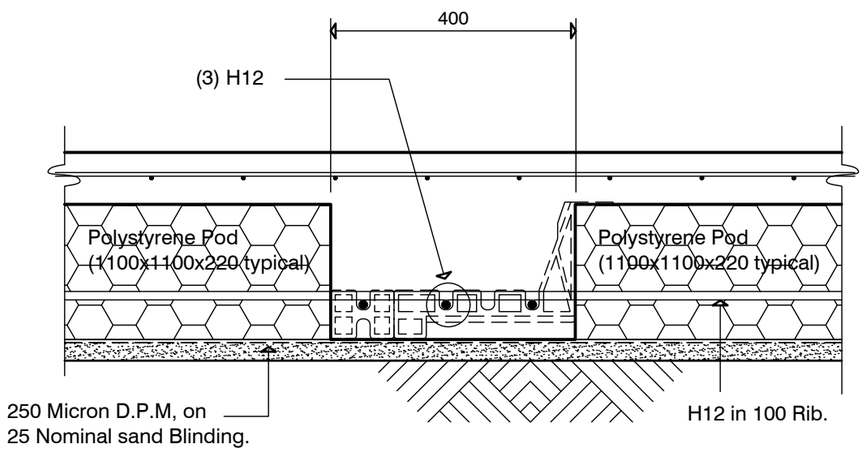


SECTION 4
1:10 S2



SECTION 6
1:10 S2

ORIGINAL SIZE = A3

Rev.			

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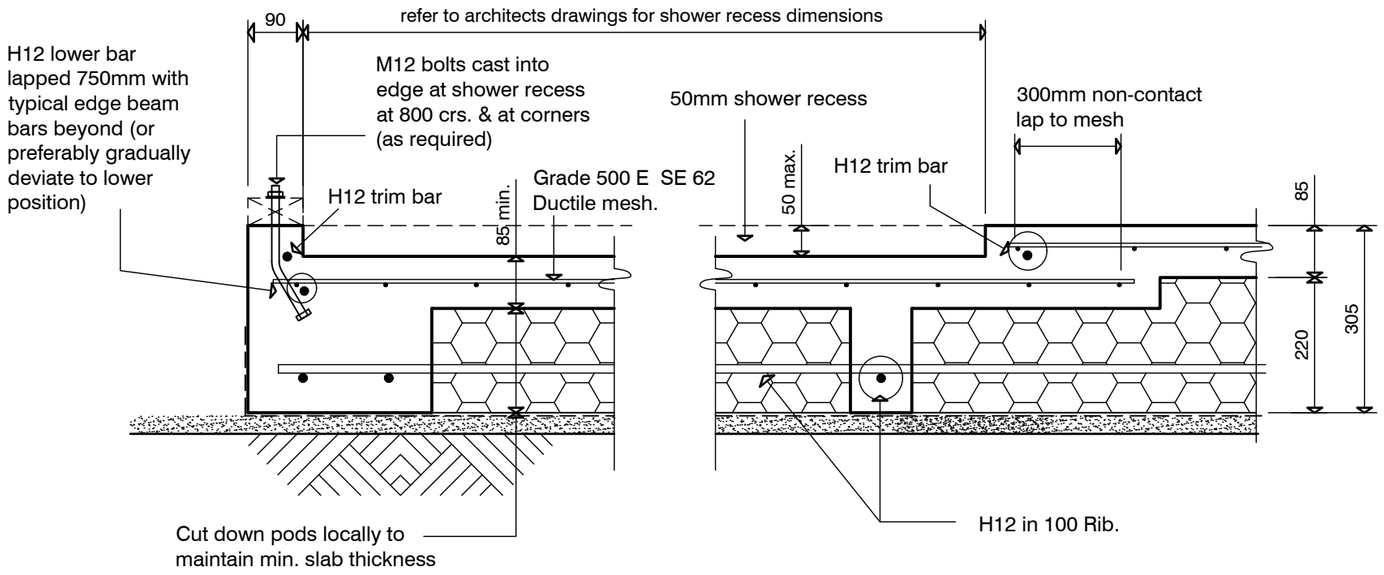
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
dwg S4
rev.



TYPICAL SHOWER RECESS

1:10

ORIGINAL SIZE = A3

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ENGCO Consulting Engineers

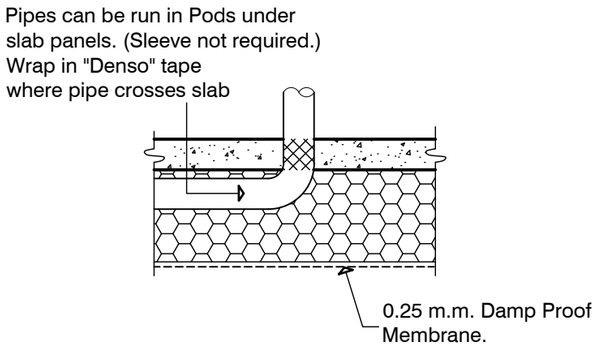
ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

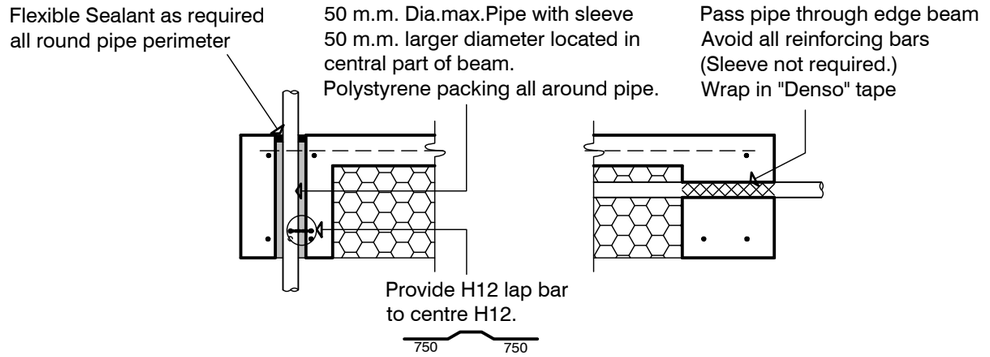
design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26	
dwg	S5	rev.



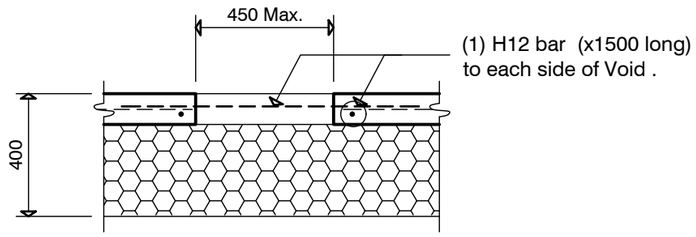
SLAB SERVICES PENETRATION DETAIL.

1:20



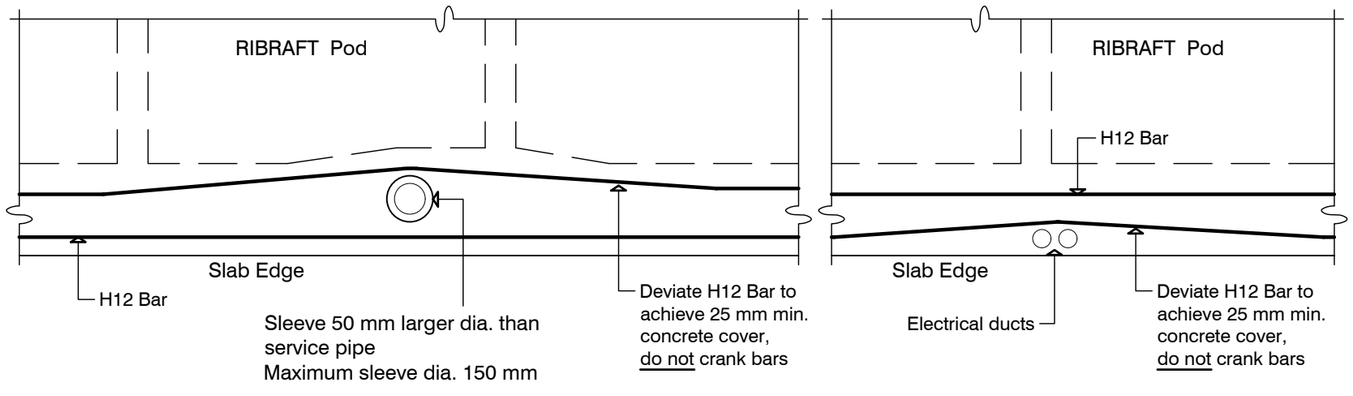
FOUNDATION SERVICES PENETRATION DETAILING.

1:20



LARGE SLAB PENETRATION DETAIL.

1:20



FOUNDATION SERVICES PENETRATION DETAILING

1:20

Services shall not run along ribs or edge beams.

PIPE NOTE:
No separation required where
pipes are fully contained within slab.
Sleeve all drains that pass through the
base of the slab.

PENETRATIONS NOTE:
Where penetrations through
Floor Slab exceed 500 m.m. Square,
Crack Control Bars will be required.

Ideally, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, but this may not always be possible. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams.
The maximum diameter of the services shall be as outlined in table below.

MAXIMUM DIAMETER OF PIPE SERVICES		
ELEMENT	**VERTICAL SERVICES**	**HORIZONTAL SERVICES**
300mm wide edge beam	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, unless detailed as per note 1.
500mm localised wide edge beam	100mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
300mm wide internal load bearing rib	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
100mm wide internal rib	Nil	50mm in a duct 50mm larger diameter than pipe, see note 1.
Slab	110mm in a duct 50mm larger diameter than pipe or for large services 450mm square see also note 2.	Nil

(1) The need for a duct 50mm larger than the service diameter can be deleted when the pipe work does not cross the interface between the bottom of the RibRaft system and the ground at any point along its length. An example would be services laid within the plane of the pods and passing through the edge beam and discharging to a gully trap or similar. In these cases the diameter of the service can be increased to a maximum of 100mm and a service duct is not required. The pipe work shall be wrapped in denso tape where it crosses concrete elements to prevent adhesion between the concrete and pipe work.

ORIGINAL SIZE = A3

Rev.			

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL SERVICES
PENETRATION DETAILS

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file	20005.26
dwg	S6
rev.	

CERT OF TITLE
or S & P

ADLS | REINZ

Tenth Edition 2019

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

This form is approved by the Real Estate Institute of New Zealand Incorporated and by Auckland District Law Society Incorporated.

DATE: Jul 10, 2020

VENDOR: CDL Land New Zealand Limited

PURCHASER: Lynley Claire BUNN **and/or nominee**

The vendor is registered under the GST Act in respect of the transaction evidenced by this agreement and/or will be so registered at settlement: **Yes/~~No~~**

PROPERTY

Address: Lot 460 Stage T6, U2, T7 and E1, Prestons Park Subdivision

Estate: **FREEHOLD** ~~**LEASEHOLD**~~ ~~**STRATUM IN FREEHOLD**~~ ~~**STRATUM IN LEASEHOLD**~~
~~**CROSSLEASE (FREEHOLD)**~~ ~~**CROSSLEASE (LEASEHOLD)**~~ (freehold if none is deleted)

Legal Description:

Area (more or less):	***Lot/Flat/Unit:***	***DP:***	***Record of Title (unique identifier):***
495sqm2	460		

As shown on the attached stage Subdivision Plan, subject to the Further Terms of Sale (a separate title for the Property is yet to issue).

PAYMENT OF PURCHASE PRICE

Purchase price: $ 253,000

Two Hundred & Fifty Three Thousand Dollars.

~~**Plus GST (if any) OR**~~ **Inclusive of GST** (if any)
If neither is deleted, the purchase price includes GST (if any).

GST date (refer clause 13.0): The settlement date

Deposit (refer clause 2.0): $ 5% of the purchase price inclusive of GST (if any) payable to Professionals Christchurch Limited upon the last of the Purchaser's conditions being satisfied.

Balance of purchase price to be paid or satisfied as follows:

(1) By payment in cleared funds on the settlement date which is 5 working days after the Vendor notifies the Purchaser that a search copy of the separate title for the Property is available or 30th September 2020 whichever is the later.

OR ~~(2) In the manner described in the Further Terms of Sale.~~

Interest rate for late settlement: 15 **% p.a.**

CONDITIONS (refer clause 9.0)

~~**Finance required (subclause 9.1):** Yes/No~~
~~**Finance date:**~~
~~**LIM required (subclause 9.3):** Yes/No~~
~~**Building report required (subclause 9.4):** Yes/No~~
~~**Toxicology report required (subclause 9.5):** Yes/No~~

OIA consent required (subclause 9.6): ~~Yes~~/No
~~**OIA date (subclause 9.8):**~~
~~**Land Act consent required (subclause 9.7):** Yes/No~~
~~**Land Act date (subclause 9.8):**~~

~~**TENANCIES** Yes/No~~
Name of Tenant(s):

~~Particulars of any tenancies are set out in Schedule 4 or another schedule attached to this agreement by the parties.~~

SALE BY: Professionals Christchurch Limited

Licensed Real Estate Agent under Real Estate Agents Act 2008

It is agreed that the vendor sells and the purchaser purchases the property, and the chattels included in Schedules 2 and 3, on the terms set out above and in the General Terms of Sale and any Further Terms of Sale.

JCA JCA LB LB

FURTHER TERMS OF SALE

Refer to the Prestons Park Subdivision Further Terms of Sale for Stage T6, U2, T7 and E1, being Lots 398-406, 457-479, and 704-705 as attached.

JCA JCA LB LB

30. Solicitor's Approval Condition

30.1 This Agreement is conditional on the Purchaser's solicitor's approval of the form and content (including commercial matters) of this Agreement, within 10 (ten) working days after the date of this Agreement.

31. Geotech Report Condition JCA JCA LB LB

31.1 This Agreement is conditional on the Purchaser's approval of a geotechnical report in relation to the Property, within 5 working days after the Vendor first makes the report available to the Purchaser, or 5 working days after the date of this Agreement, whichever is the later.

32.0 Finance JCA JCA LB LB

32.1 This agreement is subject to and conditional upon the Purchaser(s) obtaining finance to enable the Purchaser(s) to complete the purchase of the property on terms and conditions satisfactory to the Purchaser(s) in all respects within 10 (ten) working days and by 4.00pm on the last day for confirmation.
This condition is inserted for the sole benefit of the Purchaser(s).

JCA JCA LB LB

33.0 Deposit

33.1 The person to whom the deposit is paid shall hold it as stakeholder until this agreement becomes unconditional or is earlier validy cancelled or avoided.

WARNING *(This warning does not form part of this agreement)*

This is a binding contract. Read the information set out on the back page before signing.

Acknowledgements

Where this agreement relates to the sale of a residential property and this agreement was provided to the parties by a real estate agent, or by a licensee on behalf of the agent, the parties acknowledge that they have been given the guide about the sale of residential property approved by the Real Estate Authority.

Where this agreement relates to the sale of a unit title property, the purchaser acknowledges that the purchaser has been provided with a pre-contract disclosure statement under section 146 of the Unit Titles Act.

Signature of Purchaser(s):

L C BUNN
L C BUNN (Jul 8, 2020 17:25 GMT+12)

Director / Trustee / Authorised Signatory / Agent / Attorney*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Director / Trustee / Authorised Signatory / Agent / Attorney*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Signature of Vendor(s):

Jason Craig Adams
Jason Craig Adams (Jul 10, 2020 16:34 GMT+12)

Director / ~~Trustee~~ / ~~Authorised Signatory~~ / ~~Agent~~ / ~~Attorney~~*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

Director / ~~Trustee~~ / ~~Authorised Signatory~~ / ~~Agent~~ / ~~Attorney~~*
Delete the options that do not apply
If no option is deleted, the signatory is signing in their personal capacity

*If this agreement is signed under:

(i) a Power of Attorney – please attach a **Certificate of non-revocation** (available from ADLS: 4098WFP or REINZ); or
(ii) an Enduring Power of Attorney – please attach a **Certificate of non-revocation and non-suspension of the enduring power of attorney** (available from ADLS: 4997WFP or REINZ); or
(iii) where the attorney signs for a trustee, a Certificate in the relevant form in Schedule 4 to the Trustee Act 1956.

Also insert the following wording for the Attorney's Signature above:
Signed for [full name of the donor] by his or her Attorney [attorney's signature].

BEFORE SIGNING THE AGREEMENT

- Note: the purchaser is entitled to a copy of any signed offer at the time it is made.
- It is recommended both parties seek professional advice before signing. This is especially so if:
  - there are any doubts. Once signed, this will be a binding contract with only restricted rights of termination.
  - the purchaser is not a New Zealand citizen. There are strict controls on the purchase of a property in New Zealand by persons who are not New Zealand citizens.
  - property such as a hotel or a farm is being sold. The agreement is designed primarily for the sale of residential and commercial property.
  - the property is vacant land in the process of being subdivided or there is a new unit title or cross lease to be issued. In these cases additional clauses may need to be inserted.
  - there is any doubt as to the position of the boundaries.
  - the purchaser wishes to check the weathertightness and soundness of construction of any dwellings or other buildings on the land.
- Both parties may need to have customer due diligence performed on them by their lawyer or conveyancer in accordance with the Anti-Money Laundering and Countering Financing of Terrorism Act 2009 which is best done prior to the signing of this agreement.
- The purchaser should investigate the status of the property under the Council's District Plan. The property and those around it are affected by zoning and other planning provisions regulating their use and future development.
- The purchaser should investigate whether necessary permits, consents and code compliance certificates have been obtained from the Council where building works have been carried out. This investigation can be assisted by obtaining a LIM from the Council.
- The purchaser should compare the title plans against the physical location of existing structures where the property is a unit title or cross lease. Structures or alterations to structures not shown on the plans may result in the title being defective.
- In the case of a unit title, before the purchaser enters into the agreement:
  - the vendor **must** provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act;
  - the purchaser should check the minutes of the past meetings of the body corporate, enquire whether there are any issues affecting the units and/or the common property, check the body corporate's long term maintenance plan and enquire whether the body corporate has imposed or proposed levies for a long term maintenance fund or any other fund for the maintenance of, or remedial or other work to, the common property.
- The vendor should ensure the warranties and undertakings in clauses 7.0 and 8.0:
  - are able to be complied with; and if not
  - the applicable warranty is deleted from the agreement and any appropriate disclosure is made to the purchaser.
- Both parties should ensure the lists of items in Schedules 2 and 3 are accurate.
- Both parties should seek professional advice regarding the GST treatment of the transaction. This depends upon the GST information supplied by the parties and could change before settlement if that information changes.

THE ABOVE NOTES ARE NOT PART OF THIS AGREEMENT AND ARE NOT A COMPLETE LIST OF MATTERS WHICH ARE IMPORTANT IN CONSIDERING THE LEGAL CONSEQUENCES OF THIS AGREEMENT.

PROFESSIONAL ADVICE SHOULD BE SOUGHT REGARDING THE EFFECT AND CONSEQUENCES OF ANY AGREEMENT ENTERED INTO BETWEEN THE PARTIES.

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

DATE: Jul 10, 2020

VENDOR:
CDL Land New Zealand Limited
Contact Details:
C/- Natasha Hood/Simone Cromhout
Level 13, 280 Queen Street, Auckland
PO Box 3248, Shortland Street, Auckland 1140
Natasha Hood Ph: 09 353 5019 Fax: 09 353 5098
Simone Cromhout Ph: 09 353 5074

VENDOR'S LAWYERS:
Firm:
Individual Acting:
Email:
Contact Details:
Please refer to the Vendor using the above contact details.

Email Address for Service of Notices:
(subclause 1.4)
admin@cdli.co.nz

PURCHASER:
Lynley Bunn

Contact Details:
8 Havana Gardens, Shirley, CH CH 8052
M: 0274 901 323
E: lyn390@gmail.com

PURCHASER'S LAWYERS:
Firm: Bishopdale Law
Individual Acting: Angela Dunbar
Email: angela@bishopdalelaw.co.nz
Contact Details: PO Box 20031
Bishopdale
Christchurch 8543
P: 03 359 6679
F: 03 359 4434

Email Address for Service of Notices:
(subclause 1.4)

LICENSED REAL ESTATE AGENT:
Agent's Name: Professionals Christchurch Limited
Manager: Colin Lock
Salesperson: Colin Lock
Contact Details:
33 Halswell Road, Hoon Hay, Christchurch 8025
P: 03 338 5924 | F: 03 338 1480 | service@prof.co.nz

SPECS

LYN BUNN

LOT 460 HOFFMAN ST

CHRISTCHURCH

PRELIMINARY AND GENERAL

BUILDING CONTRACT:

The general conditions governing the contract shall be generally as set out by the Canterbury Masters Association and shall be prepared by the Contractor.

SPECIFICATION:

This specification shall be read in conjunction with the drawings and the contract and shall be taken to be a record of the materials used and the standard of workmanship expected from the Contractor and Sub-contractors.

Anything not specifically mentioned will be carried out to the New Zealand Standard Specification 3604 and New Zealand Building Code and NZS 4229 Concrete Masonry Buildings nor requiring specific design.

FOREMAN:

The Contractor is to have a competent foreman in charge of the contract from start to completion of work.

EXAMINE THE SITE:

The Contractor is advised to familiarise himself/herself with the site, specifications and drawings and to obtain generally their own information on all matters affection the execution of the works before submitting their quote.

The submission of a quote will be taken to mean that this has been done and that any matter that might affect the works has been taken into consideration and that allowance has been made accordingly. Any uncertainties shall be brought to the attention of the client.

BY-LAWS AND REGULATIONS:

All work and materials shall be in accordance with the requirements of the Building Regulations and with the New Zealand Building Code Handbook and approved documents and NZS 3604 Code of Practice for light timber frame buildings not requiring specific design. The contractor and subcontractors undertaking with work shall obtain copies of the relevant sections of the New Zealand Building Code and documents relating to acceptable solutions and verification methods and shall be conversant with their contents as these documents become part of each section of this specification.

Provision shall be made within the quotation of tender to comply with the by-laws and regulations of any authority, which relates to the works and to obtain all necessary permits to complete the work. The acquisition of the building Consent shall be the responsibility of the Client.

INSURANCE:

Before commencement of work the Contractor shall supply the Client with cover notes from the insurance company certifying that all the insurances required are covered by valid policies. The Contractor will be required to effect and maintain over the duration of this contract an insurance against loss or damage by fire to property, loss of life, accident, injury or damage to property arising out of, or caused or contributed to either directly or indirectly by the operation of the Contractor.

WORKMANSHIP:

All workmanship shall be in accordance with good trade practices and such that a good standard of end result will be obtained.

PROTECTION OF EXISTING BUILDINGS, PATHS, ETC:

Protect existing buildings, paths, driveways, services and roadways from damage due to contractual operations. Properly make good or repair any damage that may occur.

VARIATIONS:

No variations to the contract shall be made without the prior written permission of the client.

TEMPORARY POWER SUPPLY:

The Contractor will be responsible for arranging “Contractors Power Supply” connection on site and arranging all necessary fees to be paid.

PROVIDE PLANT:

Provide all plant, scaffolding, hoists, tackle etc and a foreman plus sufficient number of men for the proper expeditions and the complete execution of the works, supply and cartage, workmanship and materials, which although not specifically mentions, may be nevertheless incidentally necessary for the proper completion of the work described herein.

SETTING OUT:

The Contractor is to do the setting out of all work and is to be responsible for its accuracy and must amend any errors. Check all dimensions on the site in particular siting and set out of foundations before pouring any concrete. Any doubt in setting out shall be reported to the Designer.

ATTENDANCE:

Contractor shall ascertain from each sub-contractor all particulars relating to his work with regard to the order of its execution and the position in which chases, holes etc shall be required before the work is started. No claim shall be allowed for extra cost of cutting away work already executed in consequence of any neglect by the Contractor to ascertain these particulars before hand.

CLEANING AND PROTECTION:

The Contractor shall at frequent intervals and in any case whenever so required by the owner and at completion, remove from the building and site all rubbish litter and surplus materials which may accumulate and shall take all reasonable precaution to protect finished surfaces from damage or disfigurement of the finished work of other trades and will be responsible for the cost of restoring any surfaces harmfully affected. Particular care shall be taken by all trades to avoid scratching, denting or bruising finished or exposed joinery timbers. All paint or plaster splashes or other marks shall be removed and cleaned off immediately.

PURCHASE OF SPECIAL GOODS:

The Owner reserves the right to purchase all fittings etc for which P.C. prices or Lump Sums are specified. The P.C. Sums quoted shall be P.C prices in Christchurch and the Contractor shall be entitled only to the usual trade discount. Where Lump Sums are specified the amounts allowed are net and the Contractor must add his own profit to such sums specified as no discount will be allowed.

SHEDS AND STORAGE:

The Contractor shall supply ass necessary temporary sheds and toilet for the use of his men and for storage of materials on the site.

CARE OF WORKS:

The Contractor is to keep all persons on the works (including those employed by sub-contractors) under his control and within the boundaries of the works generally until their completion including all work executed and materials deposited on the site by himself or sub-contractors and suppliers. The Contractor shall be responsible for all damage arising from weather carelessness of the operatives, damage or loss and shall be held solely responsible for all damage to adjoining buildings or property caused by him or his employees including sub-contractors and shall indemnify the principal against all claims on account thereof.

PROTECTION FROM WEATHER:

The Contractor is to cover up and protect the works from the weather and is to suspend all operations during weather, which would be detrimental to the work.

COMPLETION:

At completion the Contractor shall remove all refuse and debris from and around the building and off the site. Leave the whole site tidy and fit for gardening and leave the entire buildings, including paths, steps, terraces etc ready for use. All floors shall be left broom clean, all glass work left sound and clean inside and out and all painted and stained or polished work left free from spots and dirt. All bench tops and basin, pans, etc shall be left clean and free from paint, varnish or other spots.

MAINTENANCE:

The Contractor shall make good all defects, shrinkage or other faults whatsoever which may arise or appear within a period of ninety (90) days after the certified completion of the works. Maintenance retention shall be 2.5% if the contract price and shall be retained until the completion of the 90 day maintenance period.

CERTIFICATES:

The Contractor shall obtain from the Territorial Authority, Network Utility Authority or Building Certifier all required certificates and approvals.

Where Producer Statements are required by the Territorial Authority prior to the issue of a Code Compliance Certificate, the Contractor shall obtain and deliver such required statements.

The Contractor shall uplift a Code Compliance Certificate (covering the whole of the building work) from the Territorial Authority or the Building Certifier as applicable prior to completion of the contract.

FOUNDATIONS/EXCAVATIONS

SETTING OUT:

The Contractor/Sub-Contractor shall be responsible for the accurate setting out of all construction work and services required to be executed under this contract.

EXCAVATIONS:

The Contractor/Sub-Contractor shall organise the removal of all vegetation etc until firm ground, free from organic matter, is reached. The actual ground level shall be measured and agreed to between the Contractor/Sub-Contractor and the Engineer prior to any work being carried out. Excavate for driveway and retaining walls. All excavations shall be maintained where necessary by planking and strutting to prevent the sides of trenches collapsing. In all excavations the Contractor/Sub-Contractor shall ensure that all trenches are kept free of water. If water intake should occur pumping or other means shall be taken to completely remove the water.

BACKFILLING:

All backfilling shall be placed and compacted in layers of 150mm max thickness and compacted by suitable powered mechanical compaction equipment and the ground excavated beyond the building line shall be backfilled to marry into the existing ground level.

SERVICES:

Allow for the excavation of all required service lines inside or under the building that are required to be buried in or under concrete or timber floors in collaboration with the various trades, before the construction and placing of any concrete, hard fill or timber floors.

FOUNDATIONS:

Foundations to be constructed as detailed on the drawings. Provide openings, chases, pockets etc in foundations for electric cables, telephone cables, water supply, waste pipes and sewer as required.

CONCRETOR

MATERIALS AND WORKMANSHIP

Concrete shall be manufactured and placed in accordance with the requirements of NZS 3604.

CONCRETE

Concrete shall be thoroughly and continuously compacted during placement by internal vibration so as to produce a dense uniform mass with the surface finish specified. Immersion or poker type vibrations shall be of suitable diameters and of sufficient number to ensure that at the required rate of placement of each part of the structure the entire volume of each layer of concrete is thoroughly vibrated and complete compaction is achieved. The minimum strength of concrete is as follows:

1. Foundations 20 Mpa
2. Floor Slabs 20 Mpa
3. Block work Grout 20 Mpa

BUILT-IN ITEMS:

Provide and build in to the concrete work all necessary anchors, holding down bolts, ties plugs etc for securing of other work to the concrete. Provide and build in all sleeves, pipes, wires, conduits and other requirements necessary for the provision of services to the building.

REINFORCING STEEL

MATERIALS AND WORKMANSHIP:

All reinforcing steel shall be Ductility Grade E steel. The bending, cleaning, placing and lapping of reinforcing steel shall be carried out in accordance with the appropriate standards, the best trade practises and as indicated on the drawings.

All Reinforcing steel to NZS 4671

PLACING AND COVER:

All reinforcing steel shall be placed and securely fixed in accordance with the drawings. Reinforcement shall be accurately supported by concrete or other approved chairs, spaces or ties. The use of bricks, stones or timber for the support of reinforcing steel is strictly forbidden.

CARPENTER

GENERAL:

All carpentry work is to be set out to the dimensions given and attend upon all other trades. All work shall comply with the N.Z.B.C and acceptable solutions and N.Z.S 3604

TIMBER:

All timber is to be the best of its respective kind, free from loose knots, shakes and other imperfections and to hold to the sizes specified.

KINDS OF TIMBER:

Timber shall be graded according to the NZS 3631 : "Classification and Grade of Timber." Framing timber shall be dry to 20% moisture content before being enclosed and finishing timber to 12%-18% moisture content. Structural timber shall be standard engineering grade.

FINISH:

Framing timbers shall be gauged. Timber exposed to view or touch, shall be machine dressed. Interior finishing's shall be with sandpaper. Remove all arises, rough or uneven patches, hammer marks and other surface defects before painting or other surface finishing.

WORKMANSHIP AND CONTRUCTION:

Workmanship and construction shall be of the best trade practice, and shall comply with the relevant provisions of N.Z.B.C and NZS 3604. The best trade practice shall be deemed to include those methods, practises and processes contained in the current syllabuses for the New Zealand Trade Certificates in Carpentry, Joinery and Timber machinery.

BUILDING PAPER:

Building paper shall be as noted on drawings. Torn or punctured sheets shall be rejected and must be replaced. Adjacent sheets shall have a minimum lap of 100mm. B2 durability. N.Z.B.C.

DAMPCOURSE:

A damp course of 3 ply bitumen fabric weighing not less than 3.66kg per sq metre shall be laid under all timbers in contact with concrete.

WALL FRAMING:

Framing is generally laserframe.

1. Plates – All plates shall be in long lengths laid flat and shall have dovetail halvings at all connecting points, corners and junctions.

2. Studs - All studs shall be cut to lengths as required, having square ends and shall be spaced to suit wall linings centres as shown on drawings. At all corners and junctions, sufficient studs shall be provided to give a 50mm bearing to a linings.

3. Dwangs - Dwangs shall be 90x45mm timber in rows spaced at a maximum of 800mm apart and securely nailed to studs with two nails at each end. Provide all extra dwangs required to support fittings and at all joints of lining sheets.

ROOF CONSTRUCTION:

a) **Trussed Roofs:** Drawings showing clearly the type, pitch, span, spacing and overhangs of roof trusses and details of roof claddings shall be provided to the truss manufacturer. Thereafter, the Contractor shall match construction with the drawings and details provided by the truss manufacturer throughout all stages of fixing and bracing. The Contractor shall especially accord with the manufacturer's instructions for tying down where over-hangs exceed 750mm. In all cases anchorage of all trusses to plates shall be with not less than 2/100mm skew nails plus 2/4.0mm wire dogs.

EAVES:

Construct boxed eaves (unless otherwise shown on plans) and fit timber fascia or leave ready for fixing of Stratco spouting and fascia or Taylor Fascia. Line underside of soffits (unless otherwise detailed) with 4mm flat hardieflex sheets.

METER RECESS:

Provide recess for Electric meter Board where directed to the satisfaction of the Local Electric Supply Authority.

MAN HOLE:

Provide manhole in ceiling 800 x 800mm where directed.

WARDROBES:

To be lined full height. Provide inside each with 300 x 25mm full width shelf at 1.7m from floor and 20mm galvanised pipe coat rail at 75mm below shelf. Provide cupboards over wardrobe where required.

LINEN:

Lined full height inside and to have 25mm helving. Full depth for linen at approximately 400mm c.c.

ARCHITRAVES, SKIRTINGS ETC:

Finish all windows internally, door openings and wherever required with 50 x 12mm rounded or splayed architraves. Finish at junction of floor and well with 75 x 12mm Rimu or Custom wood skirting neatly mitred at angels and scribed to floor. Supply and fix beads, half rounds where required.

INSTALLATION:

Install bath tub, shower cabinet/s, w.c., hand basin, vanity units and all other joinery as supplied by joiner.

SHOWERS:

Construct shower cabinet as shown on Plan, if not a one-piece unit. Fit shower floor (floors) and line walls with an approved wet area wall lining. Owner to choose colour.

SHOWER DOORS:

Supply and install sliding shower doors and screens where required, with clear safety glass.

GARAGE DOORS:

Supply and install Tilta or Roller door as shown on plan.

PRIMING TIMBERS:

Allow to Prime or Stain any exterior timbers where necessary before erection.

INSULATION:

Refer to NZBC Clause H.1 Install insulation as required in NZBC acceptable solution H1/ASI. All insulation materials are to be installed in accordance with manufacturers recommendations and the NZBC.

R3.6 – fibreglass batts to ceilings
R2.6 – fibreglass batts to exterior walls

BRICKLAYER

GENERAL:

All work is to be carried out by specialist tradesmen and in accordance with the requirements laid down in NZSS 3604 and NZS 4229 as appropriate and NZS 4210.

WORKMANSHIP:

Walls shall be erected true to line and plumb and be properly bonded and bedded in mortar.

Blocks and bricks shall be free from cracks and chips. Any concrete or mortar slit on walls shall be washed off before it can set. Any mortar slit on Aluminium doors or window frames is to be washed off immediately before it dries.

BOND:

Blocks shall be laid in stretcher or stack bond as shown. All joints shall be full and struck to provide a fair faced finish to both surfaces complete bond shall be secured between the blocks and mortar. Ensure that bond is not broken by making adjustments to blocks after mortar has taken a set.

MORTAR:

The mortar for all block work shall be composed and mixed according to the relevant NZS clauses; water shall be potable; sand shall comply to NZS 3109 for grout filing of masonry cavities and NZS 3103 “Sands for Mortar”, Plaster and External Renderings” for mortars. All mortar mixes shall have a minimum compressive strength of 12 Mpa at 28 days.

All cement shall comply with NZSS 3122 and shall be properly stored at the site and adequately protected from dampness.

JOINTS TO BLOCKWORK:

All block work joints shall be neatly tooled with a 10mm jointer to form a neat concave recess to a good line, level and of consistent depth of approximately 6mm.

WATERPROOFING:

The Contractor shall ensure all block work above and below ground prevents the entry of water into the inside of the building. The Contractor shall provide warranties and prices for waterproofing from a number of manufacturers of their approved applicators and the type and price for the work shall be agreed. Internal strapping and lining as necessary to comply with insulation stands shall not proceed until evidence that the block work is free from leakage is demonstrated.

WEEP HOLES:

Provide weep holes in concrete block work at least 50mm below all bottom plates and below finished ground level and above intermediate floor level, at approximately 800mm intervals. Dill or rake out weep holes to base of mortar bedding so as not to entrap any rain that might enter the walls.

MATERIALS:

Type of Brick:

a) Bricks for external veneers and foundation walls shall be of the colour and type selected and shall comply with Midland Brick specification. All fair face brickwork shall be laid with their best face outwards.

b) Cement shall be ordinary Portland cement and at the time of use shall comply with NZSS 3122 Portland Cement.

c) Plasticizers shall be used in accordance with the manufacturers instructions and no other additives are to be used in conjunction with these materials. On no account will further addition be made at the time of retempering mortars.

d) Water – water shall be portable.

e) Sand for Mortars – Sand used shall be Mercer No 1 sand and/or shall comply with the relevant clauses of NZSS 3103, Sand or Mortar, Plasters and External Renderings.

PREPARATION OF MORTAR:

Mortar shall be prepared by mixing in an approved mixer. Measurement of materials shall be by volume using suitable containers. Mortar shall be mixed until a homogenous mass is obtained but for not less than 5 minutes. All mortar whether on the boards or left in the mixer shall be used within 90 minutes. Mortar not used in this time shall be discarded.

BRICKLAYING:

Bricks shall be laid in stretcher bond true to line and level and plumb and in accordance with the best trade practice. All work shall be laid from the lowest corner and no corner shall be raised more than 900mm above wall line. Corners shall be racked back. On no account shall toothing be permitted. All joints will be completely filled with mortar and the bricks shall be disturbed as little as possible after initial positioning. Joints shall, unless otherwise specified, be not more than 9.5mm thick and shall be tooled as directed as work proceeds. Where tapestry bricks are used care shall be taken to use a tool slightly smaller than joint width to prevent pushing mortar into the brick striations.

MASONRY VENEER:

a) Building Paper:

Run Buiding Wrap horizontally and well secure to outside face of framing from bearer to top plate. Repair tears and holes before constructing Veneer.

b) Clay Brick Veneer:

I. Construct brick veneer with approved face fixed ties at correct spacings in accordance with E2/AS1 and with materials and workmanship to NZS 4210

II. A cavity of not less than 40mm and not more than 75mm shall be maintained between building paper and veneer. Where necessary weep holes shall be left every third joint for the discharge of water, as under Concrete Block layer. Keep the cavity and up stand clean, free from mortar protrusions and droppings. Keep pipes or electrical wire, junction boxes etc, out of the cavity. Thoroughly clean down the face of work on completion leave free of mortar stains and efflorescence.

c) Sills:

Sills to be brick on edge brought to underside of wooden sills or aluminium joinery. Junction between to be filled with a suitable sealant as recommended by the Joinery Manufacturer and over pointed with cement mortar.

ALUMINIUM JOINERY

GENERAL:

All window and door frames shall be built from selected powder coated aluminium sections/profiles. All aluminium to comply with NZS 4211 "Specification for Performance of Window" and NZS 3504 "Specifications for Aluminium Windows" and NZS4223 Parts 3: 2016 and to be to sizes shown on plans.

Windows to be fitted with H3.1 25mm Pine Reveals grooved to take Gibraltor Board and lockable double tongued latches to sashes. The colour of the aluminium frames shall be selected by Owner.

All glass shall comply with N.Z.S.4667 & 4223 Parts 3: 2016

Double glaze units as shown.

All windows & doors to be fitted with WANZ bars as per drawings & manufactures specifications

TIMBER JOINERY

GENERAL:

Refer to General Conditions of Contract, which shall apply to this section of work.

Supply all joinery as required and shown on the plans, including trim, pelmets, stairs etc.

All materials and fittings must be top quality and shall be supplied to the site pre-finished or ready for finishing as indicated.

The Joiner must discuss the joinery details with the main Contractor/Owner at the time of pricing to clarify any queries he may have and prior to manufacture if necessary.

The Joiner must site measure and verify all opening heights, for fitted joinery and confirm final appliances sizes and models, and tolerances required for all built-in fittings. Joiner shall liaise with the Main Contractor and Carpenter to allow all necessary tolerances, shadow margins etc to allow building in.

KITCHEN JOINERY:

Kitchen joinery to be built up as shown, for the supply of kitchen joinery including all bench tops, etc.

Joiner to liaise with Main Contractor/Owner to discuss final details before manufacture.

INTERIOR DOORS:

All interior doors to be 810mm paint grade/Rimu in ex 150 x 35mm Rimu DA back grooved for Gibraltor Board.

All other cupboard doors and front to be as shown on plan.

Aluminium wardrobe panels fitted into 150 x 35mm Rimu DA Reveals grooved for Gibraltor Board.

EXTERIOR DOOR:

Supply of main entry door to be hung in aluminium frame with sidelights or heart rimu timber frame with sidelights as shown on plan.

INTERIOR LININGS

WALLS:

Line all walls with 10.0 mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

OTHER LININGS:

CEILINGS:

Line ceilings with 13.0mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

GIB COVE:

PLASTER CORNICES:

ROOFER

TYPE OF ROOF:

Corrugated roofing at 25”

GENERAL:

The roofer shall co-operate with and co-ordinate their work with that of the Plumber in the provision of gutters brackets, flashing, downpipes, etc. All roofing and flashing shall be laid by tradesmen wearing soft footwear and experienced in this type of work. On completion of this part of the contract, all surplus materials, debris and rubbish shall be removed from the site and the roof shall be left in a thoroughly watertight and weatherproof condition.

Workmanship: All roofing materials shall be laid in strict accordance with the manufacture instructions and to NZS3604 & NZ Metal Roofing Manufactures Inc: NZ metal roofing & cladding code of practice

Guarantees: The Roofer is to provide all standard guarantees for the materials and workmanship as offered by the manufactures/suppliers of the roofing.

PLUMBER

ACCORDANCE WITH BY-LAWS:

All plumbing work to be in accordance with the Building Act, the Building Act and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the H.Z.B.C. Chapters B2, G10, G12, G13 and E1. All pipe materials are to be to AS/NZS 1260

CONSENTS AND FEES:

Arranged for and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials.

MATERIALS:

All materials to be of the best of their respective kinds and to approval before being used.

DOWNPIPES:

Where shown supply and fix DP as per plans. Downpipes secured with standoff brackets – 2 per downpipe. All downpipes shall be plumb and straight without offsets into spigots/sumps.

SPOUTING AND FASCIA:

Provide and fix type of spouting and metal fascia as shown on plans. All materials shall be laid in strict accordance with the manufacturers instructions. Colour to be selected.

FLASHINGS:

Liaise with the Carpenter to supply all flashings as required for the complete weatherproofing of the building and appurtenances. All flashings shall be shop formed and to approval.

ROOF FLASHINGS:

Flash all roof penetrations as necessary. Liaise with roofing contractors.

COLD WATER SUPPLY:

Bring in 20mm diameter cold water supply from lateral to house, provide meter and stopcock control/toby box as required by local Authorities. Provide taps at a suitable position to allow the complete system to be drained and shut down due to frost if not being used.

Pipe work shall be Polybutylene or similar to the approval of the Owners and shall be smooth full bore, seamless free from defects and suitable for the plumbing system. All pipe work shall be lagged to suit conditions.

HOT WATER SUPPLY:

Install Hot Water as shown on plans

All hot water piping shall be copper, generally 15mm diam. (20mm to bath_ shall be carefully formed with a smooth internal bore and shall be lagged and strapped tightly to the framing.

The hot and cold water supply lines to all fittings shall be taken off to give the best uninterrupted flows and pressures to fittings, e.g. showers first, then bath, basins, sinks, etc.

TRAPS AND WASTES:

Provide pvc wastes, pipes and raps to all fittings as required by regulation. Conceal all vents within wall space. Refer also to drawings. Wastes cast under slab shall be wrapped in "Denso" tape and plumbers felt.

All first floor back vents from fittings are to combine in ceiling space and connect in to soil stack vent before passing through roof.

TAPS, ETC:

Taps, mixers, shower rose, etc shall be covered by a P.C sum of $……..

SANITARY FITTINGS:

1. W.C Pans – Caroma Concorde Sovereign 2000 pans and cisterns. Colours to be selected.

2. Shower Trays – supply shower trays to sizes shown on plan. Colour to be selected.

3. Bath – supply bath/spa bath as shown on plan. Colours to be selected.

4. W.C. Hand basin – Caroma Valet Hand Rinse Basin. Colour to be selected.

5. Vanities: Allow for the supplying of vanity units.

6. Tub – Rotec Super Tub, complete with taps.

HOSE TAPS:

Supply and install two hose taps.

ADDITIONAL PLUMBING FOR FOLLOWING APPLIANCES AND INSTALLATION AS SUPPLIED BY OWNERS:

1. Dishwasher

ELECTRICIAN

GENERAL:

The electrical work shall be carried out in accordance with the NZECP 51, the Building Act, The New Zealand Building Code and Approved Documents, and to the complete satisfaction of their Inspector. All wiring shall be concealed.

CONNECTION TO MAINS:

Make all necessary connections to the Local Authority main, all wiring shall be underground within the site boundary.

Allow to provide temporary power to site for construction.

CONSENTS:

The Electrician shall obtain all Consents and pay all fees for the above work before commencing any work.

MATERIALS AND ARTICLES:

Except where specified otherwise, all materials and articles shall be of New Zealand Manufacture. All articles and materials not specified by makers catalogue number, shall be of the best quality.

WORKMANSHIP:

The whole of the work shall be carried out by skilled Tradesmen using adequate equipment and methods in accordance with best Trade practice.

FINISH:

Particular care shall be taken with this section of the work, as none but a high class finish shall be accepted.

SETTING OUT:

Where not specifically shown on the drawings or noted in the specification, the exact position of points and lights shall be determined on the job by the owner.

POINTS:

Allow for double outlets and single outlets as shown on plan

LIGHTS:

Allow for light points as shown on drawings. If light fittings are to be supplied allow a P.C. sum of $ ……. For the supply of fittings. If fittings supplied by owners, owners shall liaise with Main Contractor/Electrician for installation of fittings.

SHAVING POINTS:

Allow for shaving points to all vanities.

TELECOM, TELEVISION AND SECURITY WIRING:

Refer to Electrical plan.

BATHROOM HEATERS AND TOWEL RAILS:

Allow for and install heated towel rail to Bathroom and ensuite.

ADDITIONAL WIRING AND INSTALLATION OF FOLLOWING APPLIANCES AS SUPPLIED BY OWNERS:

1. Range hood as shown on plan
2. Dishwasher as shown on plan
3. Front Door Bell
4. Garage Door Opener (supplied with garage door)

DRAINLAYER

GENERAL:

All work shall comply with the Building Code, the Building Act, and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the N.Z.B.C. Chapters B2, G10, G12, G13 and E1.

The general Contractor is to collaborate with the Drainage Contractor and arrange with him for carrying out his work at such times and in such a manner as will cause the minimum amount of inconvenience and delay.

All stormwater and sewer pipes where possible are to be run in the same trench.

CONSENTS AND FEES:

The drain layer shall apply and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials. On completion, the whole of the drainage is to be tested and handed over to thorough working order, according to the requirements of the Local By-Laws and to the satisfaction of their Inspector. The Drain layer shall supply any necessary records of works carried out as required by the New Zealand Building Code.

CO-OPERATE WITH CONCRETOR/CARPENTER:

Co-operate with the Concretor for the forming of opening of foundations, pads, etc. Co-operate with Concretor in placing all necessary pipe work before concrete is placed.

PIPES:

All sewer and stormwater pipes shall be uPVC complying with NZS 7643

GULLY TRAPS:

All gully traps shall be uPVC with cast aluminium grates. Set gully trap in concrete haunched around pipe.

Surround gully dish with concrete 100mm above finished ground level properly boxed with a plaster finish.

LAYING OF DRAINS:

All drains shall be commenced at the point of outfall and worked back to the highest part with at least 500mm earth cover.

All branches and other connections, cleaning eyes etc to be connected in as work proceeds. All joints shall be made as per Manufactures instructions.

If cover is less than 500mm pipes shall be covered with concrete to the requirements of the Local Authority. Soil and stormwater pipes under slab shall be run in ABS pvx.

SEWER MAIN:

Excavate and lay drain to connect into existing sewer Lateral as indicated on drawings to the approval of the Local Authorities.

STORMWATER MAIN:

Excavate and lay stormwater disposal system to discharge into side channel as indicated on drawings to the approval of the Local Authorities.

DOWNPIPE SUMPS:

Form downpipe sumps using 100mm dia. uPvc riser set into concrete surround haunched around pipe.

Surround riser with concrete properly boxed 100mm above finished ground level with a plaster finish and cast aluminium grate.

GAS

GENERAL:

All work shall comply with the Building Code, the Building Act, and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the N.Z.B.C. G10, G11, G12, and NZSD5601.1 Appendix J

The general Contractor is to collaborate with the Gas Contractor and arrange with him for carrying out his work at such times and in such a manner as will cause the minimum amount of inconvenience and delay

CONSENTS AND FEES:

Arranged for and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials.

MATERIALS:

All materials to be of the best of their respective kinds and to approval before being used.

WORKMANSHIP:

The whole of the work shall be carried out by skilled Tradesmen using adequate equipment and methods in accordance with best Trade practice.

FINISH:

Particular care shall be taken with this section of the work, as none but a high class finish shall be accepted.

SETTING OUT:

Where not specifically shown on the drawings or noted in the specification, the exact position of points and lights shall be determined on the job by the owner.

PLASTERER

GENERAL:

All work shall be carried out by suitably qualified and competent tradesmen who shall supply all materials, plant and equipment necessary to complete the works.

All work shall comply with the NZS 4251 “Code of Practice for Solid Plastering”.

SCOPE:

Allow to plaster area as shown on plan. Plaster finish to be discussed with Owners.

Allow to smooth plaster exposed surfaces of foundations.

PAINTING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC 1992:B2, E2, G7

Scope:

Soffits
Exterior cladding
Front door & sidelights
Interior walls & ceilings
Interior doors & window reveals
Skirtings & trims

Materials:

Dulux Tradeline in unopened containers.

External:

1 undercoat, 2 top coats acrylic high gloss or stain or oil as selected

Internal:

All Gibraltor board shall have sealer applied over No. 4 stopping finish, all in accordance with the Gib Board Manufacturer's specification.

1 coat Gib sealer or 1 undercoat, 2 top coats acrylic semi gloss or high gloss as selected.3 coats polyurethane for clear finish

GIB Aqualine to all wet area with 2 Coat Enamel

Colours:

All colours to be as selected and approved by Owner (maximum of 4 colours from white base)

Application:

Thoroughly prepare all surfaces, rub down between coats and leave a first class finish. Stop all cracks and nail holes, etc. No painting shall be done under adverse weather conditions. All paintwork shall be 3 coats in 1 undercoat and 2 top coats.

All work shall be of the highest standard, performed by skilled tradesmen in accordance with best trade practice, using tools and equipment suitable for ensuring a first class job.
No external work shall be done during frosty or inclement weather.
Any work damaged by dust, rain or any other cause shall be rubbed down and recoated. The top and bottom edges of all doors etc. shall be painted to the same number of coats as the exposed faces.

No coat of paint, varnish or polish shall be applied until the undercoat is perfectly dry and hard. All finished surfaces shall be left smooth, even and free from brush marks, lap marks, corner dribbles or other trades.

All fittings, fixings and hardware shall be removed before preparatory processes are commenced and shall be refixed on completion of the painting. Adequately protect all finished work, including glass from paint splashes.

On completion, clean down all surfaces involved, including glass, rubbish, splashes and blemishes, etc. Remove all rubbish and leave ready for occupation.

TILING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Scope:

This section of work includes supplying, laying, grouting and sealing of tiles to as shown on Floor Plan and in conjunction with Client

Laying:

Tiling shall be carried out following the guidelines and practices described in the BRANZ publication: Good Tiling Practice

Set out is to be confirmed at the time of selecting tiles and before work is commenced. Tiles shall be fixed straight and even with no ridges. Cracked or chipped tiles shall not be used. Where required tiles shall be cut using a saw to produce straight edges with no chips or cracks. Cut tiles shall be laid with cut edges concealed from view.

Joints to tiles shall be finished smooth and be sealed against moisture. Seal bottom edge of tiles at benches with selected colour-matched silicone type sealant. Sealant to be fungus resistant. Grouting of tiles to be sealed once dry to stop moisture penetration inwards.

Interior tiles shall be laid over Gib Aqualine

Guarantees:

The tiles shall provide a Guarantee to cover against defective workmanship and materials supplied by him for a period of not less than 2 years after Certified Practical Completion.

TRUSS

Precut Construction Limited

PHONE: (03) 3237687
FAX: (03) 3238103
EMAIL: sales@precut.co.nz

Pre-Consent Sheet

Date:	**09/09/2020**	Job Ref#:	**PC20232**
Client:	**Lara van Drongelen**		
Job Address:	**Lot 460, Hoffman Street, Prestons Park**		
Building Consent Number:	**TBC**		
To Be Provided By:	**Christchurch District Council**		

We have been engaged to provide the Trusses and/or Framing for the above project.
To allow completion of the consent application we have supplied the following information:

(a) Consent Sheet
(b) Truss Layout
(c) Producer Statement
(d) Truss Fixings Report as per Mitek version 20/20 4.7
(e) Slab Thickenings for Point Loads - Not required
(f) Beam Design Layout as per Mitek SAPPHIRE version 8.3.1
(g) Beam Producer Statement as per Mitek SAPPHIRE version 8.3.1 & Spanman Beam Design Systems.

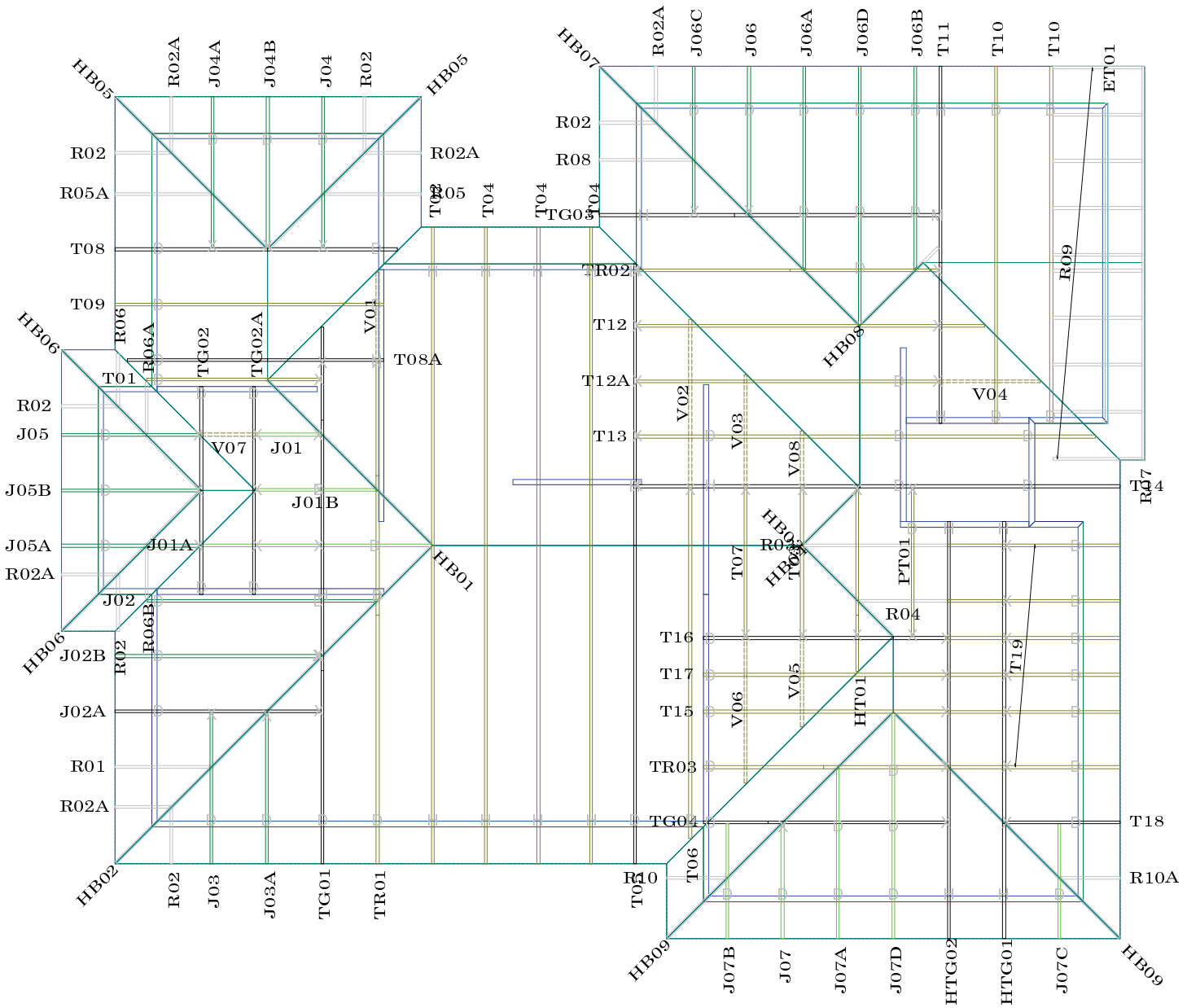
On advice from the building project owner, the structure will be designed under the following parameters:

Wind Zone:	**High @ 44.0m/s**	Snow Zone:	**0.9 kPa @ 100m**
Earthquake Zone:	**2**	Roof Materials:	**Longrun Iron**
External Framing :	**90*45 Sg8 H1.2**		
Internal Framing:	**90*45 Sg8 H1.2**		
Roof trusses:	**90*45 Sg8 H1.2**		

We can advise the following will be provided at the time of manufacture to both the building owner and your office.

1. A full ‘as built’ layout and producer statement .
2. Specific Truss Fixings as per Mitek version 20/20 4.7.
3. Specific stud to top plate fixings to comply with NZS3604:2011
4. Specific lintel fixings to comply NZS3604:2011
5. Beam Designs as per Mitek version 20/20 4.7
6. Producer Statement for any beams outside NZS3604:2011

Our company requires acknowledgement of this letter , along with the building consent number , as soon as possible.



Precut Construction

9 Empire Road
Belfast
Christchurch
New Zealand
Telephone:
Fax:

Lara van Drongelen
Hoffman Street
Prestons Pard
Christchurch

Job: PC20232

Building Consent No.:

Scale: 1 : 100 | Date: 31/08/2020 | Drawn By: Rebecca Mck

Job Details:

Snow Zone:	Christchurch (N4)	Snow Altitude:	100 m
Wind Area:	High	Design Wind Speed:	44.0 m/s
TC Restraints:	900 mm	BC Restraints:	600 mm
Roof Material:	Galv Iron 0.55mm	Ceiling Material:	Standard Plaster Board 13mm
Roof Live Load:	0.250 kPa	Snow Load:	0.441 kPa
Roof Pitch:	25.000 deg	Truss Centres:	900 mm

MiTek New Zealand Limited

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.miteknz.co.nz

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **Precut Construction**

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 **PC20232** 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: Wednesday, 9 September 2020**

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

Job: PC20232 Client: Lara van Drongelen Site:
Phone: Hoffman Street
Description: Prestons Pard
Building Consent No.: Christchurch Phone:
MiTek 20/20 Engineering 4.7.301.0 MiTek New Zealand Limited Printed: 13:23:36 09 Sep 2020

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Precut Construction**, 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

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	Truss Timber	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron 0.55mm	Material:	Standard Plaster Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.220 kPa	Dead Load:	0.210 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 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, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	5220	25.000	900	J06C	1	1812	25.000	900	T08	1	3780	25.000	900
*HB01	1	3774	18.249	900	J06D	1	1812	25.000	900	T08A	1	3780	25.000	900
*HB02	1	7242	18.249	900	J07	1	1267	25.000	900	T09	1	3780	25.000	900
*HB03	1	2023	18.249	900	J07A	1	1267	25.000	900	T10	2	5220	25.000	900
*HB04	1	1252	18.249	900	J07B	1	1267	25.000	900	T11	1	5220	25.000	900
*HB05	2	3445	18.249	900	J07C	1	1267	25.000	900	T12	1	4925	25.000	900
*HB06	2	3162	18.249	900	J07D	1	1267	25.000	900	T12A	1	4925	25.000	900
*HB07	1	5912	18.249	900	PT01	1	2424	0.000	900	T13	1	7260	25.000	900
*HB08	1	1748	18.249	900	*R01	1	1565	25.000	900	T14	1	7270	25.000	900
*HB09	2	5142	18.249	900	*R02	6	913	25.000	900	T15	1	3968	25.000	900
HT01	1	2424	25.000	900	*R02A	5	913	25.000	900	T16	1	3968	25.000	900
HTG01	1	6180	25.000	900 LB	*R03	1	2341	25.000	900	T17	1	3968	25.000	599
HTG02	1	6180	25.000	900	*R04	1	1453	25.000	900	T18	1	1267	-25.000	900
J01	1	1062	25.000	900	*R05	1	1580	25.000	900	T19	6	1267	-25.000	900
J01A	1	1062	25.000	900	*R05A	1	1580	25.000	900	TG01	1	7568	25.000	900
J01B	1	1062	25.000	900	*R06	1	848	25.000	900	TG02	1	3380	25.000	900
J02	1	2752	25.000	900	*R06A	1	848	25.000	900	TG02A	1	3380	25.000	900
J02A	1	2752	25.000	900	*R06B	1	848	25.000	900	TG03	1	4925	25.000	900
J02B	1	2752	25.000	900	*R07	1	6420	25.000	900	TG04	1	3968	25.000	900
J03	1	1852	25.000	900	*R08	1	1525	25.000	900	TR01	1	7568	25.000	900
J03A	1	1852	25.000	900	*R09	10	1455	0.000	765	TR02	1	4925	25.000	900
J04	1	1867	25.000	900	*R10	1	980	25.000	900	TR03	1	3968	25.000	900
J04A	1	1867	25.000	900	*R10A	1	980	25.000	900	V01	1	1454	25.000	900
J04B	1	1867	25.000	900	T01	1	2752	25.000	900	V02	1	2735	25.000	900
J05	1	1667	25.000	900	T02	1	9150	25.000	900	V03	1	1835	25.000	900
J05A	1	1667	25.000	900	T03	1	2424	25.000	900	V04	1	1638	25.000	900
J05B	1	1667	25.000	900	T04	3	9150	25.000	857	V05	1	1463	25.000	900
J06	1	1812	25.000	900	T05	1	9150	25.000	857	V06	1	2380	25.000	900
J06A	1	1812	25.000	900	T06	1	5515	25.000	857	V07	1	883	25.000	900
J06B	1	1812	25.000	900	T07	1	2424	25.000	857	V08	1	918	25.000	900

Total quantity : 119

The computer design input has been carried out by:

Signed: ..... Date: ...Wednesday, 9 September 2020....

Name of Detailer: ..... Qualifications and Title:

On behalf of: Precut Construction
Ph: 03 323 7687

Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street
Prestons Pard
Christchurch
Phone:
Description:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0
MiTek New Zealand Limited
Printed: 13:23:54 09 Sep 2020

TRUSS FIXING SELECTION REPORT - Characteristic Loads

Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data)

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected	
ET01	1	5220	A			Wide		No fixing selected	
*HB01	1	3774							Refer NZS3604:2011 Tables 15.6
*HB02	1	7242							Refer NZS3604:2011 Tables 15.6
*HB03	1	2023							Refer NZS3604:2011 Tables 15.6
*HB04	1	1252							Refer NZS3604:2011 Tables 15.6
*HB05	2	3445							Refer NZS3604:2011 Tables 15.6
*HB06	2	3162							Refer NZS3604:2011 Tables 15.6
*HB07	1	5912							Refer NZS3604:2011 Tables 15.6
*HB08	1	1748							Refer NZS3604:2011 Tables 15.6
*HB09	2	5142							Refer NZS3604:2011 Tables 15.6
HT01	1	2424	F	2.839	1.698	Butt	1	JH 47x90	
			H	2.705	0.687	Butt	1	JH 47x90	
HTG01	1	6180	B	9.944	5.120	Cross	1	CT400	
			L	12.204	6.499	Cross	1	CT400	
HTG02	1	6180	B	14.495	8.604	Cross	1	CT400	
			M	13.863	7.966	Cross	1	CT400	
J01	1	1062	C	0.981	0.000	Butt	1	JH 47x90	
			D	0.380	0.458	Butt	1	Pair of 3.15d Nails	
			B	0.815	0.556	Butt	1	JH 47x90	
J01A	1	1062	G	3.224	0.098	Butt	1	JH 47x90	
			H	1.119	2.578	Butt	1	JH 47x90	
			F	0.533	0.389	Butt	1	Pair of 3.15d Nails	
			E	1.985	1.204	Cross	1	Pair of Wire Dog Staples	
J01B	1	1062	D	0.875	0.000	Butt	1	JH 47x90	
			E	0.273	0.842	Butt	1	JH 47x90	
			C	0.558	0.382	Butt	1	Pair of 3.15d Nails	
			B	2.105	1.434	Cross	1	Pair of Wire Dog Staples	
J02	1	2752	A	2.809	0.727	Cross	1	Pair of Wire Dog Staples	
			E	0.532	0.370	Butt	1	Pair of 3.15d Nails	
			D	3.928	2.405	Cross	1	Pair of Wire Dog Staples	
J02A	1	2752	B	4.658	1.840	Cross	1	Pair of Wire Dog Staples	
			F	2.757	1.761	Butt	1	JH 47x90	
J02B	1	2752	B	4.037	1.054	Cross	1	Pair of Wire Dog Staples	
			F	1.897	1.137	Butt	1	JH 47x90	
			D	0.870	0.552	Butt	1	JH 47x90	
J03	1	1852	B	2.867	0.844	Cross	1	Pair of Wire Dog Staples	
			E	0.999	0.599	Butt	1	JH 47x90	
J03A	1	1852	B	3.150	0.733	Cross	1	Pair of Wire Dog Staples	
			D	0.560	0.045	Butt	1	Pair of 3.15d Nails	
			C	1.441	1.084	Butt	1	JH 47x90	
J04	1	1867	B	2.883	0.850	Cross	1	Pair of Wire Dog Staples	
			E	1.011	0.608	Butt	1	JH 47x90	
J04A	1	1867	B	2.883	0.850	Cross	1	Pair of Wire Dog Staples	
			E	1.011	0.608	Butt	1	JH 47x90	
J04B	1	1867	B	3.164	0.738	Cross	1	Pair of Wire Dog Staples	
			C	1.786	1.138	Butt	1	JH 47x90	
J05	1	1667	B	2.660	0.779	Cross	1	Pair of Wire Dog Staples	
			E	0.846	0.483	Butt	1	JH 47x90	
J05A	1	1667	B	2.660	0.779	Cross	1	Pair of Wire Dog Staples	
			E	0.846	0.483	Butt	1	JH 47x90	
J05B	1	1667	B	2.975	0.668	Cross	1	Pair of Wire Dog Staples	
			C	1.557	1.013	Butt	1	JH 47x90	
J06	1	1812	B	3.112	0.719	Cross	1	Pair of Wire Dog Staples	
			D	0.548	0.044	Butt	1	Pair of 3.15d Nails	
			C	1.402	1.059	Butt	1	JH 47x90	
J06A	1	1812	B	2.875	0.301	Cross	1	Pair of Wire Dog Staples	
			D	0.424	0.513	Butt	1	Pair of 3.15d Nails	
			C	3.210	2.225	Cross	1	Pair of Wire Dog Staples	
J06B	1	1812	B	2.875	0.301	Cross	1	Pair of Wire Dog Staples	
			D	0.424	0.512	Butt	1	Pair of 3.15d Nails	
			C	3.210	2.225	Cross	1	Pair of Wire Dog Staples	
J06C	1	1812	B	2.822	0.830	Cross	1	Pair of Wire Dog Staples	
			E	0.967	0.574	Butt	1	JH 47x90	
J06D	1	1812	B	2.825	0.030	Cross	1	Pair of Wire Dog Staples	
			F	0.638	0.455	Butt	1	Pair of 3.15d Nails	
			C	3.035	2.122	Cross	1	Pair of Wire Dog Staples	
			E	1.442	1.091	Cross	1	Pair of Wire Dog Staples	
J07	1	1267	B	2.591	0.518	Cross	1	Pair of Wire Dog Staples	
			D	0.376	0.030	Butt	1	Pair of 3.15d Nails	
			C	0.820	0.710	Butt	1	JH 47x90	
J07A	1	1267	B	2.497	0.189	Cross	1	Pair of Wire Dog Staples	
			E	0.376	0.030	Butt	1	Pair of 3.15d Nails	
			D	0.484	0.278	Butt	1	Pair of 3.15d Nails	
			C	1.994	1.615	Cross	1	Pair of Wire Dog Staples	
J07B	1	1267	B	2.412	0.620	Cross	1	Pair of Wire Dog Staples	
			D	0.583	0.227	Butt	1	Pair of 3.15d Nails	

Precut Construction

Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street, Prestons Pard, Christchurch
Phone:
Description:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0
MiTek New Zealand Limited
Printed: 13:23:54 09 Sep 2020

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J07C	1	1267	B	2.412	0.620	Cross	1	Pair of Wire Dog Staples
			D	0.583	0.227	Butt	1	Pair of 3.15d Nails
J07D	1	1267	B	2.492	0.000	Cross	1	Pair of Wire Dog Staples
			F	0.376	0.030	Butt	1	Pair of 3.15d Nails
			E	0.587	0.418	Butt	1	Pair of 3.15d Nails
			C	1.838	1.520	Cross	1	Pair of Wire Dog Staples
			D	1.690	1.060	Cross	1	Pair of Wire Dog Staples
PT01	1	2424	D	1.870	0.805	Butt	1	JH 47x90
			F	0.845	0.740	Butt	1	JH 47x90
			E	2.476	1.271	Cross	1	Pair of Wire Dog Staples
*R01	1	1565						Refer NZS3604:2011 Tables 15.6
*R02	6	913						Refer NZS3604:2011 Tables 15.6
*R02A	5	913						Refer NZS3604:2011 Tables 15.6
*R03	1	2341						Refer NZS3604:2011 Tables 15.6
*R04	1	1453						Refer NZS3604:2011 Tables 15.6
*R05	1	1580						Refer NZS3604:2011 Tables 15.6
*R05A	1	1580						Refer NZS3604:2011 Tables 15.6
*R06	1	848						Refer NZS3604:2011 Tables 15.6
*R06A	1	848						Refer NZS3604:2011 Tables 15.6
*R06B	1	848						Refer NZS3604:2011 Tables 15.6
*R07	1	6420						Refer NZS3604:2011 Tables 15.6
*R08	1	1525						Refer NZS3604:2011 Tables 15.6
*R09	10	1455						Refer NZS3604:2011 Tables 15.6
*R10	1	980						Refer NZS3604:2011 Tables 15.6
*R10A	1	980						Refer NZS3604:2011 Tables 15.6
T01	1	2752	B	2.498	1.194	Cross	1	Pair of Wire Dog Staples
			F	2.288	1.398	Butt	1	JH 47x90
T02	1	9150	B	8.542	4.528	Cross	1	CT400
			J	8.542	4.528	Cross	1	CT400
T03	1	2424	D	2.067	1.694	Butt	1	JH 47x90
			F	2.658	0.301	Butt	1	JH 47x90
T04	3	9150	B	8.135	4.312	Cross	3	CT400
			J	8.135	4.312	Cross	3	CT400
T05	1	9150	A	8.486	4.269	Cross	1	CT400
			O	15.023	9.152	Cross	1	CT400
			K	3.237	1.923	Cross	1	Pair of Wire Dog Staples
T06	1	5515	H	4.340	2.864	Butt	1	JH 47x90
			F	4.860	2.293	Cross	1	Pair of Wire Dog Staples
T07	1	2424	D	1.930	1.798	Butt	1	JH 47x90
			F	2.479	0.156	Butt	1	JH 47x90
T08	1	3780	B	4.603	2.802	Cross	1	Pair of Wire Dog Staples
			F	5.239	2.846	Cross	1	Pair of Wire Dog Staples
T08A	1	3780	A	10.089	6.425	Cross	1	CT400
			E	5.001	2.785	Cross	1	Pair of Wire Dog Staples
T09	1	3780	A	3.126	1.843	Cross	1	Pair of Wire Dog Staples
			C	4.079	1.906	Cross	1	Pair of Wire Dog Staples
T10	2	5220	A	4.358	2.550	Cross	2	Pair of Wire Dog Staples
			E	5.274	2.609	Cross	2	Pair of Wire Dog Staples
T11	1	5220	A	14.655	8.773	Cross	1	CT400
			G	13.957	7.987	Cross	1	CT400
T12	1	4925	A	4.190	2.285	Butt	1	JH 47x90
			G	5.152	2.597	Butt	1	JH 47x90
T12A	1	4925	A	4.198	2.252	Butt	1	JH 47x90
			G	3.614	2.432	Butt	1	JH 47x90
			F	0.892	0.138	Cross	1	Pair of Wire Dog Staples
T13	1	7260	H	5.965	2.263	Cross	1	Pair of Wire Dog Staples
			N	5.407	2.219	Cross	1	Pair of Wire Dog Staples
			K	1.266	0.558	Cross	1	Pair of Wire Dog Staples
T14	1	7270	A	2.805	1.678	Butt	1	JH 47x90
			R	7.220	2.375	Cross	1	Pair of Wire Dog Staples
			J	9.262	5.291	Cross	1	CT400
			O	2.932	1.441	Cross	1	Pair of Wire Dog Staples
T15	1	3968	A	3.451	1.785	Cross	1	Pair of Wire Dog Staples
			F	3.288	2.100	Butt	1	JH 47x90
T16	1	3968	A	6.652	2.863	Cross	1	Pair of Wire Dog Staples
			G	6.476	4.070	Butt	1	JH 47x90
T17	1	3968	A	2.297	1.188	Cross	1	Pair of Wire Dog Staples
			F	2.188	1.398	Butt	1	JH 47x90
T18	1	1267	D	1.303	0.529	Butt	1	JH 47x90
			B	2.623	0.832	Cross	1	Pair of Wire Dog Staples
T19	6	1267	E	2.405	1.361	Butt	6	JH 47x90
			A	0.783	0.396	Butt	6	Pair of 3.15d Nails
			C	2.486	0.539	Cross	6	Pair of Wire Dog Staples
TG01	1	7568	M	4.668	3.262	Butt	1	JH 47x90
			R	15.570	11.896	Cross	1	CT400
			F	5.118	2.424	Cross	1	Pair of Wire Dog Staples
TG02	1	3380	A	3.721	2.408	Cross	1	Pair of Wire Dog Staples
			E	3.721	2.408	Cross	1	Pair of Wire Dog Staples
TG02A	1	3380	A	3.293	0.712	Cross	1	Pair of Wire Dog Staples
			E	4.180	0.766	Cross	1	Pair of Wire Dog Staples
TG03	1	4925	B	7.549	4.324	Cross	1	CT400
			I	9.038	5.820	Butt	1	Pair of MultiGrips
TG04	1	3968	A	4.065	2.799	Cross	1	Pair of Wire Dog Staples
			G	4.588	3.069	Butt	1	JH 47x90
TR01	1	7568	I	4.934	2.972	Butt	1	JH 47x90
			G	5.725	2.957	Cross	1	Pair of Wire Dog Staples
			M	3.011	1.531	Cross	1	Pair of Wire Dog Staples

Precut Construction

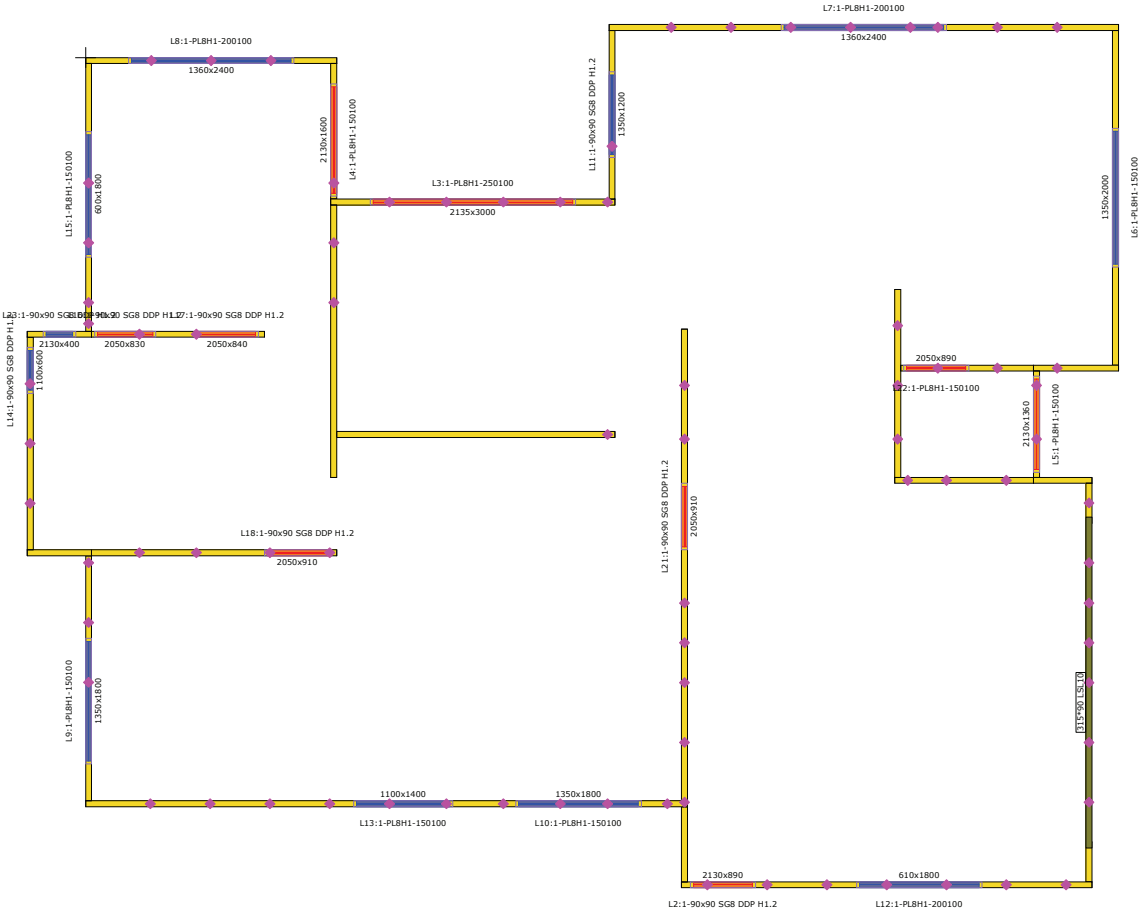
Job: PC20232
Client: Lara van Drongelen
Phone:
Site: Hoffman Street
Prestons Pard
Christchurch
Phone:
Description:
Building Consent No.:

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	---------- Fixing ---------- Qty	Selected
TR02	1	4925	A	4.159	2.269	Butt	1	JH 47x90
			J	4.076	2.555	Butt	1	JH 47x90
TR03	1	3968	A	3.346	1.818	Cross	1	Pair of Wire Dog Staples
			F	3.347	2.067	Butt	1	JH 47x90
V01	1	1454	A			Wide		No fixing selected
V02	1	2735	A			Wide		No fixing selected
V03	1	1835	A			Wide		No fixing selected
V04	1	1638	A			Wide		No fixing selected
V05	1	1463	A			Wide		No fixing selected
V06	1	2380	A			Wide		No fixing selected
V07	1	883	A			Wide		No fixing selected
V08	1	918	A			Wide		No fixing selected

Fixing List

Qty	Selected Fixing
51	JH 47x90
20	CT400
22	Pair of 3.15d Nails
69	Pair of Wire Dog Staples
1	Pair of MultiGrips
9	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.



PRECUT CONSTRUCTION LTD
Framing & Trusses Specialists

9 Empire Road
Belfast
Christchurch
New Zealand

Phone: (03) 323 7687

Sheet Tittle: **Framing Layout for Building Consent**

OT No.: **PC20232-Q-01** | Name:

Address: Hoffman Street , Prestons Park
Christchurch

Wind Area: High | Design Wind Speed: 44.0 m/s

MiTek SAPPHIRE™ Ver. 8.4.1
Better Technology. Better Building.

Building Consent No.:
Drawn By:
Structure: PC20232-ST-01
Date: 9/09/2020

Precut Construction

Client: Lara van Drongelen
Phone:

Site:
Hoffman Street
Prestons Park
Christchurch

MiTek SAPPHIRE™ 8.4.1.207.Update3 Printed: 13:29:40 09-09-2020

LINTEL SUMMARY

This Lintel Summary is issued by MiTek accredited fabricator Precut Construction being licensed to use the MiTek SAPPHIRE™ software, and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

Design Parameters

The MiTek SAPPHIRE™ design for this job is based on the following design parameters entered into the program. The Detailer/Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek SAPPHIRE™ lintels.

Job Details

Importance Level : 2 **Design Working Life :** 50 years

Details :
Roof Pitch : 20.000 °
Ceiling Pitch : 0.000 °
Overhang : 0 mm
Truss Spacing : 0 mm

Loading :
Roof : Galv Iron 0.55mm 0.19 kPa
Ceiling : Standard Plaster Board 10mm 0.16 kPa
Wind : High 44.0 m/s **Cpe :** Varies **Cpi :** Varies
Snow : N4 (Sub-Alpine) at 100.000 m
Open Ground Snow (Sg) : 0.900 kPa

Lintel Schedule

Label	Span (mm)	Size	Opening (HxW)	Panel	Level	Design Status
L8:1-PL8H1-200100	2490	1/PL8H1-200100	1360x2400	E1	Ground Floor	Designed
L4:1-PL8H1-150100	1690	1/PL8H1-150100	2130x1600	E2	Ground Floor	Designed
L3:1-PL8H1-250100	3090	1/PL8H1-250100	2135x3000	E3	Ground Floor	Designed
L11:1-90x90 SG8 DDP H1.2	1290	1/90x90 SG8 DDP H1.2	1350x1200	E4	Ground Floor	Designed
L7:1-PL8H1-200100	2490	1/PL8H1-200100	1360x2400	E5	Ground Floor	Designed
L6:1-PL8H1-150100	2090	1/PL8H1-150100	1350x2000	E6	Ground Floor	Designed
L5:1-PL8H1-150100	1450	1/PL8H1-150100	2130x1360	E8	Ground Floor	Designed
L2:1-90x90 SG8 DDP H1.2	980	1/90x90 SG8 DDP H1.2	2130x890	E12	Ground Floor	Designed
L12:1-PL8H1-200100	1890	1/PL8H1-200100	610x1800	E12	Ground Floor	Designed
L10:1-PL8H1-150100	1890	1/PL8H1-150100	1350x1800	E14	Ground Floor	Designed
L13:1-PL8H1-150100	1490	1/PL8H1-150100	1100x1400	E14	Ground Floor	Designed
L9:1-PL8H1-150100	1890	1/PL8H1-150100	1350x1800	E15	Ground Floor	Designed
L14:1-90x90 SG8 DDP H1.2	690	1/90x90 SG8 DDP H1.2	1100x600	E17	Ground Floor	Designed
L23:1-90x90 SG8 DDP H1.2	490	1/90x90 SG8 DDP H1.2	2130x400	E18	Ground Floor	Designed
L15:1-PL8H1-150100	1890	1/PL8H1-150100	600x1800	E19	Ground Floor	Designed
L16:1-90x90 SG8 DDP H1.2	920	1/90x90 SG8 DDP H1.2	2050x830	P17	Ground Floor	Designed
L17:1-90x90 SG8 DDP H1.2	930	1/90x90 SG8 DDP H1.2	2050x840	P17	Ground Floor	Designed
L18:1-90x90 SG8 DDP H1.2	1000	1/90x90 SG8 DDP H1.2	2050x910	P18	Ground Floor	Designed
L21:1-90x90 SG8 DDP H1.2	1000	1/90x90 SG8 DDP H1.2	2050x910	P21	Ground Floor	Designed
L22:1-PL8H1-150100	980	1/PL8H1-150100	2050x890	P24	Ground Floor	Designed

Total Quantity: 20

The lintel design input has been carried out by:

Signed: Date: Wednesday, 9 September 2020

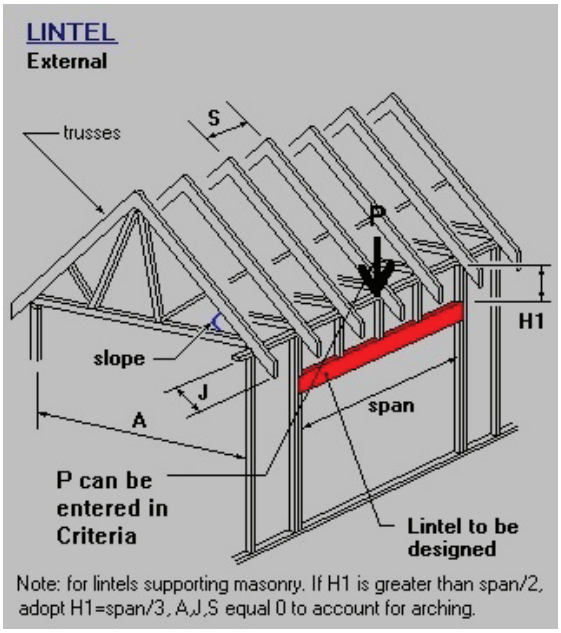
Date: 31/8/20 10:37 AM
Designed By: Precut Construction
Designer: Rebecca McKenzie
Email: sales@precut.co.nz
9 Empire Road
Kainga, Canterbury, 7644, New Zealand

Member: Garage Beam
Project: Lara vanDrongelen
Project Number: PC20232
Project Address: Haffman Street, Prestons Park

SPANMAN DESIGN CERTIFICATE

LumberworX ENGINEERED WOOD PRODUCTS SOFTWARE RELEASE 22.05.2017	9 Hickory Pl Islington, Christchurch 8042 New Zealand Certificate valid only if product sourced from Lumberworx

Single Span 315 deep x 90 wide Laminated Strand Lumber E10



This certificate may be submitted to a Building Consent Authority with an application for a Building Consent.Installation can only occur when a Building Consent has been issued by the relevant Building Consent Authority.
Country: New Zealand
Building type: House - domestic dwelling
Design working life: 50 years
Building Type Importance: 2 - Normal structures and structures not falling into other levels
Roof Use: Normal roof
Roof live load: 0.25 kPa, Roof live load: 1.1 kN

Wind region is High (44m/s ultimate)
V_{des}(serviceability) = 35 m/s
V_{des}(ultimate) = 44 m/s

Span = 4,800 mm
A = 1,312 mm (roof span)
J = 600 mm (roof overhang)
H1 = 0 mm (lower wall height)
E = 0 mm (floor span)
K = 0 mm (floor overhang)
S = 900 mm (truss/rafter spacing)

Roof weight(0.50 mm steel sheet) = 5 kg/m^2
Roof ceiling(10 mm plaster, pink batt insulation, wiring + sisalation + fittings) = 14 kg/m^2
Roof self weight(trusses/rafters) = 9.1 kg/m^2
H1 weight(NZS 3604 Light wall cladding (e.g. weatherboards)) = 40 kg/m^2

Snow Load (AS/NZS 1170.3:2003)

Region: N4 (Sub-Alpine)
Importance level(House - domestic dwelling) = 2
Design working life = 50 years
h_0 = 100 m
C_e(4.2.2 - sheltered roofs) = 1.0
Snow load(serviceability) = 0.4 kPa
Snow load(ultimate) = 0.887 kPa

Design Criteria

- The Lintel is to be installed by a Licensed Building Practitioner (carpentry) or under supervision of an LBP
- The top of the Lintel is to be restrained by studs at 600 mm centres
- The ends of the Lintel are to be securely supported and prevented from rotation
- The Lintel is to be a single member that is 4,800mm long
- The Lintel is to have no notches throughout its length unless referenced in standards or manufacturers literature
- The Lintel is to have an end bearing length of 45mm or greater

Serviceability Criteria (+upward, -downward)

	Span Deflection	Allowable Span Deflection

Deflection Dead Load	2.476 mm	span/300 ± 0% and 12 mm ± 0%
Deflection Live Load	2.41 mm	span/250 ± 0% and 15 mm ± 0%
Deflection Wind Down	0 mm	span/200 ± 0%
Deflection Wind Up	2.57 mm	span/200 ± 0%

Reactions (+upward, -downward)

Maximum limit state downward reaction = 6.515 kN
Maximum limit state upward reaction (wind uplift) = -2.379 kN

SpanMan complies with the requirements of the following standards:

- AS/NZS 1170.0:2002 Structural design actions, Parts 0 and 1
- AS/NZS 1170.2:2011 Structural design actions, Part 2: Wind Actions
- AS/NZS 1170.3:2003 Structural design actions, Part 3: Snow and ice actions
- NZS 3603:1993 Timber Structures Standard
- NZS 3604:2011 Timber Framed Buildings Standard
- AS/NZS 4055 - 2006 Wind loads for housing
- AS/NZS 4600 - 2005 Cold-formed steel structures
- Nash Standard: Residential and Low-Rise Steel Framing Part 1: Design Criteria 2005
- AS1720.1 - 2010 Timber Structures, Part 1: Design methods

Sizes calculated by SpanMan assume that members are installed in a manner that suits their intended structural function for the life of the structure. Members should be maintained in accordance with Australian and New Zealand standards for the life of the structure.

SpanMan does not take into account member durability or required treatments for your application. These include, but are not limited to, materials subject to wetting and drying, in or below ground applications and corrosive environments. Contact product manufacturers or timber and steel institutes for advice.

All Lumberworx products are suited to the H1.2 hazard zone.

This design certificate is void where there has been a substitution of an alternative product/material not detailed, or if used for an alternative wind or snow loading other than stated.

Spanware Pty Ltd gives no warranties in relation to the use of the section design specified this certificate and neither Spanware Pty Ltd, or Lumberworx, will accept any liability for loss or damage, either direct or consequential arising from the use of the above nominated section in an application not consistent with the input data used to generate this report or that requires additional data beyond the scope of SpanMan software.

For further information or advice please contact SpanMan at http://spanman.net/about/contact

BRACING

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	Bunn
Street and Number:	Hoffman Park
Lot and DP Number:	Lot 460 DP 549008
City/Town/District:	Christchurch
Designer:	AS
Company:	
Date:	30/09/20

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.61
Building Height to Apex (m)	5.02
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	17.63
Building Width (m)	14.20
Building Plan Area (m^2)	184.7

Building Location

Wind Zone = High

Earthquake Zone 2

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	**764**	**971**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1124**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: Bunn

									Wind	EQ
									Demand	
									764	1124
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1079 141%	1167 104%
a	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	1.20		2.4	EP1 1.2	CHH	144	162		
	External Length = 11.45								315 OK	351 OK
b	1	0.40		2.4	BL1-H	GIB®	36	40		
	2	1.10		2.4	EP1 0.6	CHH	105	116		
	External Length = 2.07								140 OK	156 OK
c	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	2.00		2.4	GS1-N	GIB®	138	120		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 1.67								252 OK	246 OK
d	1	1.20		2.4	EP1 1.2	CHH	144	162		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	0.60		2.4	EP1 0.6	CHH	57	63		
	5	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 15.15								372 OK	414 OK

Single Level Across Resistance Sheet

Job Name: Bunn

									Wind	EQ
									Demand	
									971	1124
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1106 114%	1147 102%
m	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	0.60		2.4	EP1 0.6	CHH	57	63		
	5	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 11.28								285 OK	315 OK
n	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	0.40		2.4	EP1 0.4	CHH	32	38		
	External Length = 2.13								156 OK	146 OK
o	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	External Length = 3.85								171 OK	189 OK
p	1	1.40		2.4	BL1-H	GIB®	179	146		
									179 OK	146 OK
q	1	0.60		2.4	EP1 0.6	CHH	57	63		
	2	0.60		2.4	EP1 0.6	CHH	57	63		
	3	0.60		2.4	EP1 0.6	CHH	57	63		
	4	1.20		2.4	EP1 1.2	CHH	144	162		
	External Length = 13.00								315 OK	351 OK

GIB® EzyBrace® Systems

Specification and installation manual

CBI 5113
AUGUST 2016

NATIONAL SUPPORT

VISIT: Winstone Wallboards Limited
37 Felix Street, Penrose,
Auckland 1061, New Zealand

POST: PO Box 12 256, Penrose 1642,
Auckland, New Zealand

PHONE: +64 9 633 0100

FAX: +64 9 633 0101
Free Fax: 0800 229 222

EMAIL: info@gib.co.nz

WEB: gib.co.nz

GIB® HELPLINE

0800 100 442

Based on learnings derived from the 2011 Canterbury earthquakes GIB EzyBrace® Systems have been updated to offer improved design flexibility and further simplification of the bracing design and build process.

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

- Improved user interface with simplified bracing design process.
- Increased functionality including exterior line check function, easy insert/deletion of bracing elements and built in software help function.
- Includes the new GIB® Bracing element GS2- NOM
- Allows the GIBFix® Framing System to be used in GIB EzyBrace® designs.

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

- Large hole specification updated to use a more conservative methodology.
- Guidance included for fireplace flues and range hoods.

NEW — GIBFIX® FRAMING SYSTEM

- Reduced potential for fastener pop and joint cracking as a result of timber frame movement.
- Reduced potential for on-site call backs.
- Improved thermal performance.
- Reinforced plasterboard junctions.

BRANZ Appraised
Appraisal No.928 [2016]

CONTENTS

GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until futher notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT

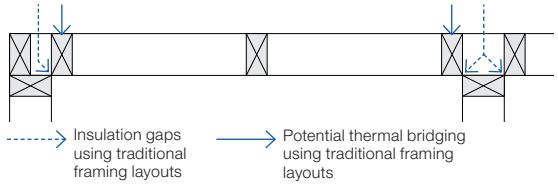


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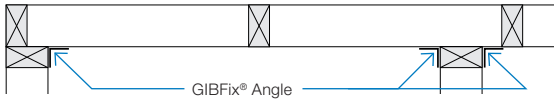
FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



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NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 — DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 — ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

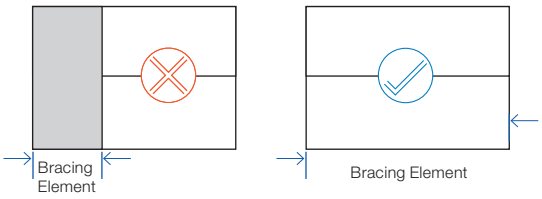
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

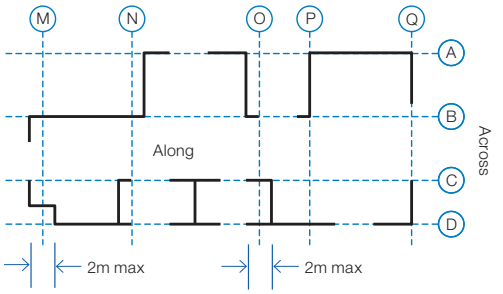
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 ‘rules’ are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®.
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- ‘N’ stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15-16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

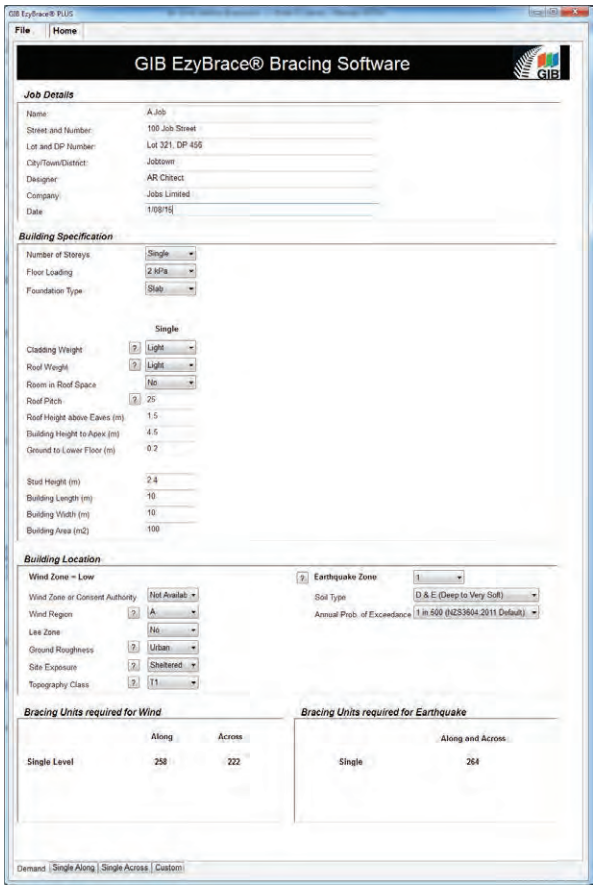
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

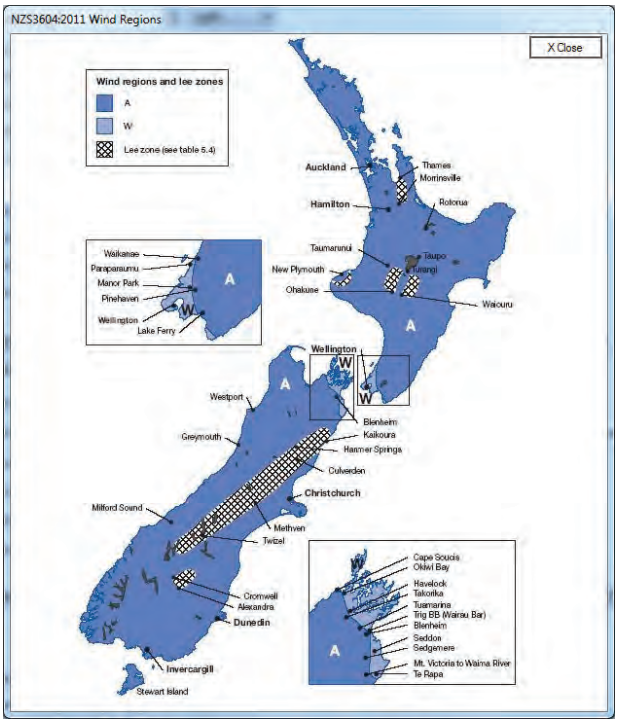
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 — DEMAND CALCULATION SHEET AND 'POP UP' HELP FACILITY





Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

Innovations adopted in the GIB EzyBrace® 2016 bracing 'resistance' calculation sheets include the ability to easily add and delete lines and elements during calculations.

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

Figures 6 and 7 show screen shots of the Wall and Subfloor Resistance Sheets respectively.

FIGURE 6: GIB EZYBRACE® 2016 — WALL BRACING RESISTANCE CALCULATION SHEET

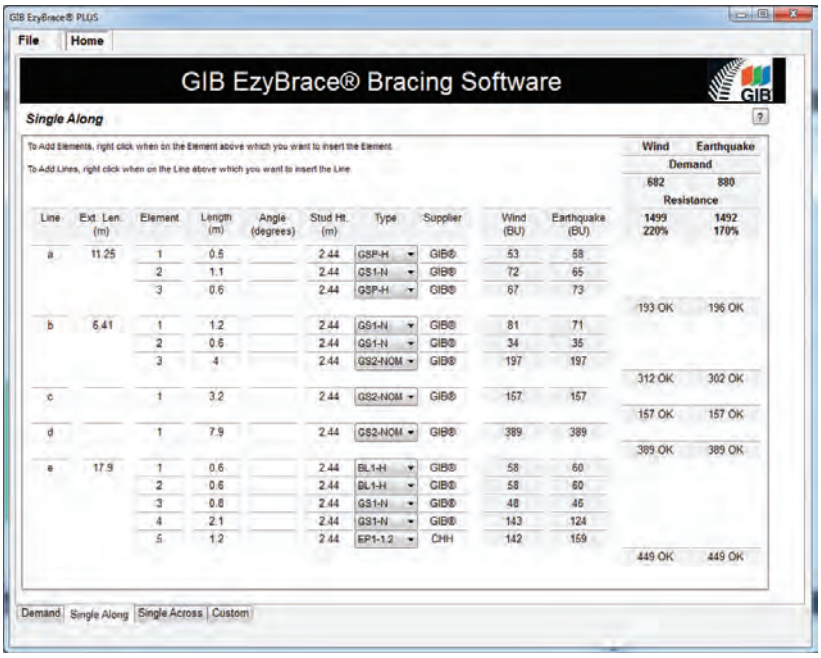
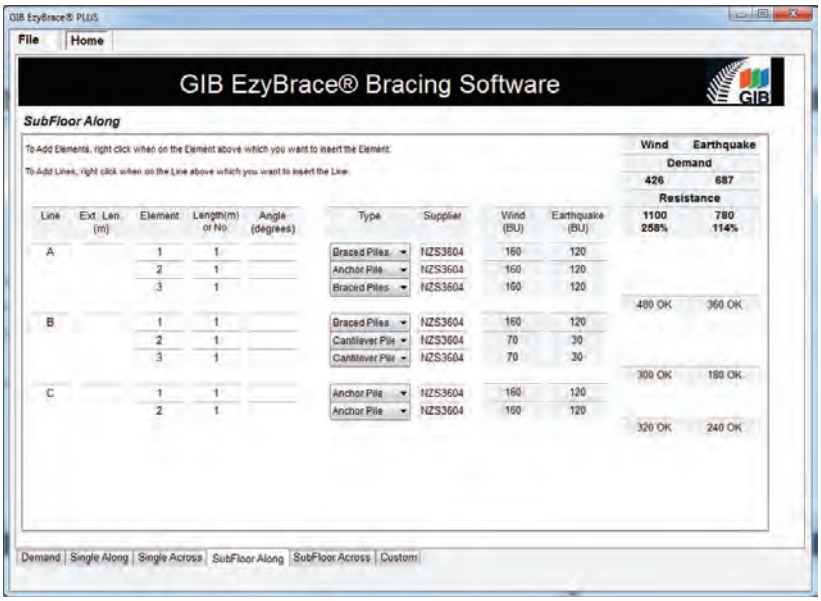


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

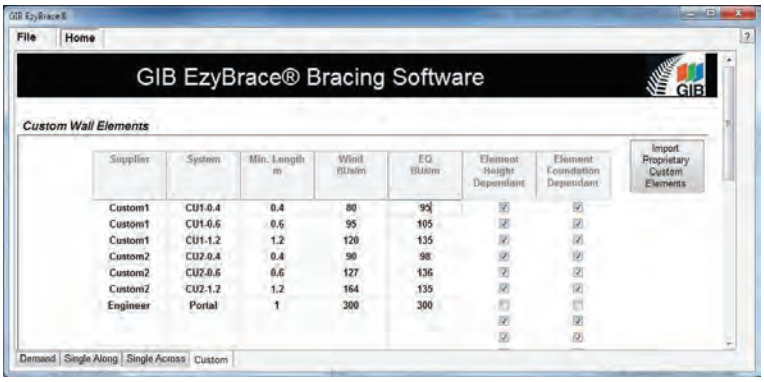


Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

Custom elements can be entered by accessing the 'custom' tab as shown in figure 8.

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



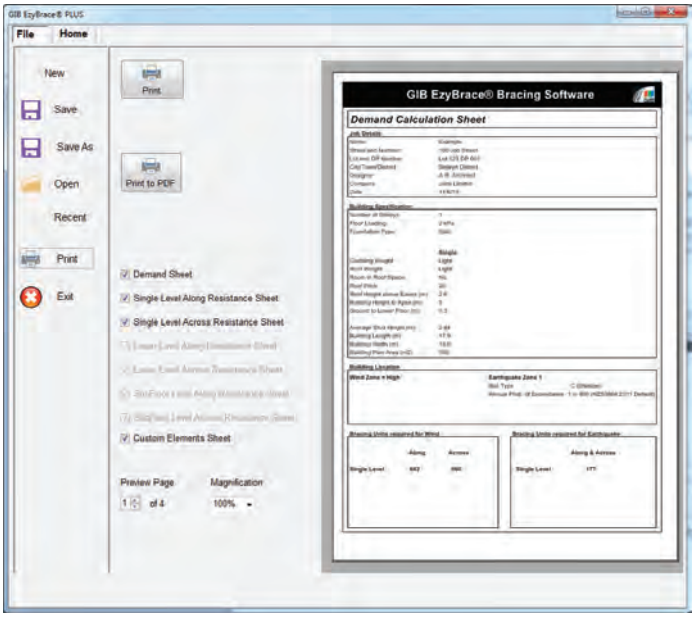
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

Help can be accessed by pressing the ? symbol which displays a window with further information.

The GIB EzyBrace® 2016 software has a number of options that can be accessed via the File tab at the top left hand corner of the window. The options include: New, Save, Save As, Open, Recent and Print.

- The New option closes any opened job ready for the input of a new job.
- The Save option saves the currently opened job to the same filename and the Save As option saves the job to a new filename.
- The Open option prompts for the name of an existing job.
- The Recent option displays a list of the ten latest jobs and allows for the selection of one of these jobs to be opened.
- The Print option displays the print screen. In this screen, a print preview is displayed. The print preview can be copied to the clipboard by clicking the right-hand mouse button. Also on the print screen is the option to choose which pages are to be printed and the option to print the output to a portable data format, PDF, file.
- The Print Screen View is shown in figure 9.

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For futher design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS

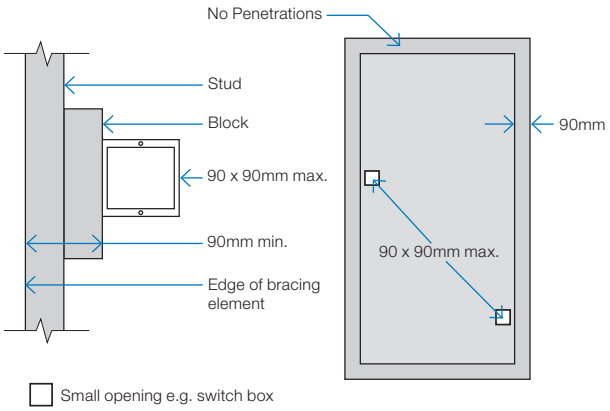


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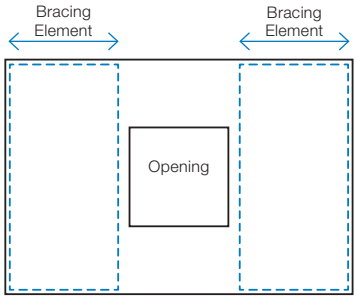
FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)

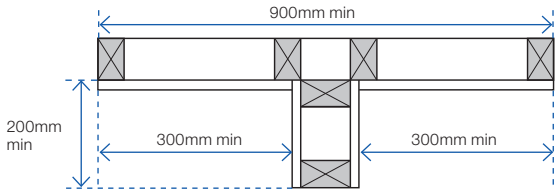


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FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)

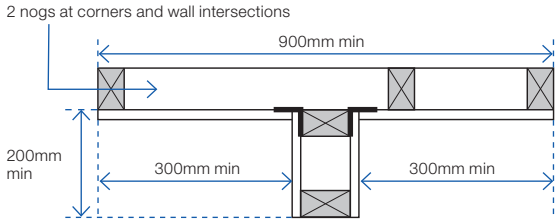

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FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)

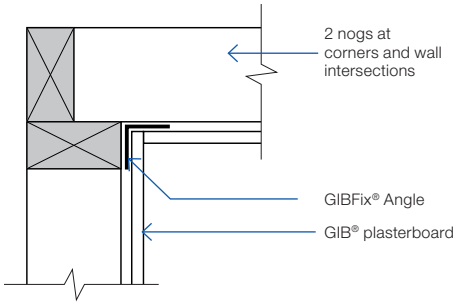

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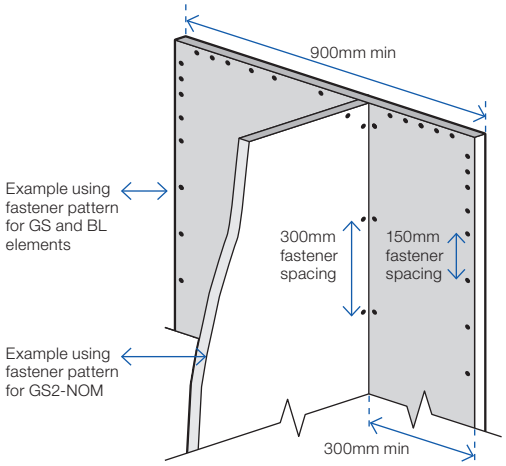
FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

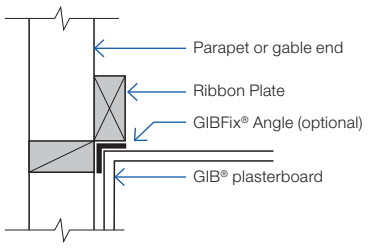
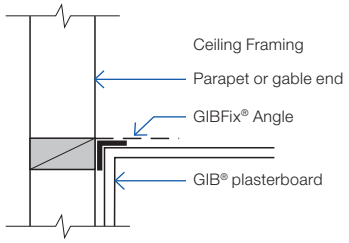


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



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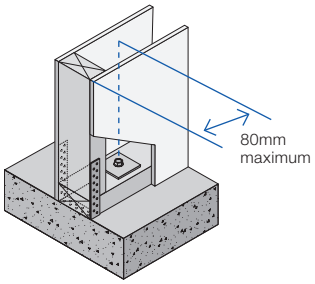
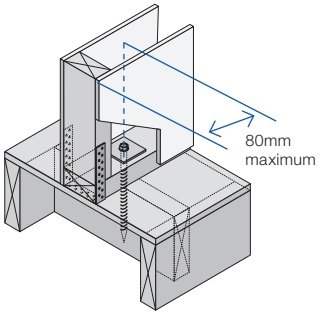
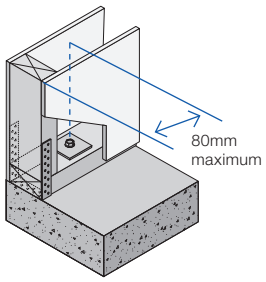
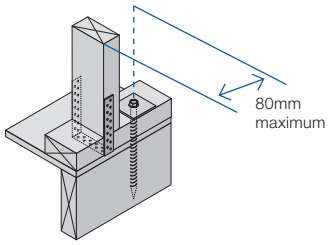
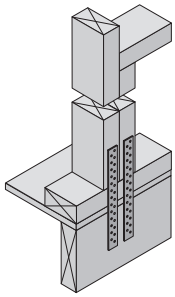
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

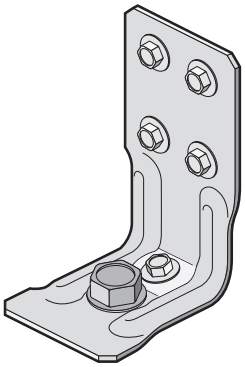
Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

Concrete floor	Timber floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

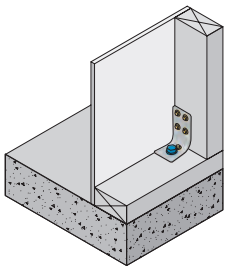
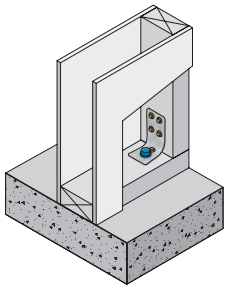
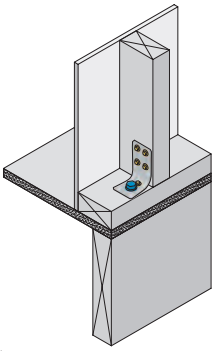
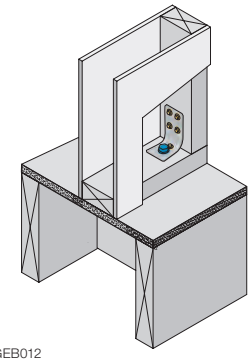
GIB HandiBrac® installation



Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.

Concrete floor		**Timber floor**	
External walls	Internal walls	External walls	Internal walls
 GEB009	 GEB010	 GEB011	 GEB012
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	Position GIB HandiBrac® in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.	

GIB HandiBrac® placement with GIBFix® Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac® panel hold-down brackets within the GIBFix® Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac® can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

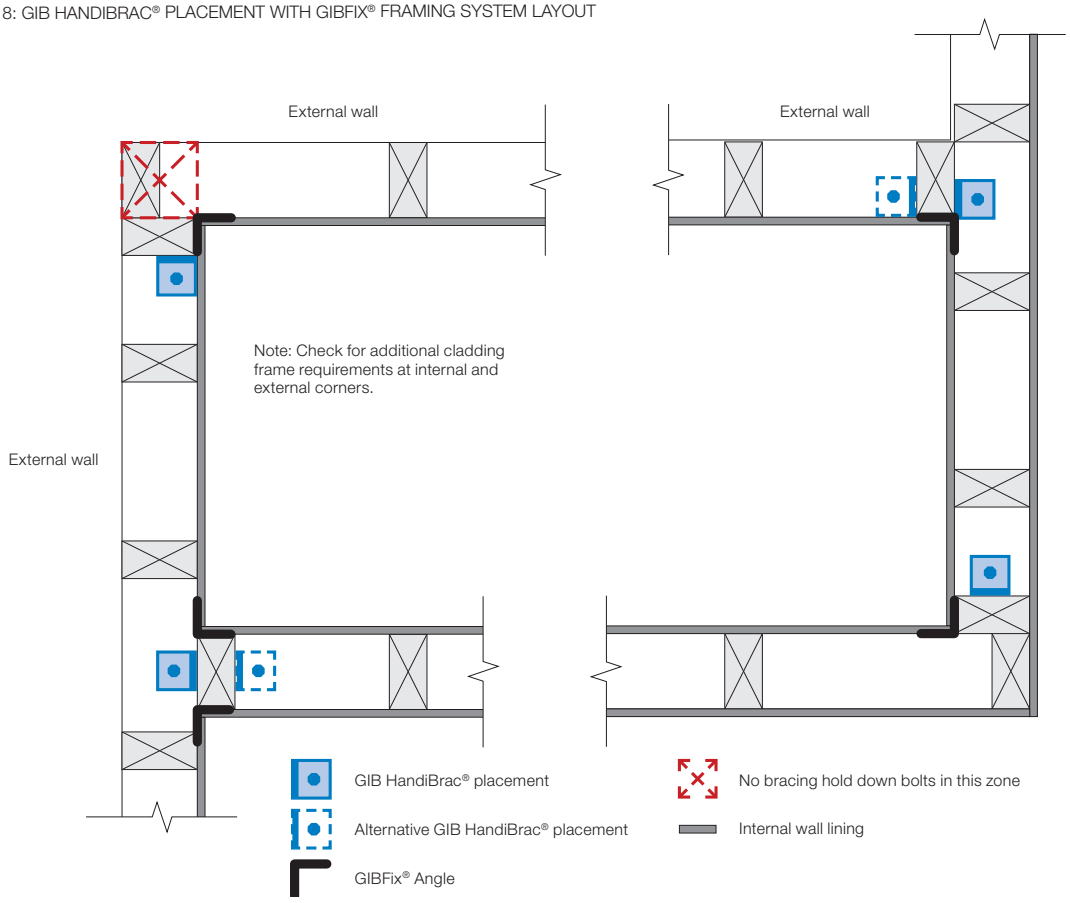
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

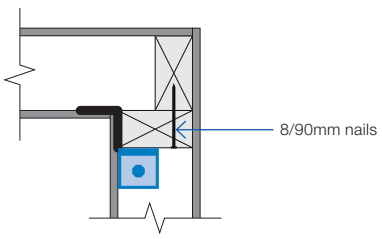
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC® PLACEMENT WITH GIBFIX® FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

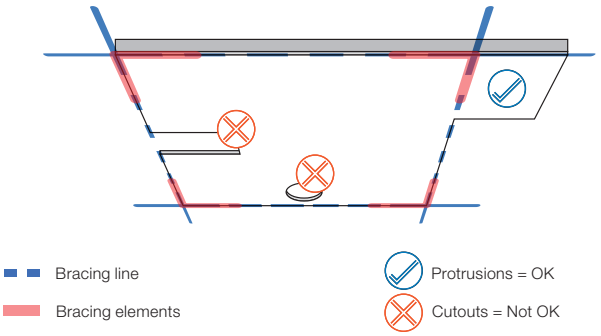


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

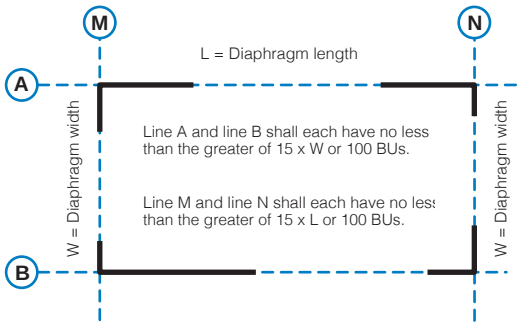
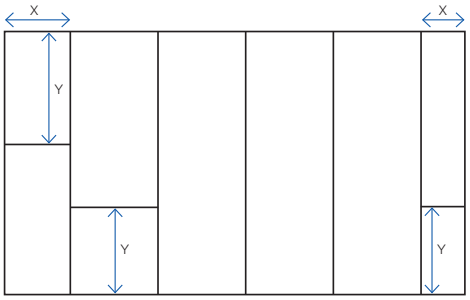
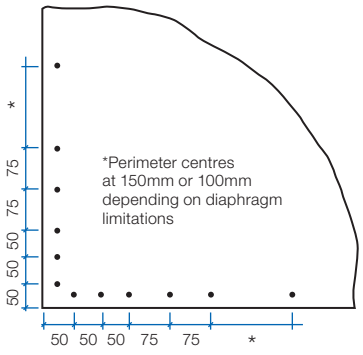


FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.
Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

Ceiling battens in ceiling diaphragms

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:
— 500mm for 10mm GIB® plasterboard.
— 600mm for 13mm GIB® plasterboard.

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

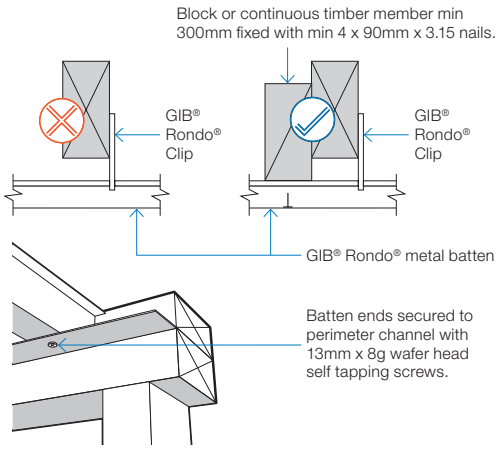
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

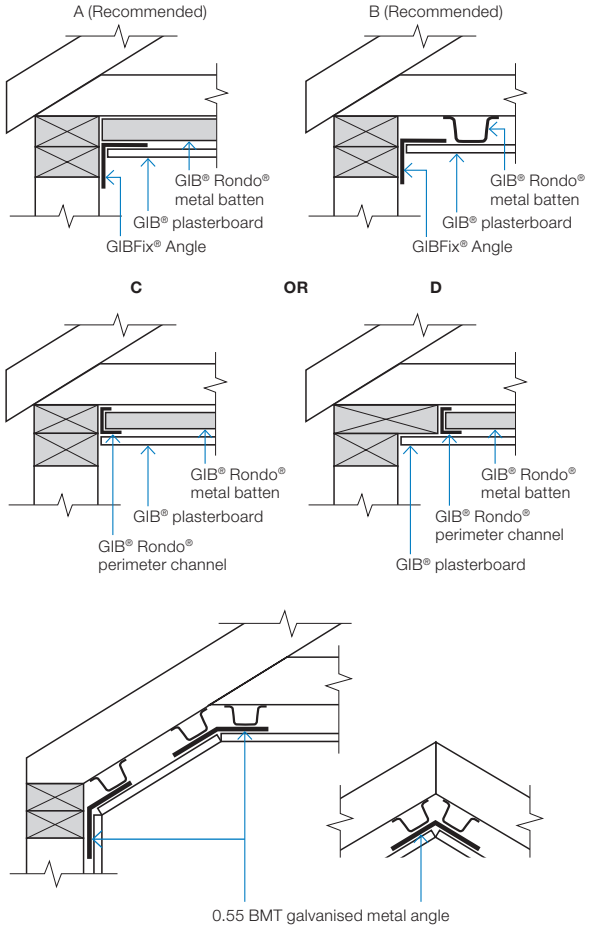
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
— Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
— Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



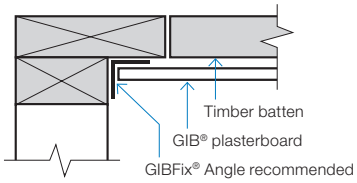
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed withing the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvansed metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

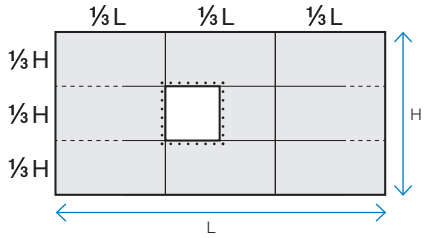
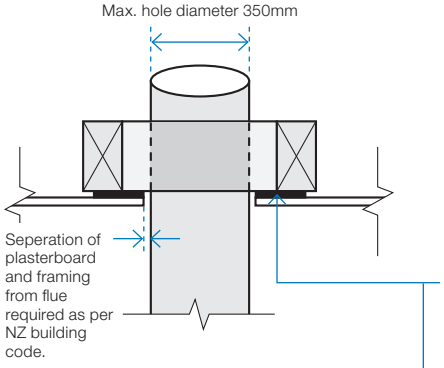
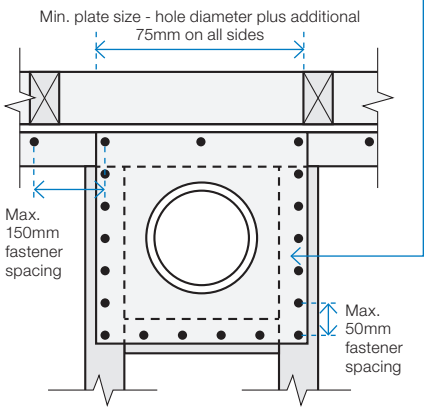


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Steel plate
0.55 BMT Galvanised sheet Max. opening 350mm diameter. Installed prior to GIB® plasterboard.

Framing
90 x 45mm framing trimmed to provide extra fixing.

GIB® plasterboard ceiling
Installed over the steel plate and into framing using a minimum of 32mm x 6g GIB® Grabber High Thread or 32mm x 7g GIB® Grabber Dual Thread screws at 50mm max centre spacing.

Plasterboard ceiling not shown in plan view

Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

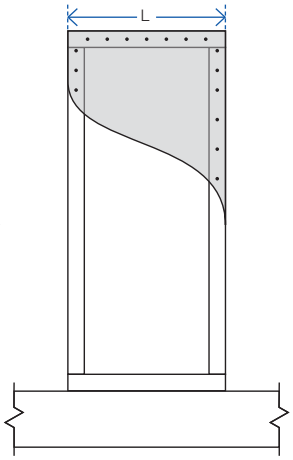
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

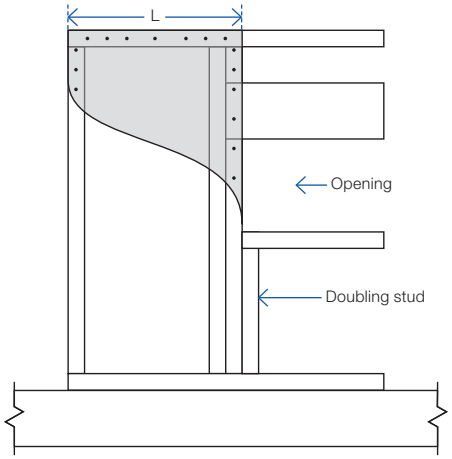
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



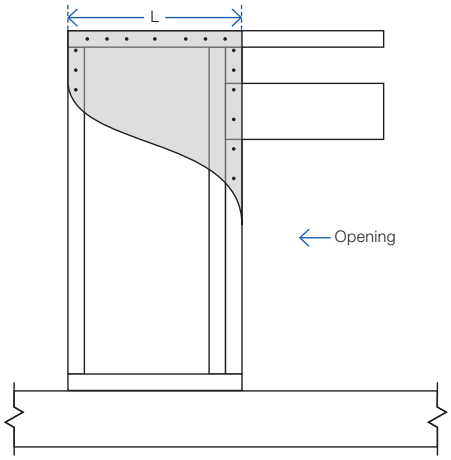
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



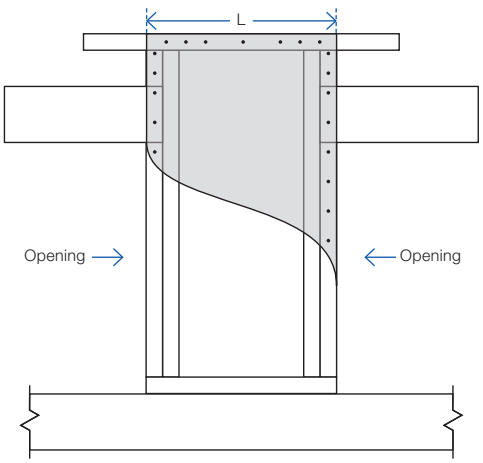
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

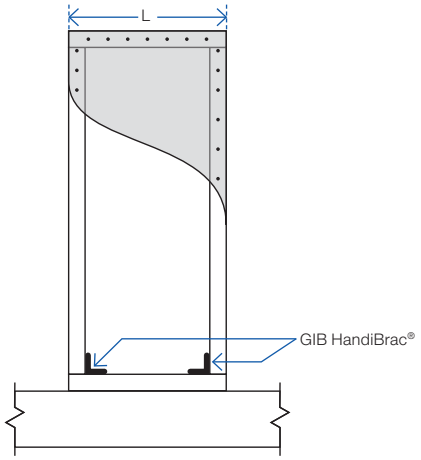
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34-36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB HandiBrac® bolt.

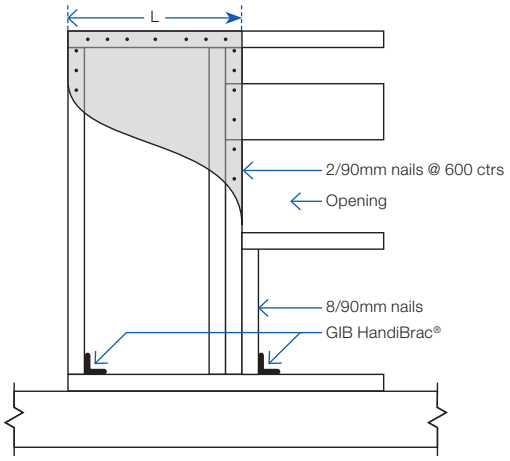
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



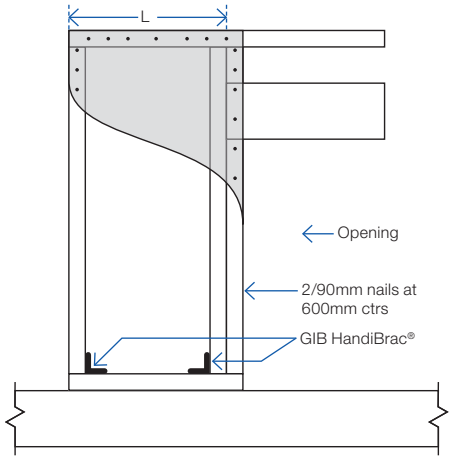
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



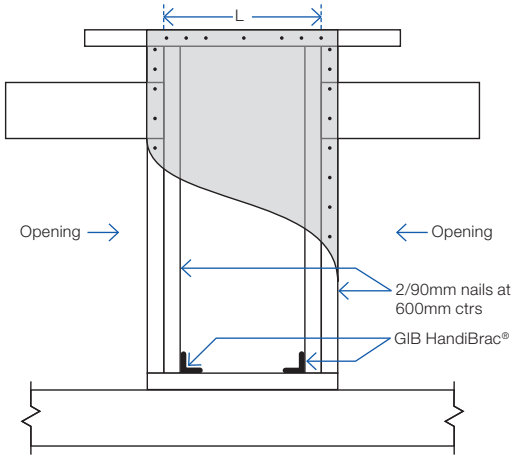
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

GIB EzyBrace® Systems specification GS1-N

Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

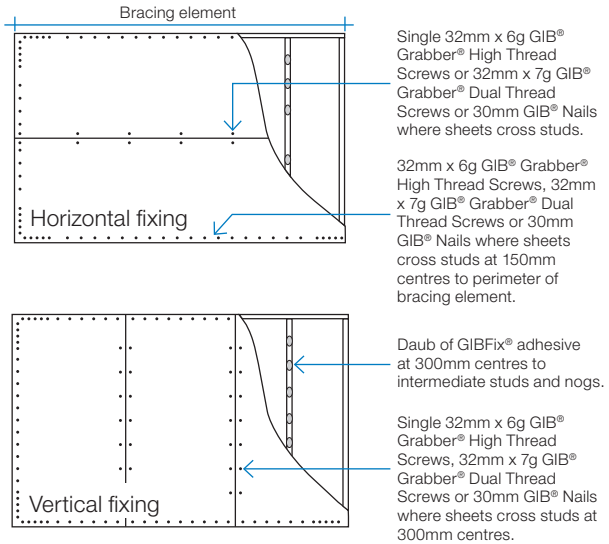
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

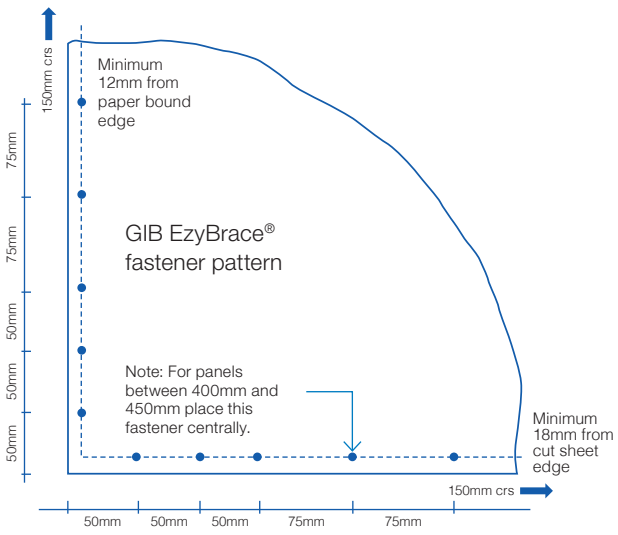
Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100mm x 3.75mm nails at 600mm centres; or three power driven 90mm x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75mm x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

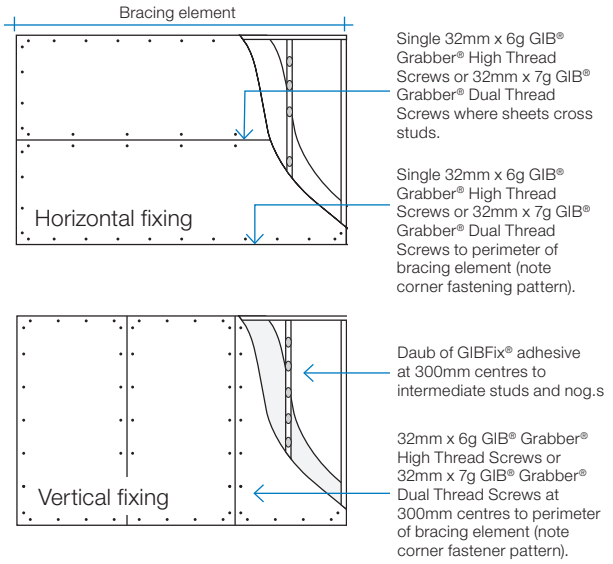
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

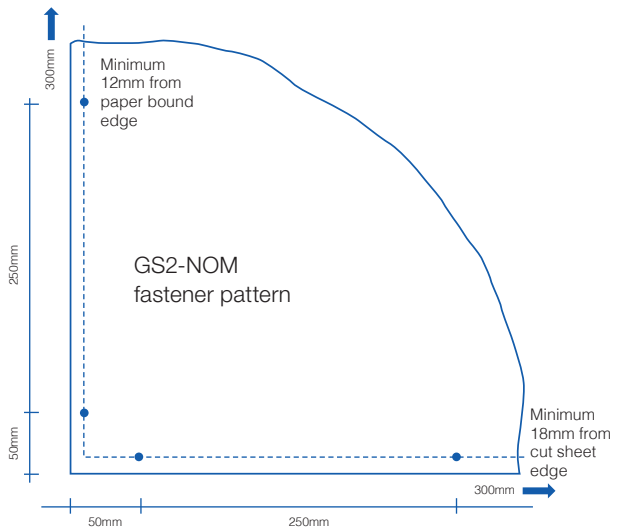
Fastener centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

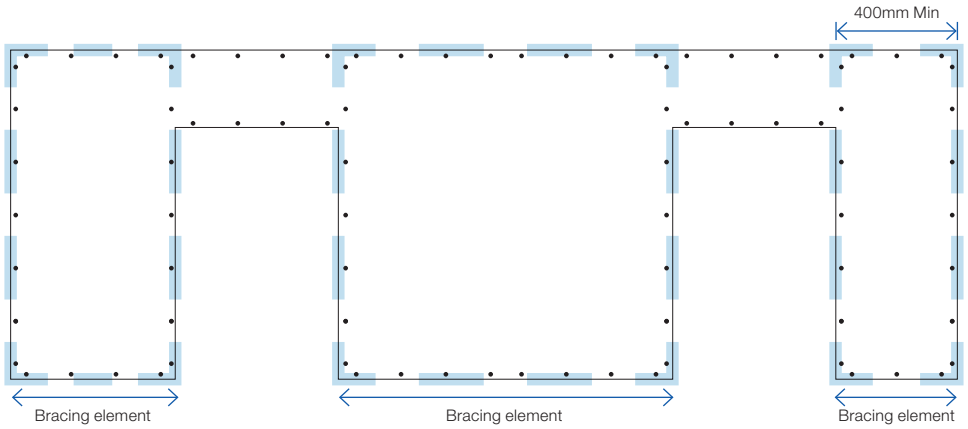
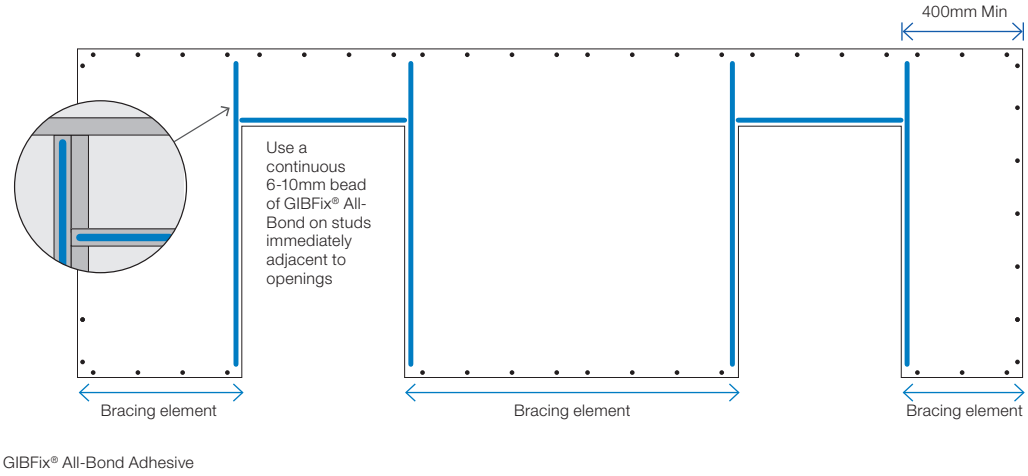
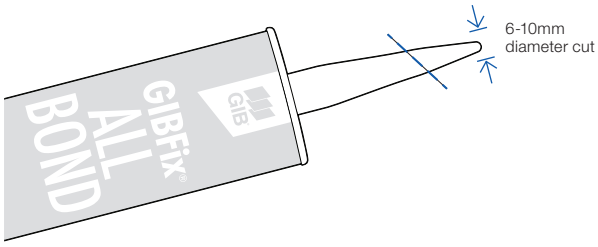


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

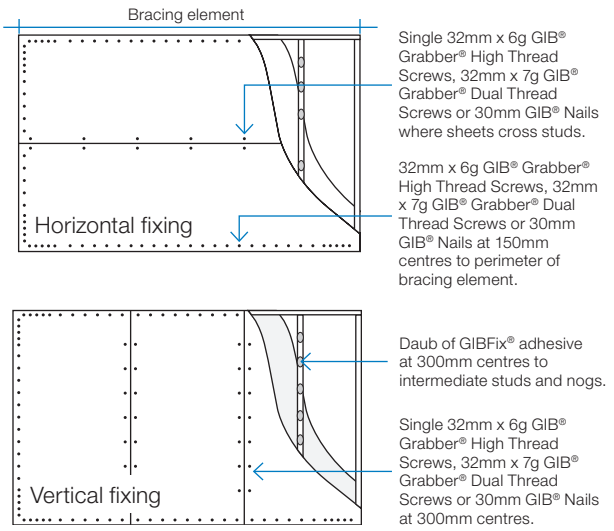
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

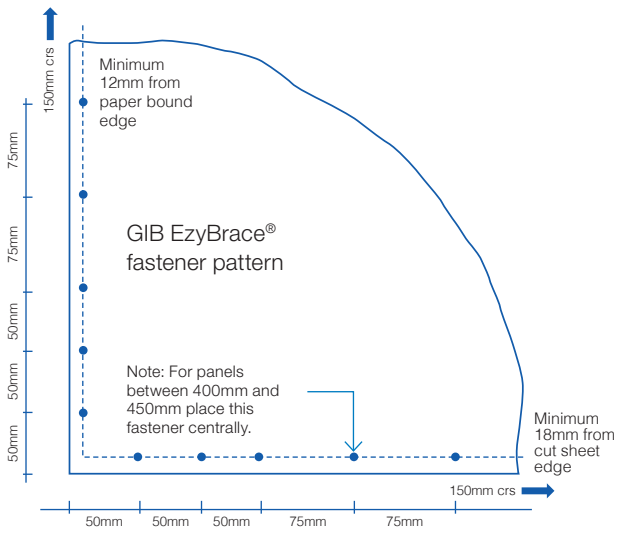
Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

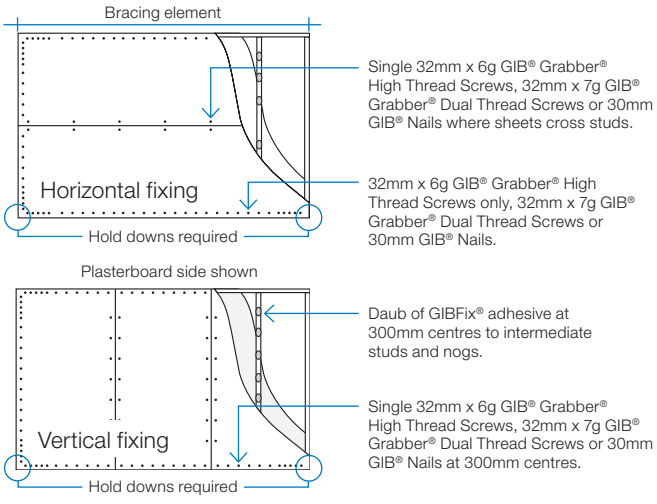
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

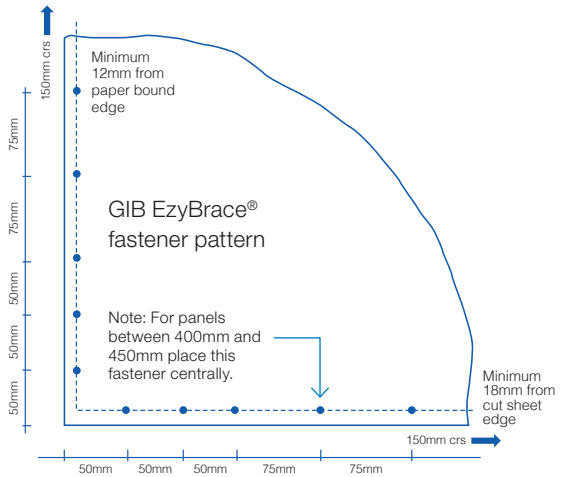
Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BL1-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline®
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

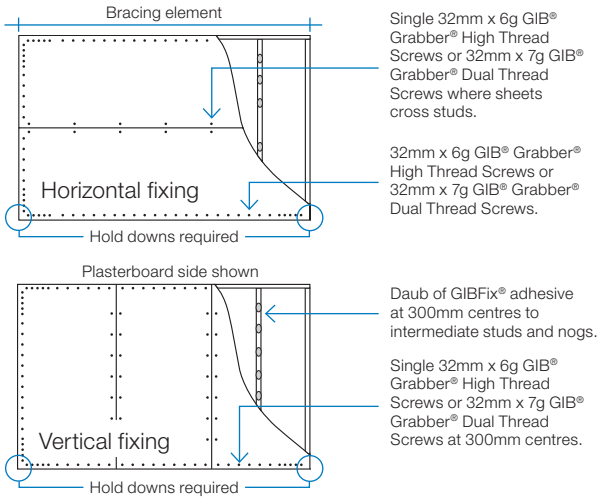
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

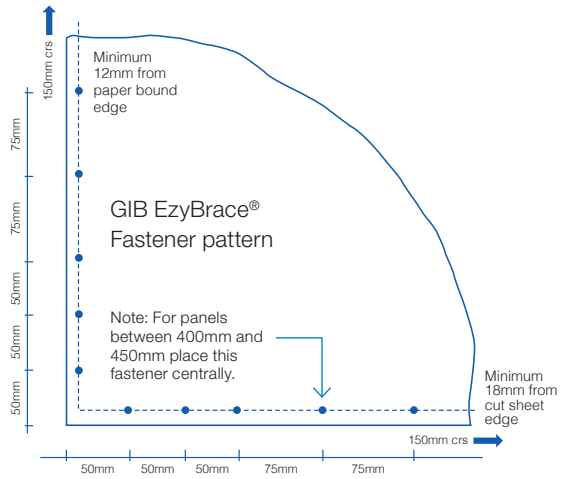
Fastener centres

50,100,150, 225, 300mm from maximum each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the sheet joint. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws.Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

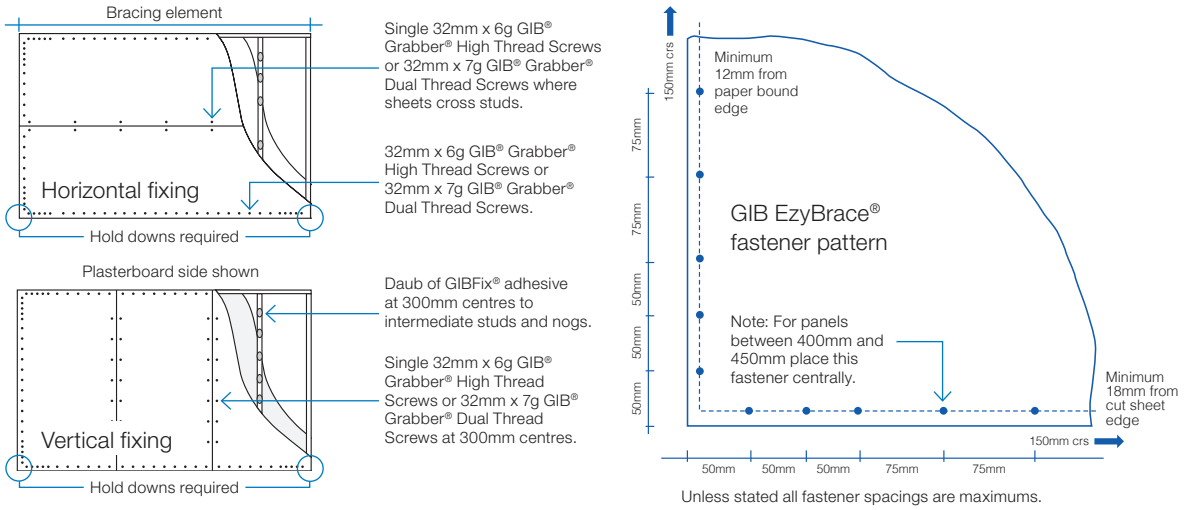
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure; B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

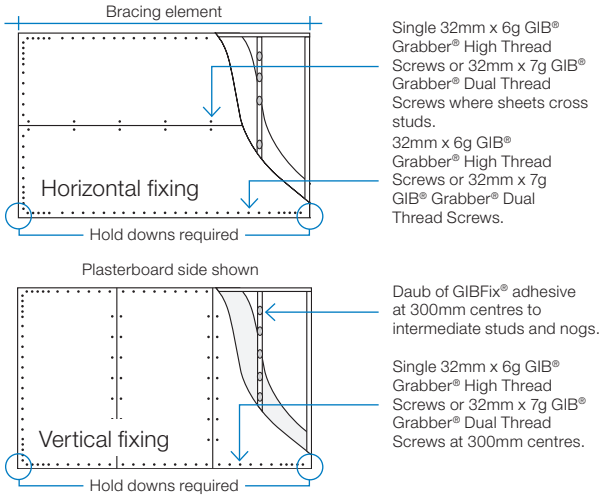
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

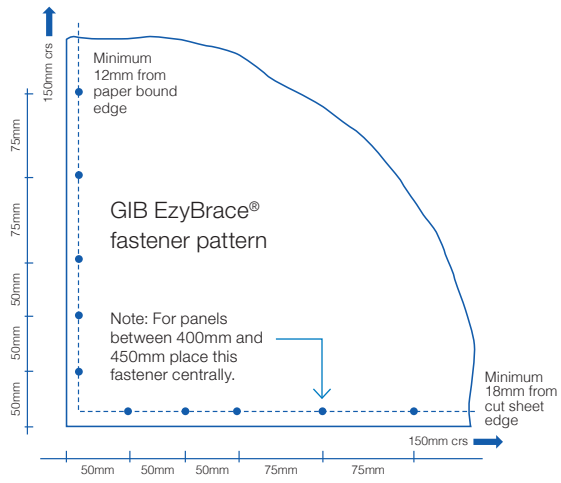
Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERTTM}

The Global GreenTag^{CertTM} certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag.^{CertTM}

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

COPYRIGHT

TRADEMARKS

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.

FOR MORE INFORMATION VISIT

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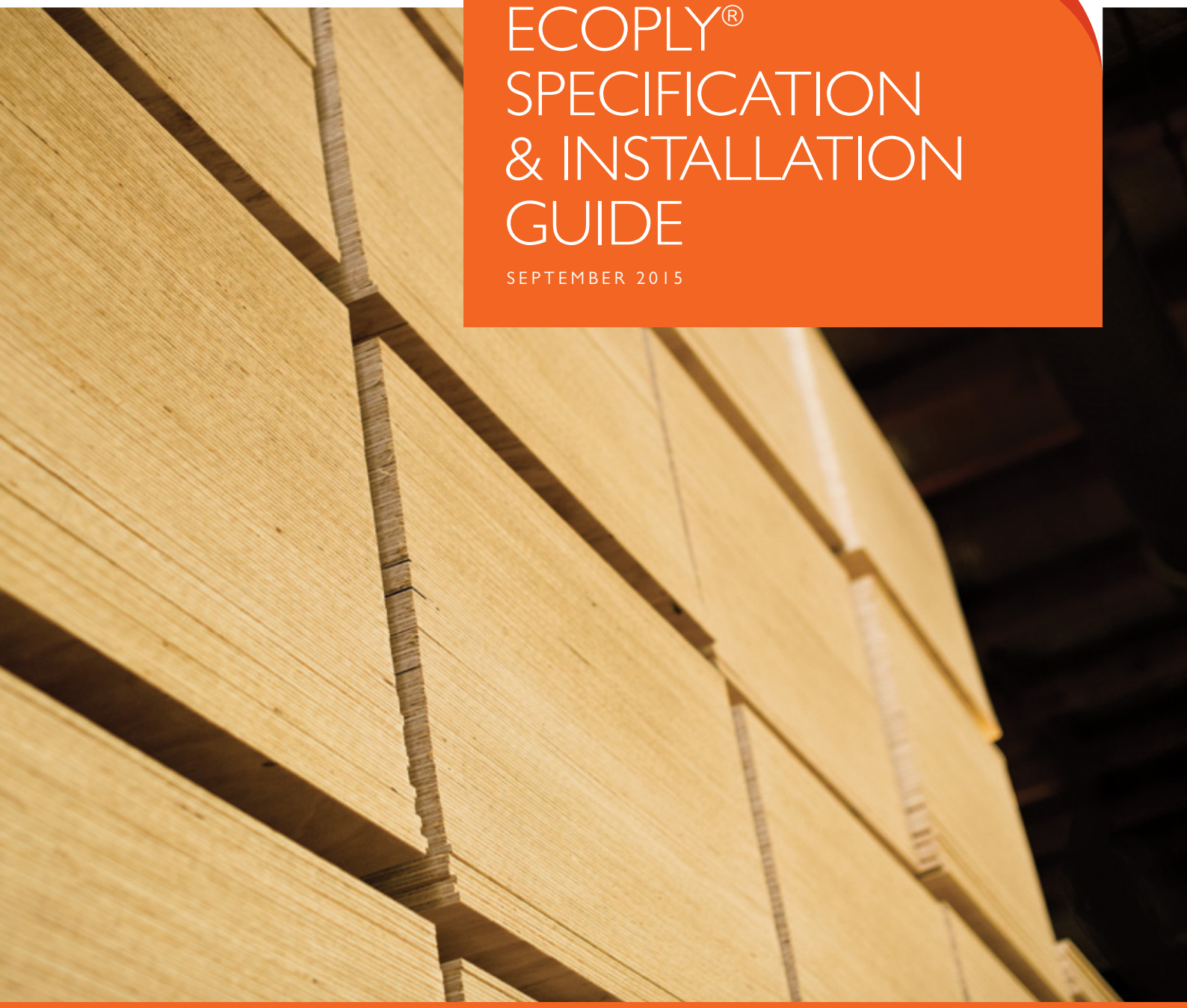
ECOPLY® SPECIFICATION & INSTALLATION GUIDE

SEPTEMBER 2015



CarterHoltHarvey Woodproducts New Zealand

Information contained within is specific to Ecoply® structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

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Proven. Durable. Strong

ECOPLY® SPECIFICATION & INSTALLATION GUIDE

Contents

CarterHoltHarvey
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1.0 ECOPLY® PRODUCT RANGE

Manufactured in New Zealand by Carter Holt Harvey Woodproducts, the Ecoply® portfolio represents a range of structurally rated plywood products.

Ecoply is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural. All Ecoply products carry Engineered Wood Products Association of Australasia (EWPAA) Joint Accreditation System - Australia and New Zealand (JAS-ANZ) certification.

For information relating to Shadowclad® panels and plywood used as an exterior cladding, refer to the current Shadowclad Specification & Installation Guide for Cavity Construction. For information relating to Ecoply Barrier used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide. Both of these documents can be downloaded from www.chhwoodproducts.co.nz.

Ecoply products must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage. This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply products. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts assumes no legal liability to you in relation to this information.

1.1 TECHNICAL INFORMATION AND CAD DETAILS

When specifying or installing any Ecoply® plywood products visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

The information contained in this document is current as at September 2015. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Ecoply structural plywood products manufactured by Carter Holt Harvey Woodproducts and must not be used with any other plywood manufacturer's product no matter how similar they may appear.

Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply structural plywood products is not appropriate, and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the NZBC.

1.2 PRODUCT DESCRIPTION AND RANGE

Ecoply structural plywood panels are manufactured from radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

The strength of Ecoply plywood is optimised for maximum performance parallel to the face grain with cross plies providing enhanced stability across the grain.

The Ecoply plywood range can be specified for:

- Surface grade (e.g. CD) - where the first letter describes the face veneer appearance and the second letter describes the back veneer of the Ecoply sheet. Surface grades are defined in AS/NZS 2269 and summarised in Tables 2A & 2B
- Stress grade - utilises the symbol F and a suffix, for example;
  - F8 as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. F8 is the standard stress grade for Ecoply products
  - Ecoply 19 mm Longspan Flooring and 15 mm Ecoply Roofing are F11[1] stress grade (See Tables 1, 4 and 5). Other Ecoply products are also available in F11[1] upon request
- Thickness - ranging from 7 mm to 25 mm. (Thicknesses above 25 mm subject to availability)
- Length - being 2400 mm and 2700 mm with a standard nominal width of 1200 mm
- Preservative treatment - being untreated, H3.2 CCA or H3.1 LOSP Azole treated
- Edge finish - being square edge or for Ecoply Flooring and Roofing, routed on the long edges of the sheet with a polypropylene plastic tongue inserted into one side for a tongue-in-groove joint

For general installation advice refer to section 2.0: General Installation Guide.

For specification and installation advice for Ecoply used in typical applications refer to the following sections.

Typical Application	Section
Structural bracing and ceiling diaphragms	3.0
Roofs and decks	4.0
Flooring	5.0

Note: Technical notes referenced in this guide can be downloaded from www.chhwoodproducts.co.nz or contact Carter Holt Harvey Woodproducts on 0800 326 759.

Table 1: Ecoply® Product Range

Nominal Thickness (mm)		7		9		12		15		17		19		21		25	
Sheet length (x 1200 mm width)		2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700
Ecoply Structural Square Edge	BD			●		●	●	●		●							
	CD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD							●	●	●	●	● LS	● LS	●	●		●
Ecoply Roofing (pt)	DD							●	●	●	●						

- ● Available untreated only
- ● Available either untreated or H3.2 CCA
- ● Available either untreated or H3.1 LOSP

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200 mm cover

LS Ecoply 19 mm F11/F8 Longspan Flooring

- Full range may not always be available ex stock, check with your Ecoply supplier to ensure availability
- Non standard specifications, including thicker sheets may be available to special order in significant quantities
- All products are F8 stress grades
- Ecoply 15 mm/17 mm Roofing and Ecoply 19 mm Longspan Flooring are supplied as standard in F11 stress grade[1]
- Other Ecoply products are also available in F11[1] upon request

[1] Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

1.3 SURFACE GRADES

Table 2A summarises the surface appearance grades in which Ecoply structural plywood is available with some typical applications for each surface grade.

The surface grade specifications are defined in AS/NZS 2269. Table 2B details surface appearance grades for specialty Ecoply plywood and typical applications.

Table 2A: Ecoply® Structural Square Edge Products

Face Grade B	Face Grade C	Face Grade D
		
Appearance grade with a solid sanded surface. Suitable for a higher quality finish.	Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish.	Non appearance grade allowing open imperfections up to 75 mm across the face veneer. Splits and knots allowable
Possible Uses:	**Possible Uses:**	**Possible Uses:**
• Furniture/Joinery/Signs • Interior Linings • Sheathing • Engineering components where a superior visual finish is required	• Structural gussets • Stressed skin panels • Bins, boxes, crates • Hoardings • Membrane substrate	• Non visual bracing • Strength critical pallets • Structural components • Portal frame gussets

Table 2B: Speciality Ecoply® Products

Flooring CD	Roofing DD
	
Solid sanded C grade surface with tongue and groove profile on long edges. Features void free second layer under the face veneer for increased protection against high point loads	Unfilled D grade surface with tongue and groove profile on long edges
Possible Uses:	**Possible Uses:**
• Substrate for flooring overlays such as linoleum, tiles and rigid coverings • Substrate for membrane roofing and decking where visible appearance is critical	• Substrate for asphalt shingles • Substrate for roof systems where a smooth substrate is not required

Notes: A higher visual grade may be substituted if required. e.g. Ecoply CD can be used anywhere DD is used. Pictures shown above are scaled down versions of typical Ecoply sheets. Grain pattern and colour may vary. If sheet appearance is critical select panels individually.

1.4 PRESERVATIVE TREATMENT

Ecoply structural plywood is available untreated or treated in accordance with AS/NZS 1604.3. If treated, Ecoply structural plywood is treated with either H3.2 CCA (Copper Chrome Arsenate) or H3.1 LOSP (Azole) clear treatment. H3.1 LOSP is the standard preservative treatment for BD Structural Square Edge products and by special request for other Ecoply plywood products.

H3.2 CCA and H3.1 LOSP treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, subject to periodic moderate wetting and leaching."

Ecoply plywood is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Holdfast® Metalex® Concentrated Timber Preservative Clear (Holdfast® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

The characteristics of the treatments are shown in Table 3.

Table 3: Preservative Treatment

	Untreated	H3.2 CCA	H3.1 LOSP (Azole)
Preservative carrier	N/A	Water	Light organic oil (white spirits)
Colour	Natural	Green	Clear (i.e. natural)
Fungicide	Heat treated dry wood	Copper	Propiconazole and Tebuconazole
Insecticide	Heat treated dry wood	Arsenate	Permethrin
Other chemicals	N/A	Chrome (to fix preservative in wood)	Butyl Oxitol (co-solvent to assist active stability)
Mouldicide	N/A	Copper (limited efficacy)	IPBC
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Dried after treatment to average 18% moisture content for use in service at higher moisture contents	Solvent does not affect dimensions. Solvent smell disappears over time
Availability	Readily available	Standard treatment except for Ecoply BD	Treated to order for CD, DD, flooring and roofing products. Standard treatment for Ecoply BD
Applications (Refer NZ3602)	Interior dry protected	Exterior/Interior damp (service performance subject to detailing & coatings)	

H3.2 CCA

Ecoply structural plywood, which is H3.2 CCA treated (waterborne preservative with a green colour), is dried following treatment so that sheets may return to the correct dimensions. The moisture content after treatment with CCA and drying will be higher than the limits placed in AS/NZS 2269 on untreated product. The target is for an average moisture content of approximately 18% to provide a panel closer to the expected equilibrium moisture content for most H3.2 CCA applications.

The fillets used to separate sheets in drying may leave marks on the sheet surface. These will fade over time as the plywood weathers, and can be disguised with paint but may be visible under stain. The process of treating with H3.2 CCA and subsequent drying is likely to increase the face checking of the panel.

For more information on face checking refer to section 1.8 General Design Considerations - Aesthetics.

H3.1 LOSP

H3.1 LOSP treated Ecoply retains the wood colour and does not contain moisture so the plywood remains at the same dimensions and moisture content during treatment. However, the plywood when freshly treated may contain more than 60 litres of organic fluid per cubic metre. When coating H3.1 LOSP treated plywood, traces of residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

The H3.1 LOSP solvent smell can be quite strong and venting is recommended until most of the solvent has evaporated. Untreated plywood is recommended for internal applications where NZS 3602 allows the use of untreated plywood

Mechanical fasteners are recommended to fix H3.1 LOSP treated Ecoply to framing. If adhesives are required, thorough venting is recommended and H3.1 LOSP tolerant adhesives should be applied according to the adhesive manufacturer's instructions. See section 2.3 Adhesives.

1.5 SECTION PROPERTIES

Table 4A: Section Properties of Ecoply® Structural Plywood

		Section properties per mm width						
		Parallel to the face grain			Perpendicular to the face grain			
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Mass** (kg/m³)	**Parallel Moment of Inertia** (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)	**Perpendicular Moment of Inertia** I (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)
7	7-24-3	4.0	30.0	8.3	5.2	2.0	1.7	2.3
9	9-30-3	5.0	58.6	13.0	6.4	4.0	2.7	2.9
12	12-24-5	6.6	115.0	19.2	9.3	33.4	9.3	5.4
15	15-30-5	8.3	225.0	29.9	11.6	65.2	14.5	6.8
17	17-24-7	9.2	285.0	33.9	12.2	122.0	20.4	9.4
17	17-24-6	9.2	273.0	32.5	12.3	134.0	22.3	9.5
19	19-30-7	10.6	451.0	46.9	13.7	157.0	23.8	10.7
21	21-30-7	11.6	556.0	52.9	15.2	239.0	31.9	11.8
25	25-30-9	13.5	897.0	72.9	17.8	381.0	41.0	13.9

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F8 Grade

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F8)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1046.5	480.0	15.6	303.9	231.7	9.2
15	15-30-5	2047.5	747.5	19.5	593.3	362.5	11.4
17	17-24-7	2593.5	847.5	20.5	1110.2	510.0	15.9
17	17-24-6	2484.3	812.5	20.7	1219.4	557.5	16.0
19	19-30-7	4104.1	1172.5	23.0	1428.7	595.0	18.0
21	21-30-7	5059.6	1322.5	25.5	2174.9	797.5	19.8
25	25-30-9	8162.7	1822.5	29.9	3467.1	1025.0	23.4

Table 4C: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F11[1] Grade (Including Longspan Flooring)

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F11)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1207.5	595.2	16.7	303.9	231.7	9.2
15	15-30-5	2362.5	926.9	20.9	593.3	362.5	11.4
17	17-24-7	2992.5	1050.9	22.0	1110.2	510.0	15.9
17	17-24-6	2866.5	1007.5	22.1	1219.4	557.5	16.0
19	19-30-7	4735.5	1453.9	24.7	1428.7	595.0	18.0
21	21-30-7	5838.0	1639.9	27.4	2174.9	797.5	19.8
25	25-30-9	9418.5	2259.9	32.0	3467.1	1025.0	23.4

1 Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

2 Actual thickness of Ecoply sheets manufactured to thickness tolerances stated in AS/NZS 2269

3 Identification code: panel thickness – outermost veneer thickness x 10 – number of plies

4 I/Q values for rolling shear are for stress at the neutral axis calculated as in NZS 3603

Notes:

- Use Tables 4A & B values for all F8 stress grade Ecoply products
- Use Tables 4A & C values for all F11 stress grade Ecoply (including 19 mm Ecoply Longspan Flooring)
- The section properties in Tables 4A, B & C have been calculated in accordance with AS/NZS 2269
- For section properties for other thicknesses and Shadowclad® products contact CHH Woodproducts on 0800 326 759

Structural properties of Ecoply® plywood

The majority of Ecoply plywood is F8 grade (exceptions are identified in section 1.2: Product Description & Range) and the characteristic values may be used in conjunction with both NZS 3603 and AS 1720 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Tables 4B and 4C.

Table 5: Structural Properties of Ecoply® Plywood

	Characteristic Strength MPa	
Stress Grade	**F8**	**F11**
Bending (f_{pb})	25.0	31.0
Tension (f_{pt})	15.0	18.0
Panel shear (f_{ps})	4.2	4.5
Rolling shear (f_{pr})	1.7	1.8
Compression in plane of sheet (f_{pc})	20.0	22.0
Compression normal to the plane of the sheet (f_{pp})	9.7	12.0
Modulus of elasticity (E)	9100	10500
Modulus of rigidity (G)	455	525

Source: AS/NZS 2269

Wood is strongest when stressed parallel to the grain and weakest across the grain, so the lay up or arrangement of veneers in the panel determines the properties. Because of its cross banded construction, plywood possesses significant strength and stiffness both parallel and perpendicular to the direction of the face grain, but is generally strongest and stiffest along the direction of the face grain.

The section properties of structural plywood in Table 4A are calculated in accordance with AS/NZS 2269 to allow for the reduced contribution of veneers perpendicular to the direction of stress. For engineering design to NZS 3603, the section properties are multiplied by stresses and 'k' and ø factors to determine resistances for limit states design.

Resistances and nominal strengths in Tables 4B and 4C assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ø and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Table 5A: Strength Reduction Factors

Structural Timber Material	**Application of Structural Member**		
	Category 1	**Category 2**	**Category 3**
	Structural members for houses for which failure would be unlikely to affect an area[1] greater than 25 m²; OR secondary members in structures other than houses	Primary structural members in structures other than houses; OR elements in houses for which failure would be likely to affect an area[1] greater than 25 m²	Primary structural members in structures intended to fulfil essential services or post disaster function
	Value of Strength Reduction Factor Ø		
Structural Plywood – AS/NZS 2269.0	0.95	0.85	0.75

[1] In this context area should be taken as plan area.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name: e.g. ECOPLY
- Face grade, back grade: e.g. CD
- Intended application: e.g. STRUCTURAL
- Panel construction code: e.g. 19-30-7 (Thickness (mm)-Face veneer thickness (mm x 10)-Number of veneers)
- Glue bond: eg. A BOND
- Formaldehyde emission class: E0 for A Bond Ecoply
- Australasian Standard: e.g. AS/NZS 2269
- Treatment Standard (if applicable): eg. AS/NZS 1604.3:2012
- Date and time of manufacture: e.g. 01/12/15 12:23:45
- Stress grade: e.g. F8 (exceptions include Shadowclad® and Grooved Lining which are performance rated)
- The Engineered Wood Products Association of Australasia (EWPAA) brand and mill number: e.g. 911 (Tokoroa mill)

Untreated example:

ECOPLY CD FLOORING STRUCTURAL
19-30-7 A BOND E0 AS/NZS 2269.0:2012
PAT 01/12/15 12:23:45 F11/F8
911

Treated example:

ECOPLY CD STRUCTURAL
25-30-9 A BOND E0 AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA
RETREAT CUTS PAT 01/12/15 12:23:45 F8/F8
911

Note: Performance based products like Grooved Lining and Shadowclad may include brand identification instead of visual quality, stress grade, and panel code. These panels, when accompanied with specification literature, are still deemed to comply with AS/NZS 2269

1.7 CODE COMPLIANCE

Ecoply plywood manufacture is third-party audited through the product quality control programme of the Engineered Wood Products Association of Australasia (EWPAA) which is itself audited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

CHH Woodproducts is licensed by the EWPAA to stamp plywood with the EWPAA/JAS-ANZ Product Certification Mark. This certifies it has been manufactured under the third party audited Joint Product Certification programme to monitor compliance with joint Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural. Plywood to this standard is referenced in the NZBC Acceptable Solutions and Verification Methods through:

- NZS 3602 The Use of Timber and Wood-based products for Use in Building
- NZS 3603 Timber Structures
- NZS 3604 Timber Framed Buildings
- AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood
- E2/AS1 External Moisture

WARNING: Plywood which is non-certified or is manufactured to standards other than AS/NZS 2269, such as US voluntary standard PS1-95, is not referenced in the NZBC. There can be significant differences between AS/NZS 2269 certified and non certified plywood around bond durability, structural ratings and veneer quality.

Structure B1

Design to NZS 3603 Timber Structures complies with the NZBC in Verification Method B1/VM1 Clause 6.0 Timber. Plywood is the only sheet material with properties listed in NZS 3603. Ecoply structural plywood is available in F8 stress grade. Some specialty products are available F11 or with specifically designed properties for specialised applications.

1.8 GENERAL DESIGN CONSIDERATIONS

Durability (Clause B2) and exterior moisture (Clause E2)

Ecoply plywood is made from softwood solid radiata pine veneer. Designers should assess the level of exposure to biological, moisture, and other hazards and apply appropriate preservative treatment and detailing to minimise exposure to these hazards.

Information in this manual outlines suggested practices for detailing building components to exclude moisture to comply with the durability requirements of the NZBC.

Formaldehyde

Ecoply plywood is manufactured using phenol formaldehyde resins which are fully cured in the hot press. Cured resin is thermally and moisture stable and formaldehyde emissions for the glued plywood are similar to background levels for the wood by itself when tested to AS/NZS 2098.11 Determination of formaldehyde emissions for plywood. Accordingly every panel is branded with the lowest emission class (less than 0.5 mg/litre for E_0).

Actual formaldehyde emissions for Ecoply plywood have been tested and approved as having an actual formaldehyde emission level of less than 0.3 mg/ litre (equivalent to a Super E_0 emission level).

Moisture content and dimensional change

At the time of leaving the factory, the moisture content of untreated Ecoply plywood should generally be in the range of 8% to 15% as required by AS/NZS 2269. All wood products including plywood respond to changes in ambient humidity so the eventual moisture content of plywood varies according to how dry or how wet the environment is. After manufacture, the moisture content will move to equilibrium with the environment, and the veneers swell or shrink across the grain in response. The total expansion both along and across a 2400 x 1200 mm panel can be in the order of 1.5 mm to 3 mm as the plywood changes from a dry to a saturated state.

Ecoply that is treated with waterborne preservatives (e.g. H3.2 CCA) is expected to be used in applications that have higher humidity than interior dry use, so following treatment it is dried to a higher average moisture content of approximately 18%. This provides for a more stable panel in service than placing a dry (less than 15%) sheet in a higher moisture environment.

Detailing and construction must allow for movement if the plywood will be subject to cycles of moisture change. Seasonal and daily cycles can be significant depending on the end use.

Temperature

Wood will expand upon heating as do practically all solids. The thermal expansion of plywood is quite small and there is little effect on the structural performance or durability of plywood when used in temperatures below 54°C. The average co-efficient of thermal expansion of plywood is 4.5 x 10-6 mm/mm/°C. At temperatures above 55°C wood begins to deteriorate. Colours of coatings and finishes should be selected to reduce heat gain. For extreme conditions, further technical information is available by calling CHH Woodproducts on 0800 326 759.

The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 Methods of determining the total thermal resistance of parts of buildings. e.g. Plywood has a Conductivity (k) of 0.13 W/mK so a 12 mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Aesthetics

Ecoply plywood products can be selected for decorative or weather protection functions as well as structural performance. Acceptable Solution E2/AS1- External Moisture allows plywood manufactured to AS/NZS 2269, (minimum CD appearance grade, minimum 12 mm thickness and treated as required by NZS 3602) to be used for exterior cladding. For exterior cladding applications CHH Woodproducts strongly recommends Shadowclad® exterior cladding rather than smooth faced plywood such as Ecoply.

Shadowclad® features a textured (bandsawn) face which reduces the visibility of face checking and other appearance related issues which can occur on smooth faced plywood if not regularly maintained by the homeowner. For more information on plywood used as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction.

Face checks on plywood exposed to weather

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. If you are the specifier, it is important to discuss these issues with your client and consider the length of exterior exposure, climate conditions and protection offered by the surface coating before finalising product choice.

Durability

The durability of Ecoply structural plywood will depend on the application. Detailing, treatment and installation details need careful consideration to satisfy the requirements of the NZBC.

Normally, 50 year durability can be achieved with untreated Ecoply in dry, interior exposure. For internal environments subject to high humidity or condensation H3.2 CCA treated Ecoply should be used.

For plywood as a rigid air barrier (including rigid air barrier acting as bracing) refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhwoodproducts.co.nz.

Fire, spread of flame and smoke development

The following data on early fire hazard properties of uncoated Ecoply plywood are the result of tests carried out by Australian Wool Testing Authority AWTA to test structural plywood manufactured to AS/NZS 2269 in accordance with ISO 5660, reaction to fire tests (heat release, smoke production and mass loss rate). Part 1: Heat Release rate (cone calorimeter method).

Table 6 summarises the test configurations and associated material groups.

For plywood with decorative finish coatings or intumescent coating, performances depend on spread rates of the coating. For advice on specific coating systems and their suitability for use with Ecoply products, always refer to the coating manufacturer.

Table 6: Early Fire Hazard Properties of Ecoply® Plywood

Material	Species	Origin	Thickness	Treatment	Material groups
Plywood	Radiata Pine	New Zealand	7mm	CCA Treated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	CCA Treated	Group 3

1.9 SUSTAINABILITY

Ecoply is manufactured from radiata pine. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Ecoply is manufactured in New Zealand at CHH Woodproducts Tokoroa plywood mill.

Ecoply is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

1.10 HEALTH & SAFETY

Ecoply should be handled in accordance with the Material Safety Data Sheets (MSDS) for untreated, H3.2 CCA and H3.1 LOSP treated Ecoply, which can be downloaded from www.chhwoodproducts.co.nz.

Always wear safety glasses or non-fogging goggles when machining Ecoply panels.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn.

Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

1.11 STORAGE & HANDLING

Ecoply panels must be stored and handled with care to maintain good condition before use and after installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity
- Support for the sheets must be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in sheets)
- The stack must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage
- The sheets must be stacked flat, NOT on edge
- Store in well-ventilated areas away from sources of heat, flame or spark
- To avoid staining, fading and surface checking, the sheets must not be exposed to the weather while awaiting installation
- Store in well-ventilated areas away from sources of heat, flames or sparks

2.0 GENERAL INSTALLATION GUIDE

The following is a general guide to be followed unless otherwise specified. For additional installation instructions for typical applications refer to sections 3, 4 and 5.

2.1 FRAMING

Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. All timber frame sizes and set out must comply with NZS 3604 (or be specifically designed to NZS 3603). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz. Ecoply may be specified for frame spacing determined by design, or using tables in section 3 for specific product applications such as bracing, flooring and as a substrate for shingle roofs or membrane roofs and decks.

H3.1 LOSP treated framing should be vented before fixing and if construction adhesives are required (for example to screw and glue floor panels) the adhesive must be compatible with H3.1 LOSP. See section 1.4: Preservative Treatment.

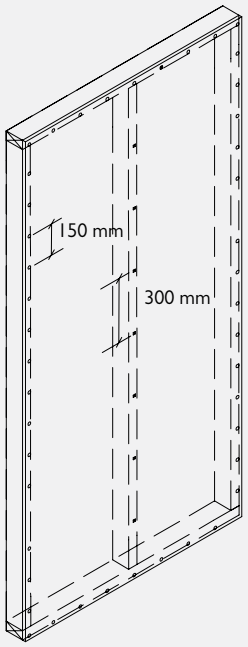
For plywood used as exterior cladding refer to the current Shadowclad® Specification & Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide which can be downloaded from www.chhwoodproducts.co.nz

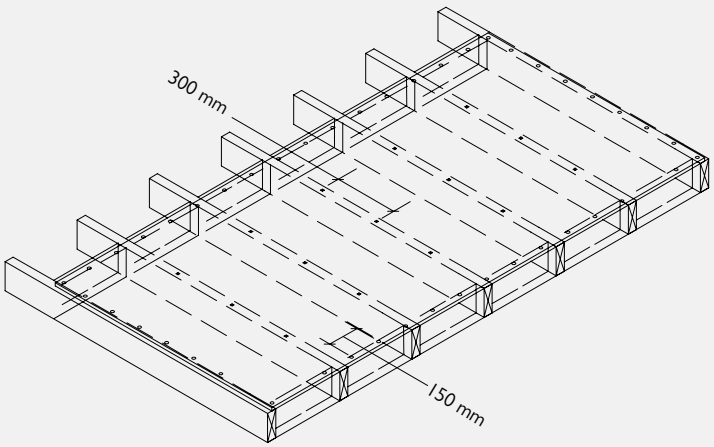
2.2 SHEET FASTENERS AND FIXING

- Where there is risk of panel size change due to changes in moisture levels, allow a 2 to 3 mm expansion gap between sheets
- Use only flathead nails or screws, with or without construction adhesives
- Fastener length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is the greater. Longer or ring shank nails may be specified
- Fasteners must be at least 3 fastener diameters or 7 mm from the edge of the sheet
- For tongue and groove products such as flooring and roofing fasten 15 mm from tongue and groove edges
- Standard fixing pattern: unless otherwise specified fasten edges and ends of sheets at 150 mm centres, and within the panel at no more than 300 mm centres (see diagram below)
- Use hot dipped galvanised fasteners or corrosion resistant fasteners (i.e. stainless steel) determined by design for specific hazards
- Where using stainless steel nails, nails must be annular grooved
- Refer to Table 7 for minimum fastener sizes
- Do not overdrive power driven nails

EC001: Fastener spacings for Ecoply®



Ecoply® fastened in vertical plane



Ecoply® fastened in horizontal plane

EC002: Fastener spacings from edges

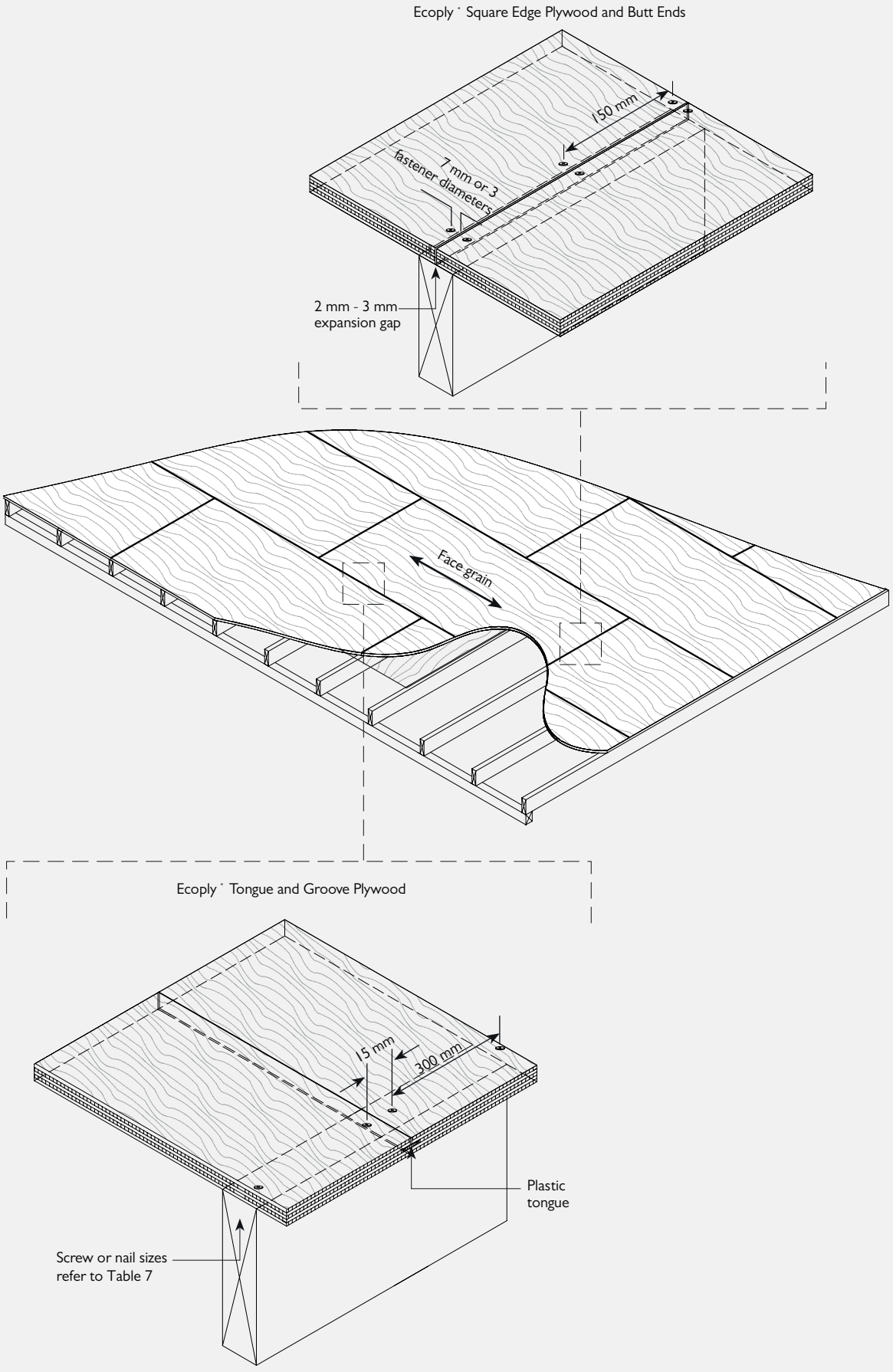


Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm / 9mm	Load[1]	12mm / 15 mm	Load[1]	17 mm	Load[1]	19mm / 21mm	Load[1]	25 mm	Load[1]
Minimum nail size in timber framing[2]	40 x 2.5 mm	570	60 x 2.8 mm	736	60 x 2.8 mm	736	60 x 2.8 mm	736	75 x 3.15 mm	883
Screw size in timber framing[2]	8g x 30 mm	1230	8g x 40 mm	1230	10g x 40 mm	1650	10g x 45 mm	1650	10g x 50 mm	1650
1.15 mm steel framing[3]	10-24-35[4]	1300	10-24-40[4]	2000	10-16-45[4]	2100	10-16-45[4]	2100	10-16-45[4]	2100
Screw size in 2.80 mm steel framing[3]	10-24-35[4]	1200	10-16-404	1200	14-20-45[4]	3000	14-20-45[4]	4000	14-20-45[4]	5000

1 The load is the characteristic load (N) for one fastener in single shear

2 Characteristic load based on fixing into a timber of J5 joint group or better

3 Self tapping, self countersinking screw

4 Screw Numbers indicate: Gauge – Threads per inch – Length (mm)

Notes

- Steel thickness, screw sizes, characteristic loads, refer to assemblies actually tested
- Other screw sizes may be used. Screw properties vary between screw suppliers and the suitability of a particular size should be verified by the designer for performance under changing physical conditions and cyclic loading
- Non-standard nailing may be specifically designed with NZS 3603 or similar

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Notes

H3.2 CCA treated timber should not be fixed in direct contact with light gauge steel products. Refer to the framing manufacturer for advise on fixing and treatments.

2.3 ADHESIVES

Tube applied construction adhesives

Site applied construction adhesives may be used together with nails and screws for non permanent loads, reduced fastener popping, and to lower the risk of squeaking in floors. Available types include polyurethane (e.g. Holdfast® Gorilla Nailpower®) and elastomeric (e.g. Bostik® Wallboard Gold) based adhesives.

Elastomeric adhesives should meet the requirements of APA Performance specification AFG 01 Adhesives for field gluing plywood to wood framing. Other types should have appraisal from an independent authorising body such as BRANZ or equivalent authorities for the specific applications proposed. Follow manufacturer's recommendations. In addition:

- Use a bead or daubs of adhesive as per manufacturer's recommendations
- Apply pressure using fastener patterns outlined in section 2.2: Sheet Fasteners and Fixing
- Work from the middle of the sheet outwards to develop glueline pressure
- Ensure adhesives are compatible with treatment in the framing timber, see section 1.4: Preservative Treatment

Structural adhesive joints

Structural bonds are generally only achievable in factory controlled conditions using approved structural adhesives in accordance with approved standards for glue lamination, e.g. Resorcinol formaldehyde joints made to AS/NZS 1328 Glued laminated structural timber. Site gluing is not recommended for structural plywood components. Contact CHH Woodproducts on 0800 326 759 for further information.

3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZBC - B1 Structure, and NZS 3604 *Timber Framed Buildings* or specifically designed to NZS 3603 *Timber Structures Standard.*

Any Ecoply structural panel may be used for bracing as long as it is 7 mm, 9 mm or 12 mm thick, has a minimum wall length as described in Table 9, treated for the specific application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this guide.

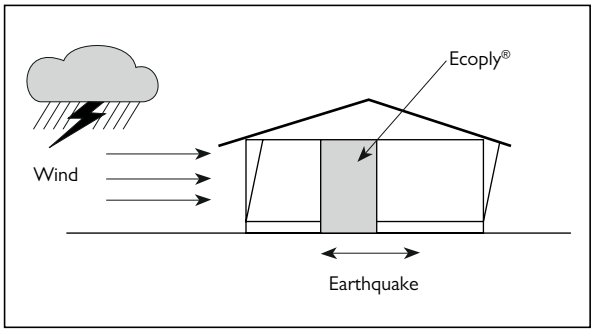
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Specific design



Ecoply structural plywood is manufactured to AS/NZS 2269, and it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Demand is calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz

EP bracing systems properties can be easily loaded into the EzyBrace software by way of an Excel patch downloadable from www.chhwoodproducts.co.nz together with loading instructions.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120 BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120 BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120 BUs/m.

Durability

Ecoply plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability Clauses of the NZBC.

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the required preservative treatment and fastener material.

Table 8: Ecoply® Suitability for Bracing Applicatons Including Treatment Type & Fastener Material

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray): E.g. Interior linings	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/ without building paper/ wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply® Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones[1] D	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones, as per section 4 of NZS 3604 (including sea spray)	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

Note: Power driven nails are suitable for use. Do not overdrive, nails must be full round head

Rain wetting and construction bracing

Untreated Ecoply will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and condensation

In conditions where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3.1 LOSP or H3.2 CCA treated to resist decay or insect hazard.

Subfloor sheet bracing

H3.2 CCA treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, 100% acrylic exterior coating system with a light reflectance value of 50% or greater.

Adjustments for wall height

Use section 5 of NZS 3604 to calculate bracing values: "Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4 m, the bracing rating determined by test or from Table 9 should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4 m high shall be rated as if they are 2.4 m high.
(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
(c) Walls with heights < 1.5m, Specific Engineering Design is required.

Joining panels for walls higher than maximum sheet length

Ecoply bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.4 m, Ecoply and Shadowclad® is available in 2.7 m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications (e.g. 2.4 m x 1.2 m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7 m x 1.2 m bracing element).

Cladding as bracing

12 mm Ecoply (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weathertight cladding and bracing element when installed in accordance with E2/AS1.

It should be noted smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Woodproducts to be a manufacturing or product fault. For more information refer to section 1.8: General Design Considerations - Face Checks on Plywood Exposed to Weather. H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

Plywood for exterior cladding applications where a high visual appearance is desired, CHH Woodproducts recommends the use of Shadowclad as an exterior cladding. Shadowclad has a textured (bandsawn) face which reduces the visibility of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100 mm above decks or paved ground and a minimum of 175 mm above unprotected ground.

Service penetrations in bracing elements

Small openings (e.g. power outlets) of 90 x 90 mm or less may be placed no closer than 90 mm to the edge of the braced element, or waste pipe outlets of max. 150 mm diameter placed at no closer than 150 mm to the edge of the braced element.

3.2 ECOPLY® BRACING SPECIFICATIONS SUMMARY

CHH Woodproducts has a range of bracing specifications called the EP bracing series. The EP bracing series simplifies the design and construction of bracing elements using plywood, by itself or in conjunction with GIB® Plasterboard and features:

- Single sided and double sided bracing elements High performance bracing element utilising GIB® Standard plasterboard
- A single type, GIB Handibrac®, hold-down for all bracing elements
- Specifications for each bracing element type

Table 9: Summary P21 Ratings for 2.4m High Ecoply® Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.4 m	Ecoply one side	80	95
	0.6 m		95	105
	1.2 m		120	135
EPG	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
	1.2 m		150	150

Note: Bracing and other technical information has been specifically tested using Ecoply branded structural plywood. This information cannot be used with any other plywood brand and bracing data must be sought directly from the specific plywood manufacturer.

More information

The following pages provide a full specification of EP bracing elements. Copies of specifications can be downloaded from www.chhwoodproducts.co.nz

NZS 3604 provides the method of calculating demand on a building. Calculation sheets are available from BRANZ or GIB EzyBrace® software is available as a free download from www.gib.co.nz. Information is available at www.chhwoodproducts.co.nz which can be placed in the custom elements of GIB EzyBrace® for ease of calculation

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.3 ECOPLY® BRACING SPECIFICATION - EPI

Table 10: Singled Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1_0.4	0.4 m	Ecoply one side	80	95
EP1_0.6	0.6 m	Ecoply one side	95	105
EP1_1.2	1.2 m	Ecoply one side	120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604)
- NZBC B2 - Durability: AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe® of SG8 stress grade minimum, is recommended.

Bottom plate fixing

Use GIB Handibrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

One layer of 7 mm, 9 mm or 12 mm Ecoply plywood fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening the Ecoply® panels

Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

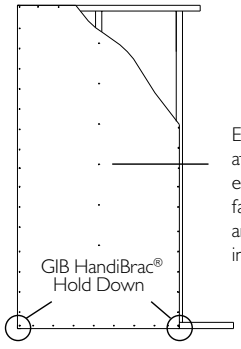
Fasteners for H3.2 CCA treated Ecoply® panels

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised.

In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Table 11: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.4 ECOPLY® BRACING SPECIFICATION – EPG

Table 12: Structural Plywood Brace with Plasterboard Other Side

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EPG_0.4	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
EPG_1.2	1.2 m		150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604)
- NZBC B2 - Durability: AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe® of SG8 stress grade minimum, is recommended.

Bottom plate fixing

Use GIB HandiBrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

Side 1: One layer of 7 mm, 9 mm or 12 mm Ecoply plywood exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Side 2: One layer of 10 or 13 mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® panels

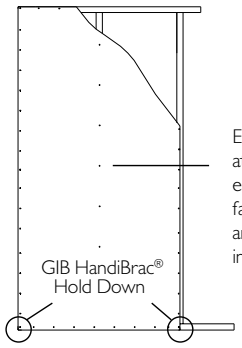
Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Fastening the GIB® Plasterboard

32 mm x 6 g GIB® Grabber® Screws or 35 mm GIB® Nails

Fastening centres

Fasten 50, 100, 150, 225 and 300 mm from each corner and 150 mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300 mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12 mm from paper bound edges and 18 mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.

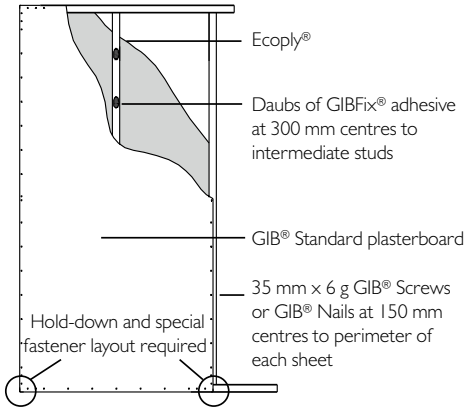


Table 13: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones including sea spray, as per section 4 of NZS3604):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones1 B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone1 D (sea spray), as per section 4 of NZS3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in eexposure zone D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

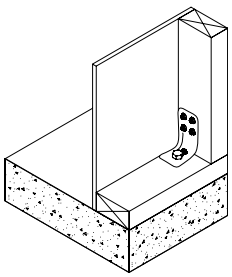
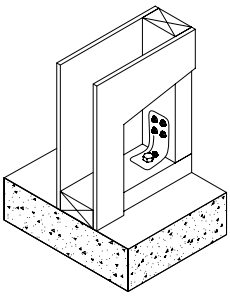
* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

3.5 GIB HANDIBRAC® – RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as the hold-down in all EP bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings

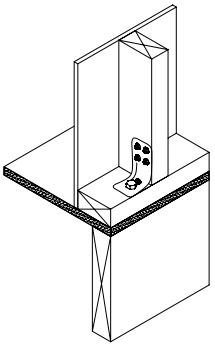
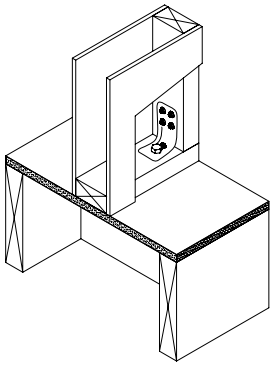
Concrete Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate	Position GIB HandiBrac® at the stud/plate junction

Hold-down fastener requirements

A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket

Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block

Hold-down fastener requirements

M12 x 150 mm galvanised coach screw

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3.6 STRUCTURAL CEILING DIAPHRAGMS

Diaphragms are used to transfer lateral loads to braced walls and allow for greater spacing between bracing lines. Diaphragms do not have a BU rating themselves.

Plywood diaphragms are an acceptable solution as described in section 13 of NZS 3604 13.5.2 which allows for plywood not less than 6 mm thick and a minimum of three ply for:

(a) Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
(b) Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs

Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

(a) The length of diaphragm shall not exceed twice its width measured between supporting walls
(b) The ceiling lining must consist of plywood over the entire area of the diaphragm
(c) Complete sheets with a minimum size of 1800 x 900 must be used
(d) Framing size and spacing must comply with NZS 3604
(e) Fastener size should comply with Table 7 of this guide. E.g. 40 mm x 2.5 mm flat head nails for 7 mm and 9 mm Ecoply
(f) Fastening is at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing
(g) Fixings are no closer than 10 mm from sheet edges
(h) Perimeter ceiling framing must be connected to wall framing by a perimeter 140 mm x 35 mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55 mm thick steel angle or proprietary steel channel
(i) Sheets must be layed in a staggered pattern
(j) The basic shape of a ceiling diaphragm should be rectangular. Protrusions are permitted but cut-outs are not (see Figure 13.4 NZS 3604)

4.0 ROOFS AND DECKS

The section below covers the use of Ecoply plywood used as a substrate for flexible membrane and tile systems in roofing and decking applications. The information below should be considered as supplementary to system specifications from roofing and decking suppliers.

Further guidance on installation and detailing factors can be found in the EWPAA Technical Note; Plywood Roofing and Flooring: Installation and Detailing Factors. This can be downloaded from www.ewp.asn.au

Ecoply is not recommended as a substrate for exterior decks without a properly detailed barrier material such as butyl rubber, vinyl or E.P.D.M to protect the surface from weathering.

Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products.

4.1 FLEXIBLE MEMBRANE SYSTEMS

- Roofing and decking membranes may comprise synthetic rubber sheeting glued to the Ecoply, or torch welded bitumen membranes
- Always ensure Ecoply is dry and free of imperfections such as surface dust and blemishes as membranes coatings will telegraph any substrate imperfections
- Use Ecoply Flooring or Structural Square Edge (CD Grade)
- Where Ecoply Flooring is used consider the use of a small daub of glue or nail in the Tongue & Groove of each sheet if potential movement of the plastic tongue joint is not acceptable
- For trafficable decks use a minimum 17 mm thickness, refer to Table 15A and 15C for specification
- Use countersunk stainless steel screws and adhesive on framing to avoid head popping. Apply adhesive between screw locations
- Use kiln dried timber framing such as Laserframe® or appropriate LVL framing from the Futurebuild® range
- Consult the membrane manufacturer regarding use of bond breaker tapes over joints to allow elongation with natural plywood movement
- Where treatment is required use only H3.2 CCA treated Ecoply. Do not use H3.1 LOSP treated Ecoply (solvent based carrier). It is not compatible with most membrane systems. If there is evidence of treatment salt crystals on the Ecoply surface remove by scrubbing with a small amount of water and allow the surface to dry prior to laying the membrane system

Plywood substrates, face checking and flexible membrane systems

All natural wood based products (including Ecoply) have the potential to develop natural surface face checks when exposed to external environmental conditions. The degree of face checking is dependent on a number of factors including the length of time and level of exposure to weather during construction which is outside the manufacturing control of CHH Woodproducts. For more information see section 1.8: General Design Considerations - Face Checking on Plywood Exposed to Weather.

Face checks, while typically not present after manufacture, do not affect structural performance of the sheet and are acceptable under AS/ NZS 2269. They are not a manufacturing fault.

Designers and membrane suppliers must carefully consider the suitability of plywood as a substrate for the membrane system in question if the potential of telegraphing of face checks onto the membrane surface is not acceptable.

The risk of telegraphing can be reduced by protecting the plywood surface from weather and moisture during the construction process.

Where the potential of face checking in the plywood substrate is not acceptable designers should consult the membrane supplier for a more suitable membrane or an alternative substrate.

Allowing for moisture expansion of plywood under roof and floor coverings

Membrane suppliers have held different views on the requirements for plywood substrates. The fixing instructions within this guide are the starting point but designers must detail joints that allow for expansion in accordance with practices recommended by the chosen membrane supplier.

CHH Woodproducts' view, and the recommendation of a number of suppliers here and in North America is that expansion and contraction at sheet edges should be allowed for by loosely butting tongue and grooved edges so that the tongues can absorb movement and providing a small gap (2 to 3 mm) between square sawn edges. Use a bond breaking tape over these joints to spread elongation in the membrane over a longer distance than the narrow gap in the joint itself. This tape can double as a rain seal over the sheet edges during construction.

Other membrane suppliers believe that sheets should be tightly butted and glued and screwed hard up to each other. This practice constrains movement at the small joint between sheets, but over a wider area requires significant allowance for movement around the perimeter of a roof segment. Junctions between the roof slopes and walls need careful detailing to allow for the potential movement. Movement control joints should be provided at regular intervals following the recommendation of the membrane manufacturer, especially if this method is adopted.

4.2 ROOF TILE SYSTEMS

Most fibreglass, asphalt or wooden shingle and tile systems will tolerate DD grade surface characteristics.

- Use unsanded Ecoply Roofing (DD grade), or sanded Ecoply of the required thickness in Table 15A
- The unsanded surface provides extra grip on steeper roofs for roofers
- Fix tiles according to the tile manufacturer's specification
- Under asphalt shingles use felt underlay over the Ecoply

4.3 ROOFING & DECKING – PRODUCT SELECTION GUIDE

Table 14: Roofing and Decking Product Selection Guide

	Structural Square Edge (CD Grade)	Flooring (CD Grade)	Roofing (DD Grade)
Product Description	CD face grade sheets are available in a range of thicknesses and size	Solid sanded C grade surface with tongue and groove profile on long edges	Unfilled D grade surface with tongue and groove profile on long edges
Recommended Applications	Substrate for flexible coverings requiring a smooth substrate and where avoidance of visible surface indentations is critical. Use as a substrate for flexible roof and deck membranes and thin roofing tiles		Substrate for coverings with the ability to span holes in the D face grade (up to 75 mm in diameter) such as asphaltic roof tiles and torch welded polyester reinforce membranes. Do not use under flexible membrane coverings or where avoidance of visible surface indentation is critical
Face Grades	Front: C solid sanded Back: D unsanded		Front & Back: D unsanded
	Refer to Table 1 for range and treatment options		
Product Features	Blocking required to support all edges	Second void free layer under surface veneer for increased protection against punching through the first veneer under high point loads & increased moisture resistance. Blocking not required to support tongue and groove edges (unless otherwise specified)	15 and 17 mm thickness specifically designed for use under shingles and tiles that have a courser finish. Unsanded surface for extra strength and grip for installers on steep roofs Blocking not required to support[2] tongue and groove edges (unless otherwise specified)
Thicknesses Available	12, 15, 17, 19, 21, 25 mm	15, 17, 19, 21, 25 mm	15, 17 mm
Sheet Sizes Available	2400/2700 x 1200m		
Stress Grades Available	F8 (F11[1] available upon request)	F8 (F11[1] available upon request) 19 mm Longspan supplied F11[1] as standard	F11[1]
Treatment	Untreated, H3.2 CCA and H3.1 LOSP	Untreated, H3.2 CCA, (H3.1 LOSP available upon request)	
Span Capabilities	Refer to frame spacings in Tables 15A to 15C		

1 Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain.

2 Where roofing products use tongue and groove CHH Woodproducts recommends fastening the tongue to rafters/joists at a minimum of one point

4.4 FRAME SPACINGS FOR ECOPLY® ROOFS AND DECKS

Table 15A: Roofing - Sheathing, Non Trafficable, Above 2 Degree Pitch

Application	Roof Pitch	Stress Grade	Maximum Wind Zone	Maximum frame centres (mm) for Ecoply® with face grain across framing				
				Ecoply nominal thickness (mm)				
				15	17	19	21	25
Sheathing, non trafficable roof for all roof pitches above 2 degrees Suitable for roof mass up to 30 kg/m² (additional to Ecoply weight or 40 kg/m² including Ecoply)	>2°	F8	Extra High	600	600	800	800	900
		F11	High	900	900			
			Very High	800	900			
			Extra High	800	800			
	>20°	F11	Very High	900	900			
			Extra High	800	800			

Suggested applications include substrates for Asphalt Shingle and Membrane type roofs. The above suggested maximum framing spans are based on the following deflection criteria:

- Under a short term 1kN point load, deflection is less than Span/130
- Under a long term self weight load, deflection is less than Span/400
- Under a short term wind gust load, deflection is less than Span/150

Table 15B: Sub-Sheathing

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing					
	Ecoply nominal thickness (mm)					
	12	15	17	19	21	25
Under steel or self supporting cladding for support of building paper or lateral diaphragm action. Sag not critical.	800	1200				

Table 15C: Decking

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing			
	Ecoply nominal thickness (mm)			
	17	19	21	25
1. Trafficable roof decking Limited by dynamic response of roof as floor	540	600	600	750
2. Roof decking to Clause 8.5.5.1 c) of E2/AS1	400	400	400	400

- The current requirement in E2/AS1 is extremely conservative when compared with calculations determined for other applications using VM1 Clause 6 and calibrating the spans against codes of practice from North America and Australia. CHH Woodproducts recommends designers consider the alternative solution in row 1 of Table 15C for membrane decking in consultation with the membrane manufacturer.

  Unless otherwise stated spans apply equally to square edge or tongue and groove panels. Check Table 1 for availability of grades and lengths to match span multiples in Table 16
- Use the next lower recommended frame spacing or thicker Ecoply® where appearance is critical
- To suit trusses at 900 centres, 2700 long sheets are available. See Table 16

Table 16: Frame Set Outs to Match 2400mm and 2700mm Sheet Modules

Length (mm)	Typical Frame Spacing to Suit Sheet Length			
2400	400	480	600	800
2700	450	540	675	900

Limitation for the use of Table 16.

CHH Woodproducts does not have access to information about designs for specific sites. Table 16 is a guide to estimate the initial selection of a span for design. Each site should be evaluated by qualified persons to ensure all loading parameters and site conditions have been considered, and appropriate changes should be made by the building designer.

4.5 ROOFING – DESIGN CONSIDERATIONS

Durability

In general, H3.2 CCA treatment of Ecoply plywood with waterborne preservatives is recommended for roofing.

Roofing materials

Various roofing materials used over Ecoply plywood have different durability expectations, normally in excess of the 15 years required by the NZBC Clause B2. Durability of the roofing is subject to the specifications, installation and maintenance requirements of the roofing manufacturer. The durability of the Ecoply can only be assured as long as the overlying roofing and detailing excludes moisture. With good building practice and maintenance, roofing materials can be repaired or replaced at regular intervals to achieve life from the Ecoply in excess of the original roofing. The durability of Ecoply structural plywood will continue to satisfy the relevant requirements of the NZBC for 50 years, if installed in accordance with the instructions and limitations within this guide and the roof system is adequately maintained.

High humidity, condensation and solar driven moisture

Where the moisture content of wood may exceed 18% for prolonged periods, Ecoply must be H3.2 CCA treated, to resist decay hazard. This includes Ecoply used under roof coverings that may be subject to condensation, or where rain moisture soaked in the roof covering can be driven into the Ecoply by the sun. Appropriate building detailing and ventilation is recommended which can reduce the need for treatment.

Roof ventilation

Good ventilation and the avoidance of moisture are important design considerations when using H3.2 CCA treated Ecoply panels. Poorly ventilated spaces can develop very high temperature and moisture levels. The most likely source of moisture is the condensation of vapour from warm interior air on the underside of cold roofing. Good ventilation can limit the build up of excess moisture vapour in warmer climates but in regions where winter nights are consistently colder, H3.2 CCA treated Ecoply should be used. Moisture induced decay is only one risk that needs to be managed. If incorrectly detailed, roof spaces can be very tight and the dark colour of many roofing materials means that excessive heat can build up causing distortion in plywood or even framing members. Use the suggested details or alternatives to suit. Designers must consider roofing type, seasonal conditions, wind effects and the intended use of the building.

As a minimum, CHH Woodproducts recommends a vent area of 1/300th of the ceiling plan area (approx 3350 mm^2 per square metre of ceiling) equally distributed at the eaves and ridge to allow free flow under the Ecoply, up the roof slope, and out.

Roofing material suppliers should detail vent systems suited to their specific membrane or tile roofing. Proprietary ridge capping profiles or vents are available from roofing suppliers.

Detail gaps of 25 mm in the plywood at ridges, and at walls where a roof slopes up to an upper storey. For flat roofs, natural ventilation flows may be impeded. Use proprietary roof vents. Consider forced ventilation as appropriate.

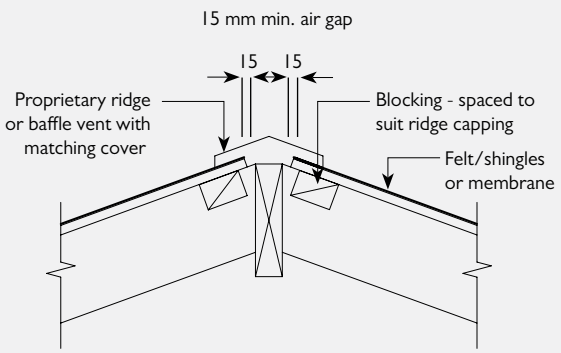
Bubbling

Plywood bubbling occurs when moisture trapped in knot holes in inner veneers expands as the temperature rises. This moisture will dissipate through the face veneer and will not affect the structural integrity of the plywood panel. As membrane coverings can prevent moisture dissipation, Ecoply Flooring and Structural Square Edge CD is recommended if the visual appearance of bubbling is not acceptable, or a high visual finish is required.

Soil

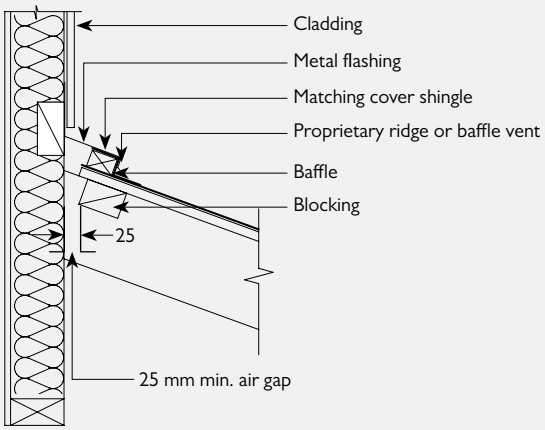
Ecoply plywood (untreated or H3.1 LOSP/H3.2 CCA treated) must not be allowed to come in contact with soil. Surfaces, flashings and gutters should be detailed to avoid trapping detritus and moisture.

EC003: Ridge detail with ridgeboard

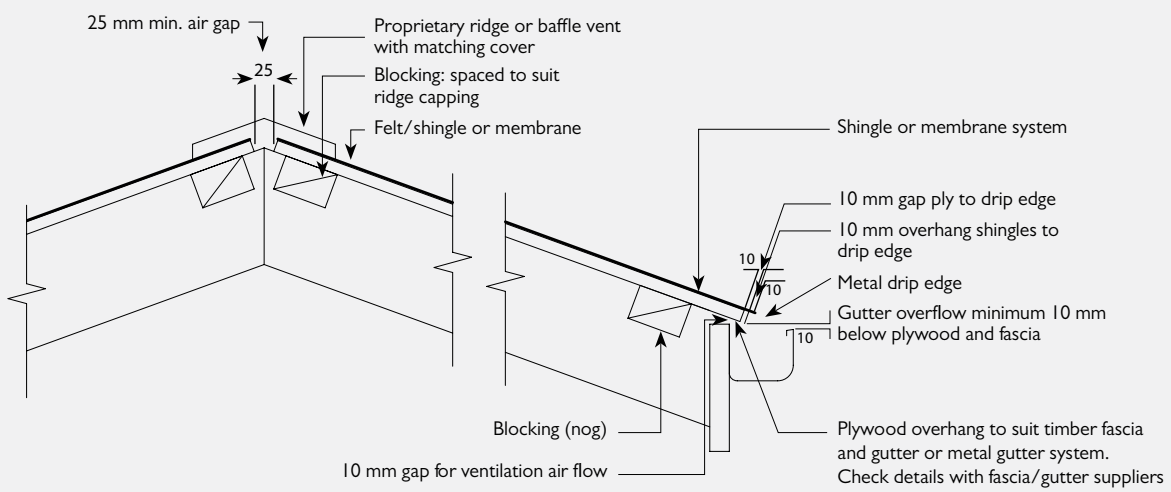


(use also with Hip Rafter if extra ventilation required)

EC004: Roof to wall junction vent



EC005: Truss ridge detail



Rain wetting and construction time

Untreated Ecoply will withstand a reasonable amount of rain wetting and exposure during construction for up to three months. In extreme weather conditions of high temperature and/or high rainfall this period may be less. Appearance issues such as discolouration and face checking of the sheet surface can be expected if Ecoply is exposed. For roofs uncovered for longer periods use H3 treated Ecoply to lower the risk of decay. Return Ecoply to below 18% moisture content before installing moisture sensitive materials, coverings, coatings or adhesives. Where a high visual finish is desired (such as membrane roofing and decking) protect Ecoply from exterior moisture during construction. For detailed information see section 4.1 Flexible Membrane Systems.

Gutter details

Where Ecoply structural plywood sub-sheathing supports roofing at gutters, a metal drip edge must be provided with appropriate gaps to shed water. Gutters should have a front edge overflow or ends lower than the back to shed water overflow away from framing and sub-sheathing Ecoply.

H3.2 CCA treatment is recommended for Ecoply sheets that protrude into gutters, with regular maintenance to avoid leaf mould (soil) development. Untreated Ecoply must not be exposed to gutter splash or moisture.

Fastener spacing for wind suction

Wind pressure applies withdrawal loads to nails holding plywood to purlins and trusses. For the frame spacing in Table 15A designers may use the following guidelines for wind zones expressed in NZS 3604.

Note: Full penetration of fasteners into the supporting member is assumed.

The main body of the roof

For wind zones up to and including high, use 60 x 2.8 mm nails spaced at 150 mm centres on all cross framing. For very high and extra high wind zones, use 75 x 3.15 mm nails spaced at 150 mm centres on all cross framing.

Roof edges

All Ecoply structural plywood used at local pressure suction zones at the roof edges, gutters, eaves and gable ends must be supported on framing, and fixed at 75 mm centres with minimum 60 x 2.8 mm nails for regions up to, and including high wind zones (use 75 x 3.15 mm nails for very high and extra high wind zones). Local pressure zones are interpreted from AS/NZS 1170 as being within 20% of the building length, width or the average of the gutter and ridge height.

Designers and builders should review site conditions to ensure adequate fixing is applied. Buildings in exposed sites and lee zones should be specifically designed using the loading standard (AS/NZS 1170) and the timber structures standard NZS 3603. In some wind conditions, the tiles themselves may be sucked from the plywood. Use a consulting engineer to assess site conditions, calculate wind pressures for the specific site, and determine the fastening and span requirements, and to check that the truss system can resist the loads being applied through the plywood.

Fixing of roofing

Fixing methods for tile, shingle and membrane systems must be designed for the expected wind and weather exposure to protect the Ecoply substrate. Some shingle systems may not be suitable for use in very high or cyclonic wind zones.

Follow the specifications of the roofing manufacturer and refer to the appropriate BRANZ Appraisals.

4.6 ROOFING – INSTALLATION

Framing

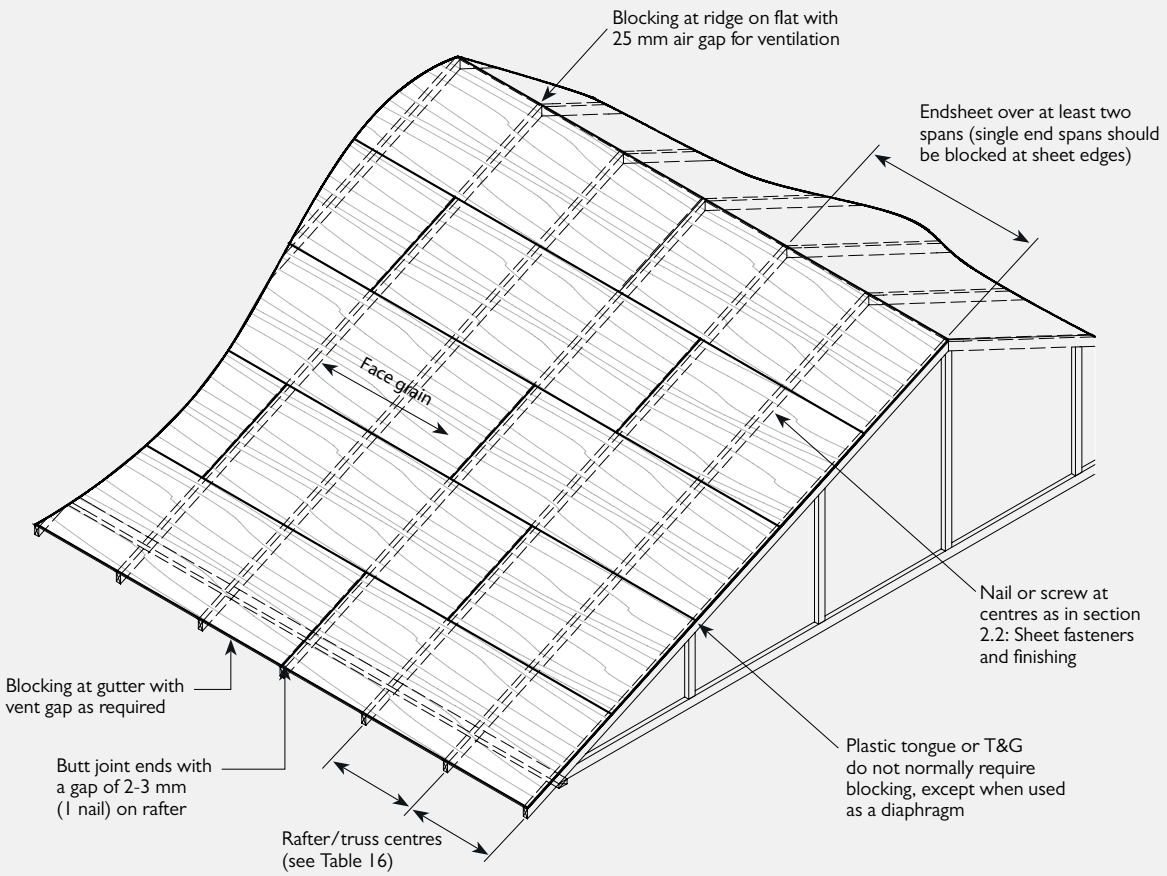
Frames should be at spacings to suit plywood thicknesses in Table 15A, page 25. Additional requirements for roof framing are:

- Ensure top edges of framing are properly aligned
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to lower moisture level in roof spaces, second floor spaces, and reduce differential truss, rafter or joist deflections

Blocking (nogs, dwangs)

- Block all edges of Ecoply Structural Square Edge plywood
- Block all edges at the ridge and gutter lines to prevent sag at capping or gutters
- Block for high face loads or under areas accessed for maintenance
- Blocking within the body of the roof is not required under tongue and grooved edges when using Ecoply Flooring & Roofing, unless required for framing stability or the plywood is being used as a diaphragm to resist horizontal wind or earthquake loads. In this case fixings transfer shear across the joints and details should be specified on drawings
- Use blocking on the flat to provide gaps where air flow is needed for ventilation
- Specific roofing suppliers may require blocking to suit their system

EC006: Sheet and framing layout



Sheet layout

- Ensure Ecoply sheets are dry before installation
- Place face grain at right angles to supports
- Sheets must be continuous over at least two spans (three framing members)
- Lay the sheets in a staggered pattern
- Allow sufficient clearance inside confining structure such as concrete or brick walls adjacent to the roof. Use extra allowances with large areas
- Allow clearance for ventilation as required

Fixing of sheets

Ecoply may be fixed to different types of framing with nails, screws or a combination of fasteners and construction adhesives.

Fasteners should be corrosion resistant to a level appropriate to the end use life expectancy (15 or 50 years) and expected exposure to moisture. Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

The integrity of a plywood based roof system is directly related to how well the panels are fixed to the framing. Ecoply must be fixed to resist wind suction loads, and to maintain surface qualities of the overlying roof covering.

- Always refer to the roofing system supplier for system requirements
- For roofing, check the additional requirements according to wind exposure
- For very exposed sites, cyclonic conditions or roofs above 10 metres in height, carry out specific structural design to the relevant standards
- Screw fixing must be used for membrane roofing, and is preferred for all systems because of increased holding power and avoidance of head popping
- For minimum fastener spacing for wind suction, refer section 4.5 Roofing - Design Considerations - Fastener spacing for wind suction

Fixing to timber frames

- Ring shank nails or annular grooved nails or screws are recommended for additional holding power
- Use flathead nails. Do not use jolt or bullet head nails
- Stainless steel nails must be annular grooved
- Ensure fastener is compatible with the roofing cover (consult roofing system supplier)
- Staples may be used provided that the withdrawal load is equivalent to the hand driven galvanised flathead nail. A suggested minimum is a 50 mm long staple with 12 mm crown and legs 1.8 mm diameter. Space staples 20% closer than nails. Refer to the manufacturer's information for corrosion resistance and durability

Fixing to steel frames

- Fix directly to roll formed steel (up to 2 mm thick) with self-drilling, self-tapping screws. If plywood gets damp and expands, screws in thicker steel may shear. Keep Ecoply dry or use larger screws or;
- Bolt or screw battens to the steel and apply Ecoply as above for timber. Ensure that battens have adequate thickness for the minimum nail or screw length
- H3.2 CCA treated plywood must not be fixed to steel framing

5.0 FLOORING

The following section covers the use of Ecoply Flooring plywood used as a flooring substrate with flexible and rigid overlays. Ecoply Flooring is suitable as a substrate for overlays such as carpet, tiles and some membrane products (refer to flooring manufacturer).

5.1 FLOORING – RANGE

- Ecoply Flooring features a void free second layer under the surface veneer for increased protection against moisture bubbles and punch through of the first veneer under high point loads than normal Ecoply Structural Square Edge plywood
- The tongue and groove on long sheet edges does not require support blocking under the joint (unless otherwise specified)
- Supplied in F8 stress grade (F11 available upon request)
- Ecoply 19 mm Longspan Flooring supplied as standard in F11/F8 stress grade
- Supplied standard with a sanded C grade surface with D grade back
- Sanded B grade surface is available in 19 mm thickness (untreated only) for clear finish applications. Designers must expect the surface to dent or mark more easily than hardwood flooring systems as Ecoply is manufactured from relatively soft radiata pine.
- Available untreated or H3.2 CCA treated, (H3.1 LOSP treated available upon request)
- LOSP treated plywood is not recommended for internal applications
- Refer to Table 1 for range and treatment options

5.2 FLOORING – INSTALLATION

Table 17: Flooring Frame Spacings

Application	Maximum frame centres (mm) for Ecoply® with face grain across framing				
	Ecoply nominal thickness (mm)				
	15	17	19	21	25
1. Domestic flooring 2kPa - 1.8kN	480	540	600 F11[1] Longspan	600	750
2. Institutional and public assembly up to 4kPa - 2.7kN		300	480	540	750
3. Institutional and crowd assembly up to 5kPa - 3.6kN			400	450	600
4. Corridors, industrial up to 5kPa - 4.5kN			300	400	540
5. Domestic garage floor** 2.5kPa - 9kN					270

** Provide blocking to all edges of the sheet.

- Use the next lower recommended frame spacing or thicker Ecoply flooring where appearance is critical
- To suit frames at 900 centres, 2700 long sheets are available. See Table 16

[1] Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain. Please contact CHH Woodproducts for Span/360 deflection limits for internal membrane areas

Floor loads

For domestic garage floors blocking is required under all edges to control wheel loads on the tongue. Testing with 113 mm diameter load head (0.01 m^2) confirms commercial floor capabilities.

Refer to Table 16 to match frame set outs with 2400 mm and 700 mm sheet modules.

Framing

- Joist spacings should be at spacings to suit plywood thicknesses in Table 17
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to achieve a moisture content of 18% or less

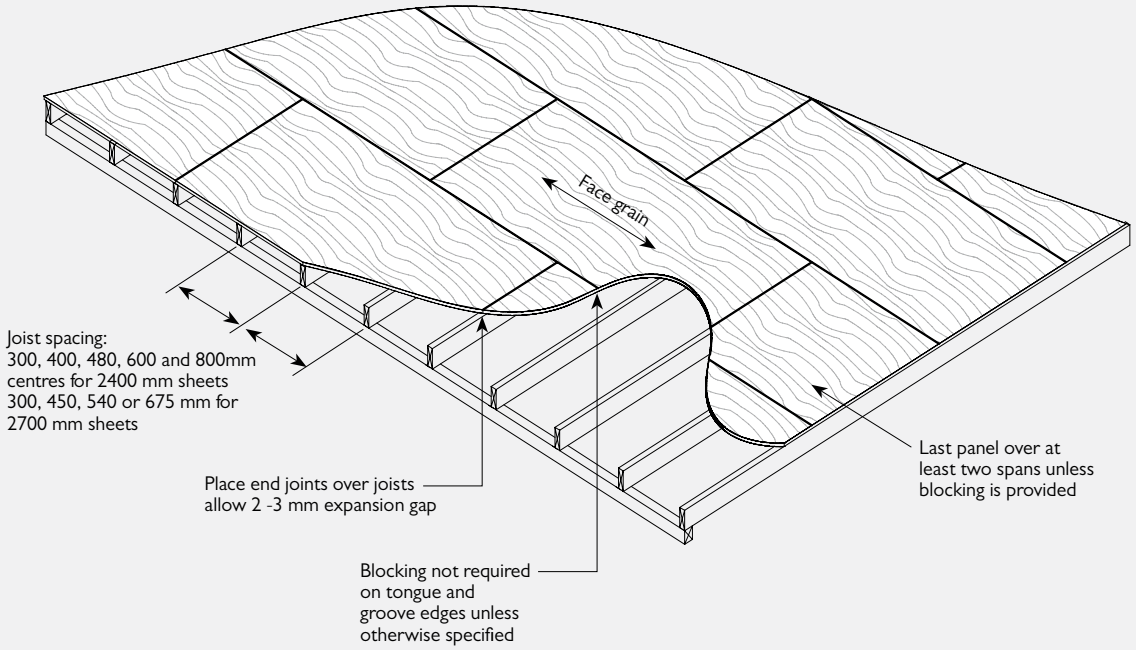
Blocking

- Blocking within the body of the floor is not required under tongue and groove edges unless otherwise specified (such as in domestic garage floors)

Sheet layout

- Ensure Ecoply sheets are dry before installation
- Place face grain at right angles to supports
- Sheets must be continuous over at least two spans (three framing members)
- For panels at floor edges where a continuous two span coverage is not possible, sheet edges must be supported by blocking
- Lay sheets in a staggered pattern
- Allow clearance for ventilation as required

EC007: Ecoply® Flooring layout



Fastener selection and treatment

Fasteners should be corrosion resistant to a level appropriate to the end use, life expectancy (15 or 50 years) and expected exposure to moisture.

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Fasteners and fixing of sheets

- Ecoply Flooring may be fixed with nails or screws or a combination of mechanical fasteners and construction adhesives
- For fastener specifications (including lay out and sizes) refer to section 2.2: Sheet Fasteners and Fixing
- For construction adhesive specifications refer to section 2.3: Adhesives
- Ring shank or annular grooved nails, or screws are recommended for additional holding power
- To reduce the risk of fastener popping or floor squeak the use of construction adhesives is advised.
- Do not use jolt or bullet head nails

5.3 FLOORING – FINISHING

- Overlays and coatings should be applied following the manufacturer's specifications
- Avoid heavy sanding that may remove the critically important structural face veneer
- Adhesives must be compatible with CCA (Copper Chrome Arsenic) treatment in H3.2 CCA treated sheets. Compatibility can often be improved by lightly washing, scrubbing and drying the plywood surface prior to fixing
- Where clear or stained finishes are desired, designers should select sheets and protect the floor as much as possible from the weather and construction activities
- Ecoply is made from relatively soft radiata pine and as such will dent or mark more easily than hardwood flooring systems. This is to be expected and designers must consider the long term appearance requirements of the project. Ecoply Flooring is a good substrate for harder wearing flooring overlays, and is not primarily intended for clear finishing, especially if it is exposed to moisture during construction
- For improved surface finish, floors should be protected from weather during construction as soon as possible

6.0 FREQUENTLY ASKED QUESTIONS

Q: How much space should be allowed for expansion?
A: Allow a 2 - 3mm expansion gap between square edges of Ecoply® sheets. If using Ecoply Flooring, a 5 mm expansion gap is recommended at the perimeter of the floor or deck. Check by calculation for large areas.

Q: Can power driven nails be used to fix Ecoply?
A: Paslode power driven nails have been tested for fixing Ecoply and Shadowclad® plywood products for particular bracing and cladding applications. For power driven nail specifications refer to the Paslode Special Fixing Applications document available from http://www.paslode.co.nz/images/fix-app-CHH-woodproducts.pdf. Use the Paslode Impulse Compact Nailer fitted with a No Mar(k) work contact element to eliminate any contact marks on the plywood. Adjust the work contact element to the flush position and fire the nail at 90° to the work surface. Hammer any nails flush which are left proud. Do not overdrive.

Q: How close to sheet edges can I nail?
A: Fixings must be at least 3 fastener diameters or 7 mm from the sheet edge.

Q: Do I have to use stainless steel nails when using Ecoply for bracing?
A: Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances.Where stainless steel nails are required, annular grooved nails must be used.

Q: What is the weight of Ecoply?
A: Refer to Table 4A for weight (kg/m^2) of different Ecoply thicknesses.

Q: What is the R-value of Ecoply?
A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (k) of 0.13 W/mK so a 12 mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Q: Are there any compatibility issues when using Ecoply with other materials?
A: Adhesives for flexible rubber membranes may react with LOSP treatment and should therefore only be applied to H3.2 CCA treated Ecoply unless the membrane supplier advises differently. Check with the membrane manufacturer if in doubt. H3.2 CCA treatment is also corrosive and this must be taken into account when specifying H3.2 CCA treated plywood next to metals. For further guidance, refer to Tables 21 and 22 in Acceptable Solution E2/AS1.

Q: Can Ecoply be used as a rigid sheathing (air barrier)?
A: CHH has a specific system called Ecoply Barrier. Ecoply Barrier has been developed as a rigid air barrier. Refer to the current Ecoply Barrier Specification & Installation Guide for further information. 7mm H3.2 CCA treated Ecoply can also be used if combined with building underlay in accordance with E2/AS1 for a rigid air barrier system.

Q: What is the relevance of AS/NZS 2269?
A: Ecoply structural plywood is manufactured to AS/NZS 2269 Plywood Structural. This Standard is referenced by the NZBC Compliance Documents including NZS 3602 Timber and Wood-based Products for Use in Building, NZS 3603 Timber Structures, NZS 3604 Timber Framed Buildings, AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood and Acceptable Solution E2/AS1 - External Moisture. Plywood not manufactured to AS/NZS 2269 does NOT meet the requirements of these NZBC Compliance Documents.

Q: What is the relevance of the PAA stamp?
A: Ecoply is manufactured under a third party audited, product quality control programme by the Engineered Wood Products Association of Australasia (EWPAA) to monitor compliance with AS/NZS 2269. Given that compliance with Standards is not actively policed by Standards New Zealand, this third party auditing provides important peace of mind for users and consumers of Ecoply plywood products.

Q: What is marine ply?
A: Marine plywood manufactured to AS/NZS 2272 Plywood Marine may contain species of low durability (source: BRANZ Good Practice Guide – Timber Cladding). Whilst marine plywood has a Type A glue bond, it is generally specified for its high surface appearance grade and lack of core knots as opposed to structural performance. AS/NZS 2272 limits marine plywood to a number of approved species that pass stringent property requirements for things like moisture permeability. These requirements are different from those in standards from other countries. Marine plywood is rarely treated as it is usually coated with resin, fibreglass, or a paint finish for long term durability.

Q: What should a specification for structural plywood include?
A: A specification for structural plywood should include:

Specification check list	Example
Quantity/size	20 sheets of 2400 x 1200
Thickness	12 mm
Edge finish	Square edge
Brand name	Ecoply® structural plywood
Reference to Standard	To AS/NZS 2269
Stress grade[1]/layup	F8 (12-24-5)
Surface grade/bond type	CD A-Bond[2]
Accreditation	EWPAA product certified[3]

1 Stress grades may vary between different manufacturers and products.
2 Type A-bonds are suitable for permanent exposed applications and structural applications.
3 The EWPAA JAS-ANZ Product Certification Mark certifies that Ecoply structural plywood products have been manufactured under a third party audited joint product certification programme to monitor compliance with AS/NZS 2269

Q: What are F-grades?

A: The stress grading system is a ranking system which utilises the symbol F and a suffix 8, 11 etc as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. For plywood of a given thickness, the higher the F-grade, the further it will span. For load bearing applications (e.g. flooring, roofing) the required F-grade as well as the plywood thickness must be specified to achieve the required span. F8 is the most common structural plywood grade found in New Zealand. All Ecoply® structural products are F8. Ecoply 15 mm roofing and Ecoply 19 mm Longspan Flooring are F11/F8. Other Ecoply Flooring products are also available in F11 upon request.

Q: What are surface/appearance grades (eg CD)?

A: Appearance grades (eg BD, CD, DD) denote the appearance grade of the plywood including the number and size of knot holes as defined in AS/NZS 2269 and summarised in Table 2A & 2B of this guide. The first letter describes the appearance of the face veneer and the second letter describes the back face.

Q: How long can Ecoply be left exposed to the weather?

A: Untreated Ecoply will typically maintain its structural integrity when exposed to the weather during construction for up to 3 months. The surface colour will start to silver off and face checking will become evident. Where the finished appearance of the Ecoply is important, it should be protected during construction. Ecoply is also available H3 treated to resist decay or insect hazard. When used in accordance with this guide, it can be specified to meet the durability requirements of the NZBC, however appearance issues such as face checking may still occur dependent upon the degree of exposure to weather during construction.

Q: What treatment levels and types are used for Ecoply?

A: Ecoply is available untreated or preservative treated. Ecoply is treated to the H3 hazard class for above ground use. The standard Ecoply treatment type is H3.2 CCA (Copper Chrome Arsenate) although H3.1 LOSP Azole (Light Organic Solvent Preservative) may also be specified where a clear treatment is required. LOSP Azole is the standard treatment type for BD, Grooved Lining and Shadowclad®. CCA treatment gives the plywood sheets a green tinge and the drying process after CCA treatment may leave fillet marks on the face of the sheet.

Q: Does Ecoply have to be treated when used as structural bracing?

A: Ecoply used as bracing must be treated unless it is installed in an interior dry situation. Note, behind exterior cladding and in cavities (even if the Ecoply is covered with building wrap) are not considered to be an interior dry situation.

Q: Do I have to re-treat cut edges of treated Ecoply?

A: It is important to re-treat any cuts and holes with a brush on remedial treatment such as Holdfast® Metalex® Clear.

Q: What type of glue is used to manufacture Ecoply?

A: Phenol formaldehyde (PF) resins are used to bond the plywood veneers. This forms a Type A (Marine) bond suitable for structural applications and exterior use. Phenol formaldehyde resins are dark red/brown in colour. Product details printed on the back of Ecoply sheets indicate the 'A Bond'.

Q: Does Ecoply emit formaldehyde?

A: Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply and Shadowclad meets the lowest formaldehyde emission class (E_0 - less than 0.5 mg/litre). Actual formaldehyde emissions have been tested to be less than 0.3 mg/litre.

Q: How should Ecoply be installed to maximise its stiffness properties?

A: Structural plywood has greatest stiffness along the long grain of the sheet (i.e. along its length). Therefore, flooring/roofing should be laid across joists/rafters rather than parallel to them.

7.0 REFERENCES AND SOURCES OF INFORMATION

- New Zealand Building Code (NZBC)
- CHH Woodproducts technical notes - downloadable from www.chhwoodproducts.co.nz/document-library
- NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber"
- NZS 3602:2003 "Timber and Wood-based products for use in Buildings"
- NZS 3603:1993 "Timber Structures Standard"
- NZS 3604:2011 "Timber Framed Buildings"
- AS/NZS 1170:2011 "Structural design actions"
- AS/NZS 2269:2012 "Plywood Structural"
- AS/NZS 1604.3:2010 "Specification for Preservative Treatment, Part 3: Plywood"
- AS 1684:2010 "Residential Timber Framed Construction"
- US Product Standard PS1-95
- Acceptable Solution 'E2/AS1 – External Moisture'
- Acceptable Solution 'B2/AS1 – Durability'
- BRANZ Bulletin 345: Flat membrane roofs – design and installation
- BRANZ Bulletin 346: Flat membrane roofs – materials
- BRANZ Bulletin 289: Asphalt shingle roofing
- BRANZ Appraisals 307, 404, 411
- Shadowclad® Specification & Installation Guide for Cavity Construction
- Ecoply® Barrier Specification & Installation Guide
- Material Safety Data Sheets
  - MSDS Azole Treated Plywood, LVL & I-Joists
  - MSDS H3 CCA Treated Plywood & I-Joist
  - MSDS Untreated Plywood
- APA (www.buildabetterhome.org)
- EWPAA (www.ewp.asn.au)
- Product Technical Statement for Ecoply available online (www.chhwoodproducts.co.nz/product-technical-statements)
- EWPAA Technical Note - Plywood Roofing and Flooring: Installation and detail factors

Standards can be purchased online at www.standards.co.nz
Building Code Compliance Documents can be downloaded free of charge at www.dbh.govt.nz

8.0 LIMITATIONS

The information contained in this document is current as at September 2015 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply products installed in accordance with this document or NZBC compliance documents.

This publication replaces all previous CHH Woodproducts design information and literature relating to Ecoply structural plywood products. CHH Woodproducts reserves the right to change the information contained in this document without prior notice.

It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Woodproducts assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

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Proven. Durable. Strong

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September 2015

JAS-ANZ

PRODUCT CERTIFIED paa ENGINEERED WOOD

ewpaa

NEW ZEALAND MANUFACTURED

H1 CALCS

NZBC H1 - Calculation Method

Client	Bunn
Address	Lot 460 Hoffman St
	Christchurch

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	127.32	3.30	38.58	
Roof Type 2	Trimed Insulation area	11.16	3.30	3.38	
Wall Type 1	70% Total Wall Area	106.65	2.00	53.32	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	100mm slab on ground	138.48	1.30	106.52	
Glazing (30%)	Double Glazed Std Alu Frame	45.71	0.26	175.79	
Glazing (>30%)	Double Glazed Std Alu Frame	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.31	0.00	
				377.60	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	127.32	3.32	38.35	
Roof Type 2	Trimed Insulation area	11.16	2.07	5.39	
Wall Type 1	70 Series Brick veneer	119.34	2.23	53.52	
Wall Type 2	Linea Weatherbds 20mm cavity	2.21	2.24	0.99	
Wall Type 3		0.00	1.00	0.00	
Floor	100mm slab on ground	138.48	1.28	108.19	
Glazing (30%)	Double Glazed Std Alu Frame	30.80	0.26	118.46	
Glazing (>30%)	Double Glazed Std Alu Frame	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.31	0.00	
				324.89	TOTAL LOSS

Component	Description	Area sq m	
Wall Type	Total Area East, South & West	112.02	
Glazing (30%)	Total Area East, South & West	11.82	10.55%

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ◉
Walls ○
Roofs ○

Date: 30/09/2020

Element Name (optional) **1.28** m²°C/W

Type: Floor: Slab Floor

Slab Floor [view detail]

internal surface 0.09

Flooring : none (Example: polished surface of a concrete floor)

R-value: 0.00

Slab Insulation

Slab floor area [m²]:	138.4		
Perimeter length [m]:	62.06		
External wall thickness [mm]:	90		
Soil conductivity [W/m °C]	1.2		
Underslab insulation:	none	Insulation :	
Piles Footings:	Number:	Penetration Diameter [mm]:	
Slab edge insulation:	none	Insulation :	

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ◉
- Roofs ○

Element Name (optional) — **2.24** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : James Hardie Linea weatherboard
R-value: 0.08

Air Barrier : 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*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

H1 compliance calculator, now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the new Design Navigator message board.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Floors ○
Walls ◉
Roofs ○

Wall: Veneer wall with timber framing and bulk insulation (vented)

external surface 0.03

Veneer: 70mm brick
R-value: 0.06

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Air Barrier: Building paper
R-value: 0.01

Timber Frame & Cavity: 90mm, studs @ 600mm, dwangs @ 800mm

Frame Area: 15.1% *Cavity Area: 84.9%*

Timber Frame
R-value: 0.75

Insulation: 2.6

still Airgap: 20-90mm airgap (non-reflective)
R-value: 0.16

Wall Lining: Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

Resulting R-value: 2.23 m²K/W.

Print Page

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 30/09/2020

Element Name (optional) — **3.32** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : 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%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 127.3 Number of downlights: 27 Clearance from lamp holder side [m]:

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 30/09/2020

Element Name (optional) **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : 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%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 11.16 Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid contruction):

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

RISK MATRIX

NZBC E2 - Risk Matrix	
Client	Lyn Bunn
Address	Lot 460
	Christchurch

Risk Factor	Low	Medium	High	Very H	Score	Select
Wind Zone	0	0	1	2	**1**	Wind High
No. of Storeys	0	1	2	4	**0**	1 Storey
Roof / Wall	0	1	3	5	**3**	Roof/Wall High
Eaves Width	0	1	2	5	**0**	Eaves Low
Envelope	0	1	3	6	**3**	Envelope High
Decks/Balcony	0	2	4	6	**0**	Deck/Balcony Low
			Total Score		**7**	

Note: Claddings in Extra High Wind Zones require Rigid Underlays & Drained Cavities.
Scores are the same as Very High Wind Zone

	Cladding	Cavity	Risk Score
North Elevation	Masonary	Drained Cavity	7
East Elevation	Bevel-back Weatherboards	Drained Cavity	7
South Elevation	Masonary	Drained Cavity	7
West Elevation	Masonary	Drained Cavity	7

Wind Zone	
Low Risk	NZS3604 Low Wind Zone
Medium Risk	NZS3604 Medium Wind Zone
High Risk	NZS3604 HIgh Wind Zone
Very High Risk	NZS3604 Very High Wind Zone
Extra High Risk	NZS3604 Extra HIgh Wind Zone

Number of Storeys	
Low Risk	One Storey
Medium Risk	Two Storey in part
High Risk	Two Storey
Very High Risk	More than Two Storeys

Roof / Wall Junctions	
Low Risk	Roof/wall intersections fully protected eg hip & gable roof with eaves
Medium Risk	Roof/wall intersections partly protected eg hip & gable roof no eaves
High Risk	Roof/Wall intersection fully exposed eg parapets, reverse slope eaves
Very High Risk	Roof elements finishing within wall clad eg lower ends of aprons, chimneys

Eaves Width	
Low Risk	Greater then 600mm at first level
Medium Risk	450-600mm at first level or greater than 600mm at second level
High Risk	100-450mm at first level or 450-600mm at second level
Very High Risk	0-100mm at first level or 100-450mm at second level of 450-600mm at third level

Envelope Complexity	
Low Risk	Simple rectangle, L, T or bommerang shape, single cladding
Medium Risk	Complex, angular or curved building shapes, single wall claddings
High Risk	Complex, angular or curved building shapes, multiple wall claddings
Very High Risk	As for High Risk but with junctions not covered in Table 1C or !F, box windows, pergolas

Decks & Balconies	
Low Risk	None or timber slatted deck or porch at ground level
Medium Risk	Fully roofed waterproof deck or timber slatted deck at 1sy or 2nd level
High Risk	1st level waterproof deck or 1st level cantilevered slatted deck
Very High Risk	2nd level waterproof deck or 2nd level cantilevered slatted deck

Suitable Wall Claddings		
Risk Score	**Direct Fix**	**Drained Cavity**
0 - 6	Timber Weatherboards Fibre Cement Weatherboards Vertical Profiled Metal - Corro or Trim Fibre Cement Sheet (Jointed) Plywood Sheet	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Fibre Cement Sheet (flush finish) EIFS
7 - 12	Bevel-backed Timber Weatherbds Vertical Timber Board & Batten Vertical Profiled Metal - Corro Only	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS
13 - 20	Vertical Profiled Metal - Corro Only	Masonry Stucco Horiz Profiled Metal - Corro/Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS Bevel-back Weatherboards
Over 20	Redesign Specific Design	

SOILS REPORT

New Zealand Institute of Architects Incorporated

ACENZ

Building Code Clause(s) B1

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: The Engineering Company Ltd (ENGCO)
(Design Firm)

TO: Rock Solid Foundations
(Owner/Developer)

TO BE SUPPLIED TO: Christchurch City Council
(Building Consent Authority)

IN RESPECT OF: Ribraft Slab
(Description of Building Work)

AT: Lot 460 Hoffman Street, Prestons Park,
(Address)

Town/City: Christchurch **LOT** 460 **DP** ..... **SO** .....
(Address)

We have been engaged by the owner/developer referred to above to provide:

Structural design of the Ribraft Floor Slab including the verification of the internal load bearing thickenings required specific to this design.
(Extent of Engagement)

services in respect of the requirements of Clause(s) B1 of the Building Code for:

☐ All or ■ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

■ Compliance Documents issued by the Ministry of Business, Innovation & Employment AS1/VM4 or
(verification method/acceptable solution)

☐ Alternative solution as per the attached schedule.....

The proposed building work covered by this producer statement is described on the drawings titled:

Engco: Bunn House, Lot 460 Hoffman Street, Prestons Park and numbered 20005.26/ S1-S6 (18.09.20);
together with the specification, and other documents set out in the schedule attached to this statement.

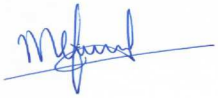
On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions Please see attached addendum
(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ■ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, Matthew Cusiel (Name of Design Professional) am: ■ CPEng 161509 # ☐ Reg Arch ..... #

I am a member of: ■ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE(hons),CMEngNZ,CPEng
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY Matthew Cusiel (Name of Design Professional) (Signature) 

ON BEHALF OF The Engineering Company Ltd (ENGCO) (Design Firm) Date 18.09.2020

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

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

ADDENDUM TO PRODUCER STATEMENT – PS1 – DESIGN

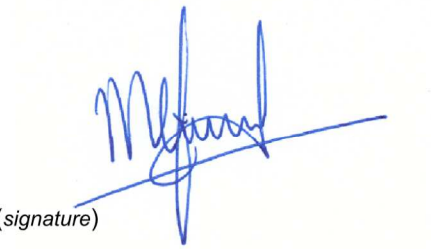
ISSUED BY:	The Engineering Company Ltd (ENGCO) *(Design Firm)*
TO BE SUPPLIED TO:	Christchurch City Council *(Building Consent Authority)*
IN RESPECT OF:	Ribraft Slab *(Description of Building Work)*
AT:	Lot 460 Hoffman Street, Prestons Park, Christchurch *(Address)*

The design has been verified in accordance with **AS1/VM4** of the approved Compliance Documents issued by the Department of Building & Housing and subject to:

i. The site is not subject to earthquake induced liquefaction settlements beyond MBIE Technical Classification 1 (TC1) limits.
ii. This slab has been designed in accordance with the recommendations of the Geotechnical Report by **Aurecon dated 21 August 2020, Ref: 235361**. The site shall be excavated to soils with consistent "Ultimate" bearing capacity of 200kPa. All filling shall be completed under the supervision of a suitably qualified person.
iii. Engco Consulting (*or its agent*) is responsible for conducting all pre-pour inspections required in order to issue a PS4 on completion in accordance with the attached inspection schedule.
iv. All proprietary products meeting their performance specification requirements;

I, M. Q. Cusiel, am a Chartered Professional Engineer, CPEng#161509, and am a Member of Engineering New Zealand. The Engineering Company Ltd holds a current policy of Professional Indemnity Insurance no less than $200,000*.

Signed by M. Q. Cusiel, BE(hons), CMEngNZ, CPEng, IntPE
on behalf of The Engineering Company Ltd, 2/596 Ferry Road, Woolston, Christchurch



(*signature*) Date: 18 September 2020

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

Schedule of Engineering Inspections	
Inspection Stage	**Purpose of Inspection**
Site stripping	Confirm all turfed soil stripped and bearing capacity is adequate
Ribraft Slab pre- pour	Once all reinforcing is placed and chaired

It is the contractor's responsibility to notify **The Engineering Company Ltd** 48 hours **(office@engco.co.nz)** before engineering inspections are required. The total number of inspections will depend upon the construction methodology and staging. Additional inspections from those listed above may be required upon conditions found on site. See also, local territorial authority requirements for construction monitoring.

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

THE BUILDING

Street address: Lot 460 Hoffman Street,	
Suburb: Prestons Park	
Town/City: Christchurch	Postcode:8083

THE OWNER

Name(s): Bunn

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, Matthew Cusiel 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
Primary structure			
Foundations and subfloor framing (✓)	*Design of Ribraft floor slab*	( ) Carried out (✓) Supervised	
Other (×)		( ) Carried out ( ) Supervised	

ISSUED BY

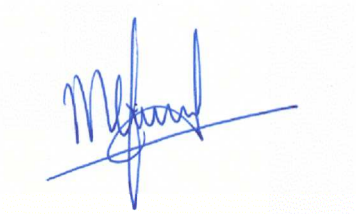
Name: Matthew Cusiel, CPEng	LBP or Registration number: 161509
The practitioner is a: ( ) Design LBP ( ) Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): The Engineering Company Ltd	
Mailing address (if different from below):	
Street address / Registered office: 2/596 Ferry Rd	
Suburb: Woolston	Town/City: Christchurch
PO Box/Private Bag:	Postcode: 8023
Phone number: 03 366 7955	Mobile:
After Hours:	Fax:
Email address: matt.cusiel@engco.co.nz	Website:

DECLARATION

I Matthew Cusiel [*name of practitioner*] , 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: 18 September 2020

aurecon

Prestons Park Subdivision

GEOTECHNICAL REPORT FOR LOT 460

CDL Land NZ Limited

21 August 2020

Revision: 1

Reference: 235361

Bringing ideas to life

Document control record

Document prepared by: James Muirson

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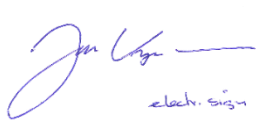
Document control						aurecon
Report title		GEOTECHNICAL REPORT FOR LOT 460				
Document ID			**Project number**		235361	
File path		P:\235361\069 Stage 2 Building Consent\Geotech\Building Consent Reports\Lot 460\235361 Building Consent Report Lot 460.docx				
Client		CDL Land NZ Limited				
Client contact		Jason Adams	**Client reference**			
Rev	**Date**	**Revision details/status**	**Author**	**Reviewer**	**Verifier** (if required)	**Approver**
0	20 October 2014	Draft for Review	J Muirson	J Muirson	J Kupec	T Browne
1	21 August 2020	Final for Issue	F Monteith	J Muirson		J Kupec
Current revision		**1**				

Approval			
Author signature		Approver signature	
Name	Fraser Monteith	Name	Dr Jan Kupec
Title	Engineering Geologist	Title	Technical Director

Contents

Appendices

1 Executive Summary

CDL Land NZ Ltd has commissioned Aurecon New Zealand Ltd to undertake site specific geotechnical investigations and assessments for individual residential lots for building consent purposes for the Prestons South Subdivision Stage 2. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the residential house on Lot 460 at the Prestons South Subdivision.

As part of the subdivision development extensive geotechnical testing, including cone penetration tests (CPTs), were carried out to define the liquefaction potential at the overall subdivision and to monitor the site works that have occurred. **Based on our information the property is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) set by the Ministry of Business, Innovation and Employment (MBIE) in their guidelines issued in December 2012.**

The site development has included extensive bulk earthworks. All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. The engineering sign off and bulk earthworks are documented in the Geotechnical Completion Report. The earthfill at the subdivision construction stage was placed and signed off in accordance with NZS4431:1989. Based on review of the available geotechnical information, including bulk earthworks information and NZS4431 compliance records, we consider that a determination in accordance with NZS3604:2011 Section 3.1.3 is appropriate and the property meets the requirements for NZS3604 type foundations.

The geotechnical site specific assessment comprised a review of previous geotechnical investigations undertaken for the subdivision development and a site specific geotechnical investigation. A single hand auger borehole was undertaken to assess the upper soil profile and groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot, one of the DCPs was located immediately adjacent to the hand auger borehole with the second DCP located on the opposite half of the lot.

Based on our knowledge of the site setting and our past work we recommend that any residential structure that is to be developed on Lot 460 be founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa, which for Lot 460 is achieved at a minimum depth of 0.4m below ground level as this represents the current thickness of the topsoil and loose soil.

This report shall be read as a whole. Our limitations are presented in Section 7.

2 Introduction

CDL Land NZ Ltd is currently undertaking a large residential subdivision with associated commercial lots. Previously Aurecon New Zealand Ltd has undertaken detailed geotechnical investigations and assessments for the purpose of the plan change, subdivision resource consent application, liquefaction assessment, technical classification of the entire subdivision, and observation of bulk earthworks construction.

Aurecon New Zealand Ltd has since been commissioned to undertake site specific geotechnical investigations and assessment of individual lots for building consent application purposes. The site which this report is focused on comprises a single lot, designated Lot 460 at the Prestons South Subdivision to the south of Prestons Road in Marshland, Christchurch. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the proposed house on the lot. We note that at the time of writing this report the location and structural form of the dwelling were unknown, and it is inferred to comprise NZS3604:2011 type residential buildings only.

This report shall be read as a whole. Our limitations are presented in Section 7.

3 Site Conditions

3.1 Site Description

The Prestons Subdivision is located on the northern fringes of Christchurch City. The site is made up of a series of adjacent properties forming an irregular and elongated rectangle shape, orientated approximately north to south. The total area of the overall Prestons Subdivision site is approximately 190ha. The site can be separated into two distinct blocks, Prestons North which runs from the Lower Styx Road in the north through to Prestons Road in the south and the Prestons South development which continues from Prestons Road through to Mairehau Road to the south.

This building consent report is for Lot 460 which is located in Stage 2 of the Prestons South Subdivision development (refer Figure 1 in Appendix A). The lot is bordered by residential lots to the north, west and south, with an access road to the east.

3.2 Surface Water

There are no natural sources of surface water on the subdivision.

3.3 Regional Geology

The geology of the site is described in the 1:250,000 scale geological map – '*Geology of the Christchurch Area*', published in 2008 by the Institute of Geological and Nuclear Sciences. Note this map has been referenced as it is at an appropriate scale and covers the entire site. The map indicates the underlying geology comprises '*Dominantly sand of fixed and semi-fixed dunes and beach deposits'* and '*drained peat swamp*'. The subdivision geotechnical investigation identified that this area was predominantly underlain by aeolian (dune) and beach sand deposits.

The GNS Active Fault System database (GNS, 2012a) indicates that the site is located approximately:

- 27km north east of the eastern end of the Greendale Fault System. Movement on the Greendale Fault System was responsible for the Magnitude 7.1 Darfield (Canterbury) Earthquake on 4 September 2010.
- 14km north of the epicentre of the Magnitude 6.2 Christchurch Earthquake on 22 February 2011.
- 12km north west of the Magnitude 6.0 earthquake on 13 June 2011 (GNS, 2012b).
- 8km north west of the Magnitude 5.9 earthquake on 23 December 2012.

3.4 Site Earthworks

Site earthworks have been undertaken to prepare the site for residential building purposes. The subsurface profile was stripped back and the site was built up with compacted engineered fill. During bulk earthworks shallow organic material, where encountered, was removed as part of the bulk earthworks.

All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. Details of the site bulk earthworks are provided in the Aurecon report titled '*Prestons Park Subdivision – Stages T6, T7 & U2 Geotechnical Completion Report Rev 0'* dated 13 August 2020. The Geotechnical Completion Report has been completed as part of the requirements of NZS4404:2010 '*Land development and subdivision infrastructure*' and Christchurch City Council '*Infrastructure Design Standards - Part 4: Geotechnical Requirements*'. The compacted fill was placed and signed off in accordance with NZS4431:1989 '*Code of practice for earth fill for residential development'*.

3.5 Technical Classification

The landcheck maps historically provided on The Canterbury Earthquake Recovery Authority (CERA) website indicated the site is classified as rural and unmapped. The technical categories were developed by the Ministry for Business, Innovation and Employment (MBIE) with the support from the Engineering Advisory Group (EAG) in mid-2011 and hence prior to the start of the subdivision development. The site has since been modified by civil engineering and bulk earthworks.

As part of the subdivision consent geotechnical assessment, site specific liquefaction assessment was carried out over the wider subdivision area. This is detailed in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013.

Based on the results from our liquefaction assessment and bulk earthworks undertaken on the wider subdivision, Lot 460 is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) in the MBIE Guidelines issued in December 2012.

4 Geotechnical Assessment

4.1 General

The geotechnical assessment comprised a review of relevant previous geotechnical investigations and construction data and an in-situ geotechnical investigation. The geotechnical investigation comprised hand held testing on the individual lot and a review of the previous geotechnical investigations undertaken for the subdivision within the vicinity of the lot. A single hand auger borehole was undertaken to assess the upper soil profile and the groundwater level. Two dynamic cone penetrometers (DCPs) were carried out on the lot. The hand held testing was undertaken on the lot following the site earthworks. The testing density is considered reasonable as the geotechnical project engineers were involved in the observation of the civil engineering works.

4.2 Previous Investigations

The previous geotechnical testing and investigations undertaken by Aurecon across the entire subdivision site comprised of a combination of cone penetrometer tests (CPT) and machine excavated test pits. Further details regarding these investigation locations are found in the Aurecon reports titled *'Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent',* Revision 2 dated 5 March 2012, *'Prestons Road Subdivision, Detailed Geotechnical Design Report',* Revision 2 dated 12 July 2012 and *'Prestons South Subdivision Resource Consent Geotechnical Report'*, Revision 1 dated 6 June 2013. In addition, testing carried out as part of the subdivision development is presented in the Aurecon Geotechnical Completion Report.

4.3 Hand Held Testing

One hand auger borehole was undertaken on the lot as part of the geotechnical investigation to assess the upper soil profile and the groundwater level. The test location and the borehole log have been uploaded to the New Zealand Geotechnical Database (NZGD). The borehole log is attached in Appendix B.

The hand auger borehole log indicates the upper soil profile consists of topsoil underlain by sand to the termination depth. The hand auger borehole was terminated when soil samples became saturated and the hole started to collapse.

The logging of the recovered hand auger samples was undertaken in accordance with the New Zealand Geotechnical Society's *"Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes: 2005".*

4.4 Dynamic Cone Penetrometers

Two DCPs were carried out with the locations and results uploaded to the NZGD. The DCP test results are attached in Appendix B. One of the DCPs was located adjacent to the hand auger borehole, with the second DCP located on the opposite half of the lot.

DCP logs indicate 5 blows per 100mm penetration, which is equivalent to an ultimate bearing capacity of 300kPa, was consistently encountered from a shallow depth.

4.5 Groundwater Levels

Groundwater levels were measured within the hand auger borehole at the time of the investigation and correlated to our site specific knowledge. An indicative groundwater level was noted where holes collapsed due to saturated soil. Groundwater was encountered at approximately 2.1m depth below ground level. It should be noted that groundwater levels may vary seasonally.

A review of the NZGD indicates that regional groundwater levels are likely to be in the order of 1m to 2m below ground level. These groundwater levels are reasonably consistent with those measured during the investigation, when taking into account the subdivision earthworks filling and cutting.

4.6 Topsoil Depth

The depth of topsoil has been determined from the single hand auger and two DCPs undertaken on site. We note that the topsoil depths may vary by +/- 100mm between the testing locations and hence it is recommended that at least a 100mm tolerance should be allowed for building foundation excavations.

If greater certainty of topsoil depths across the whole site is required for construction costing then further testing would be necessary across the footprint of the proposed structure (unknown at the time of writing this report). **The responsibility and liability for any additional testing shall be met by the section purchaser.**

5 Foundation Recommendations

The site is expected to perform in line with TC1 requirements in future earthquakes. Due to the residential land use of the development, the presence of certified fill and the TC1 technical classification, future residential development will be able to adopt standard NZS3604 compliant foundations.

5.1 Foundation Types

It is recommended that residential structures that are built on Lot 460 are founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa. The site investigation results indicate that approximately 350mm of topsoil was present, which will need to be removed and the clean subgrade exposed for foundation construction.

Based on our understanding of the site works and the investigation results, we recommend that NZS3604:2011 compliant foundations are embedded a minimum depth of 0.4m below current ground level.

5.2 Foundation Construction Recommendations

Construction should proceed in accordance with the NZS3604:2011. Topsoil should be removed from beneath the floor slab and compacted hardfill placed under the floor slab to the required level. In addition, the following recommendations should be considered:

1. To ensure that excavated footings are adequately founded we recommend that excavations should be undertaken by a digger fitted with a smooth edge bucket. The base should be tidily trimmed by hand, lightly compacted with a plate compactor and immediately covered with a concrete tidy slab or 100mm of compacted granular hardfill. A suitable qualified engineer with foundation experience or territorial authority building inspector should be retained to verify the adequate founding has been achieved and all loose and soft or compressible material was removed.
2. If there are significant soft layers beneath a sub-excavation, the softer material will have to be excavated and backfilled with 10MPa concrete or compacted hardfill underneath all load bearing foundation elements. For the hardfill, the sub-excavation will have to have plan dimensions of B+2D where B is the footing width and D is the depth of undercut. For 10MPa concrete the sub-excavation can have the same dimensions as the footing.
3. Depending on the soil encountered, the time of year, and fluctuations of the groundwater level, it is possible that excavations may encounter groundwater. The building contractor is to take appropriate measures to deal with any groundwater ingress to the foundation excavations and keep the excavations and backfill free of groundwater intrusions until the footings are cast.
4. The footing excavations are likely to expose layers of granular soils, which can be adversely affected by rainfall or stormwater. Foundation excavations should not be left open for more than three days. In addition, rainfall and stormwater should not be allowed to pond within the footing excavations as this may affect the bearing capacity of the subsoils.

6 References

Forsyth, Barrell & Jongers, (compliers), 2008. *Geology of the Christchurch Area*. Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 16.

New Zealand Geotechnical Database (2016). Retrieved 1 May 2017 from https://www.nzgd.org.nz

Christchurch City Council, 2010. *Infrastructure Design Standards - Part 4: Geotechnical Requirements.*

Geonet, 2012. ftp://ftp.geonet.org.nz/strong/processed/Proc (23/10/12)

GNS, 2012a. http://maps.gns.cri.nz/website/af/viewer.htm (23/10/12)

GNS, 2012b. http://www.gns.cri.nz/Home/News-and-Events/Media-Releases/earthquake-part-of-aftershock-sequence (23/10/12)

Ministry of Business Innovation and Employment (MBIE), 2012 '*Repairing and rebuilding houses affected by the Canterbury earthquakes'.*

NZGS, 2005. *Guidelines for the Classification and Field Description of Soils and Rocks in Engineering*. NZ Geotechnical Society Inc, Wellington, New Zealand.

NZS 3604:2011. *Timber Framed Buildings*. Standards New Zealand, Wellington, New Zealand.

NZS 4404:2010 *Land development and subdivision infrastructure*. Standards New Zealand, Wellington, New Zealand.

NZS 4431:1989 *Code of practice for earth fill for residential development*. Standards New Zealand, Wellington, New Zealand.

7 Explanatory Statement

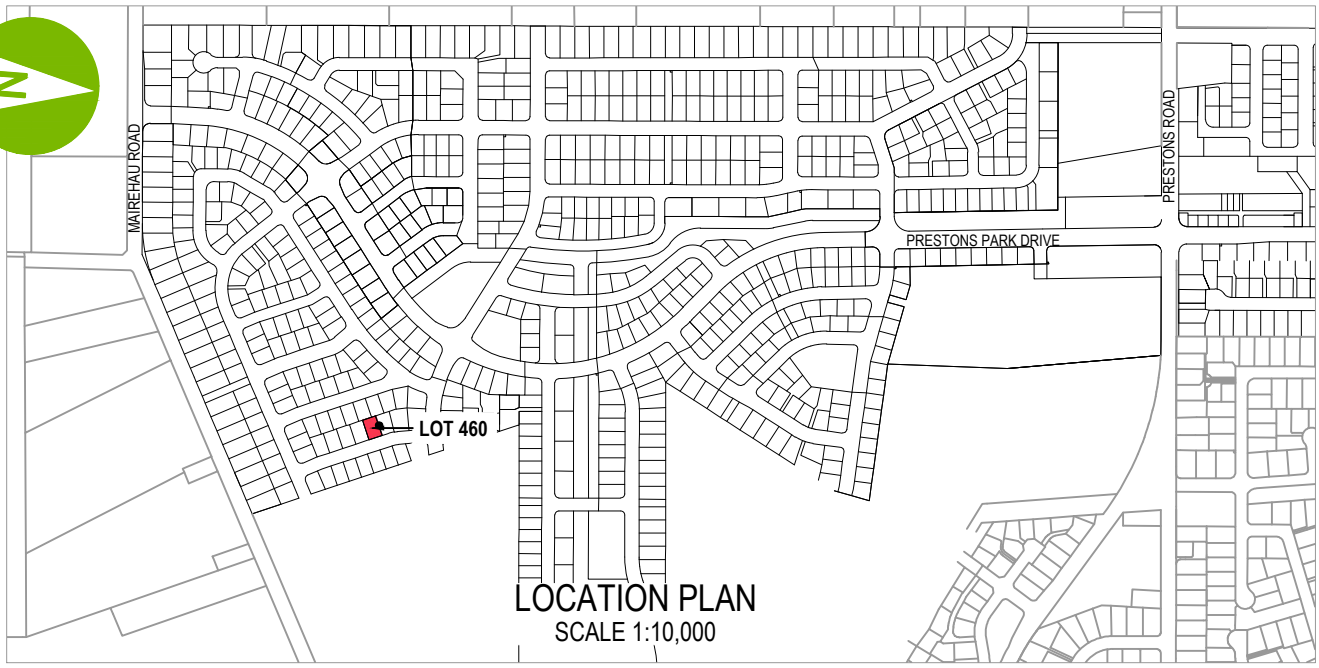
We have prepared this report in accordance with the brief as provided. The contents of the report are for the sole use of the Client for the purpose of building consent application only, and no responsibility or liability will be accepted to any other third party. Data or opinions contained within the report may not be used in other contexts or for any other purposes without our prior review and agreement.

The recommendations in this report are based on data collected at specific locations and by using suitable investigation techniques with limited site coverage. Only a finite amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground and groundwater between test locations has been inferred using experience and judgment and it must be appreciated that actual conditions could vary from the assumed model.

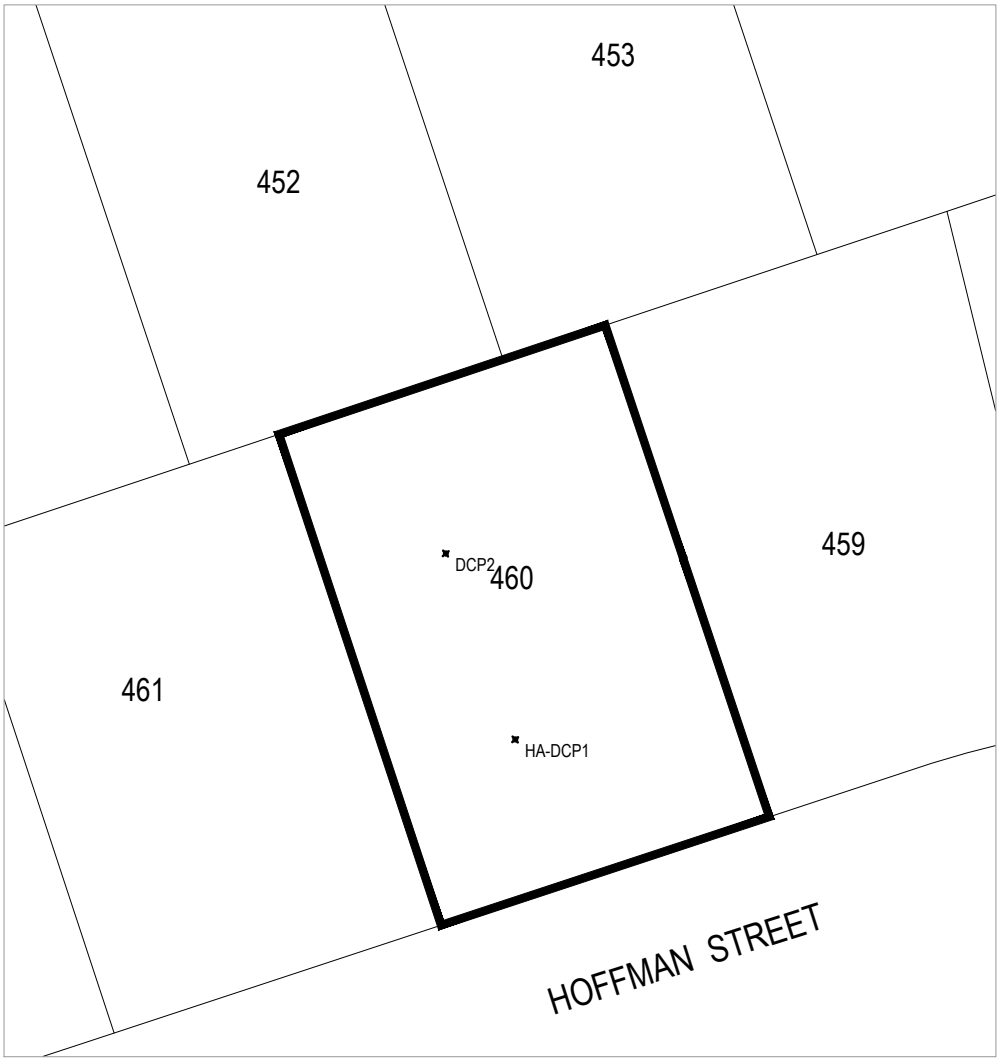
Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

Subsurface conditions, such as groundwater levels, can change over time. This should be borne in mind, particularly if the report is used after a protracted delay.

Appendix A
Figures



LOCATION PLAN
SCALE 1:10,000



4 0 8 16m
SCALE 1:400

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www.aurecongroup.com

CLIENT
PRESTONS PARK

REV	DATE	REVISION DETAILS	APPROVED
A	11/07/19	ISSUE FOR INFORMATION	T BROWNE

DRAWN	DESIGNED
R DAWSON	
CHECKED	
J MUIRSON	
APPROVED	DATE
T BROWNE	
T BROWNE	

PROJECT
PRESTONS PARK

TITLE
LOT 460
SITE LOCATION PLAN
FIGURE 1

INFORMATION
NOT FOR CONSTRUCTION

PROJECT No.	
235361	
SCALE	SIZE
1:400	A4
DRAWING No.	REV
GO-PS-S2-IN-460	A

Appendix B
Test Results

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HAND AUGER RECORD

HOLE NO. **HA1**

PROJECT NO. **235361**

PROJECT	**Prestons Park Subdivision** **Lot 460**		
CLIENT	**CDL Land NZ Ltd**	CO-ORDINATES (NZTM) **E 1573584** **N 5185495**	SHEET **1** of **1**
METHOD	**HA**		DATE from **10/08/2020** to **10/08/2020**
MACHINE & NO.	**NA**	ORIENTATION **VERTICAL**	GROUND-LEVEL **+13.54** m RL

Water level	Tests	Samples (Type Ref Depth)	Reduced Level	Depth (m)	Legend	STRATA DESCRIPTION
		0.00		0.00		Silty fine SAND and trace rootlets; brown. Moist. [TOPSOIL]
			+13.19	0.35		Fine to medium SAND; light brown. Dense, moist.
		HA				0.60m ... Very dense.
▼						1.90m ... Wet.
						2.10m ... Saturated.
			+11.24	2.30		End of Hand Auger at 2.30m, on 10/08/2020 *Termination Reason:* Effective refusal, hole collapse

SUBORDINATE FRACTION, MAJOR FRACTION, MINOR FRACTION, COLOUR, STRUCTURE, STRENGTH, MOISTURE CONDITION GRADING, BEDDING, PLASTICITY, ETC....
(NZ GEOTECHNICAL SOCIETY - FIELD DESCRIPTION OF SOIL AND ROCK)

- Small Disturbed Sample
- Large Disturbed Sample
- SPT Liner Sample
- Thin Wall Undisturbed Sample
- U100 Undisturbed Sample
- Pocket Penetrometer Test
- Piston Sample
- Water Level
- Impression Packer Test
- Standard Penetration Test
- Permeability Test
- Piezometer / Standpipe Tip
- Packer Test
- In-situ Vane Shear Test

LOGGED **F. MONTEITH**

DATE **10/08/2020**

CHECKED **K. FOOTE**

DATE **18/08/2020**

REMARKS

Groundwater encountered at 2.1m bgl.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Aurecon, Level 2 Iwikau Building, 93 Cambridge Terrace, Christchurch 8013. Tel: 03 366 0821 Fax: christchurch@aurecongroup.com

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO. **DCP1**

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573584
N 5185495

GROUND LEVEL **+13.54** m RL

TESTED / SUPERVISED BY **F. MONTEITH**

DATE **10/08/2020**

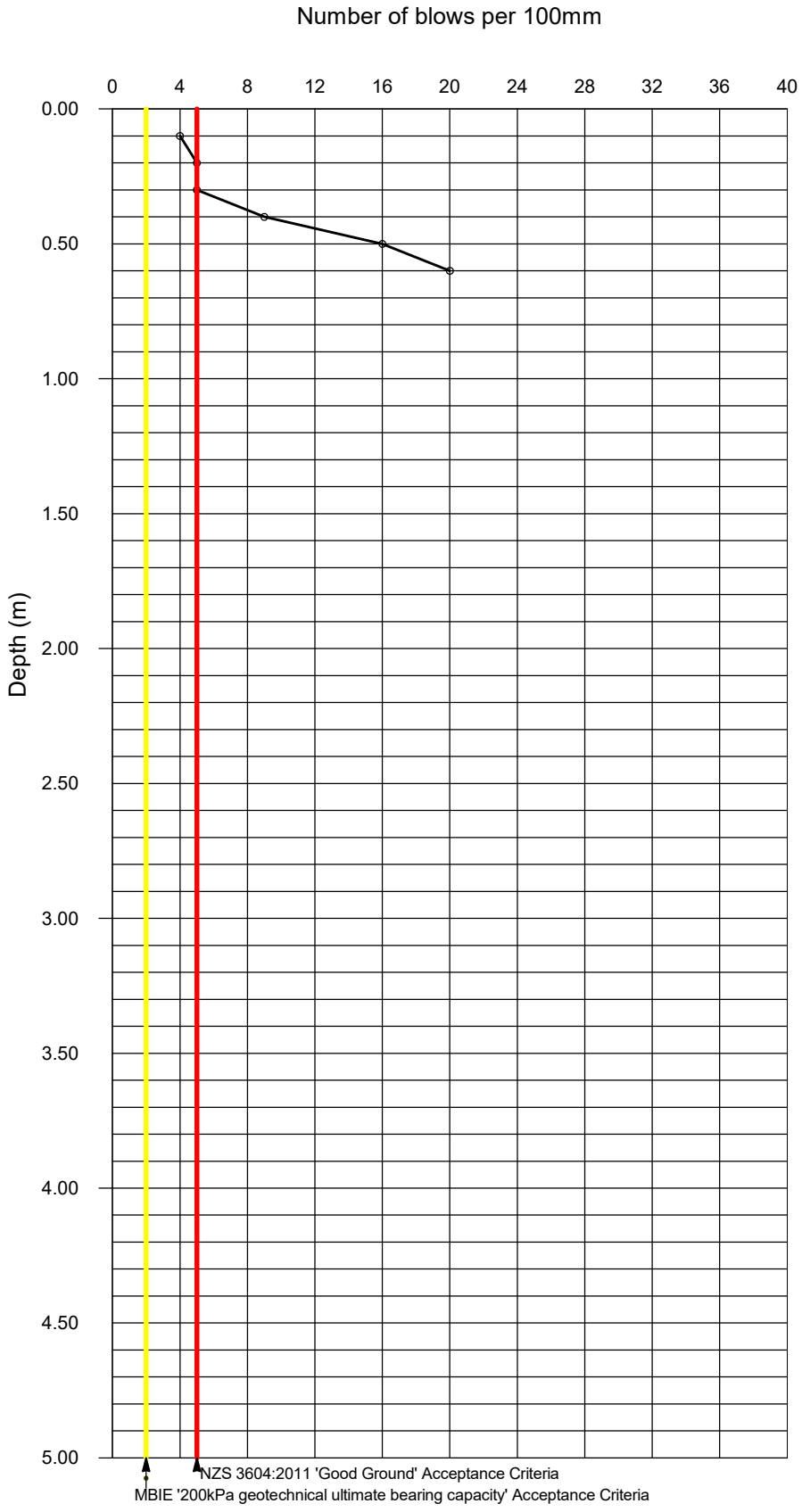
CHECKED BY **K. FOOTE**

DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	5
	5
	9
0.5	16
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

20 blows for 100mm in the last increment.

Co-ordinates and elevation data from site survey.

Elevation based on Christchurch Drainage Datum.

Effective refusal, 20+ blows per 100mm

aurecon
www.aurecongroup.com

DYNAMIC CONE (SCALA) PENETROMETER TEST RECORD

SCALA PENETROMETER NO.
DCP2

PROJECT **Prestons Park Subdivision**
Lot 460

PROJECT NO. **235361**

CO-ORDINATES (NZTM)
E 1573574
N 5185491

GROUND LEVEL **+13.56** m RL

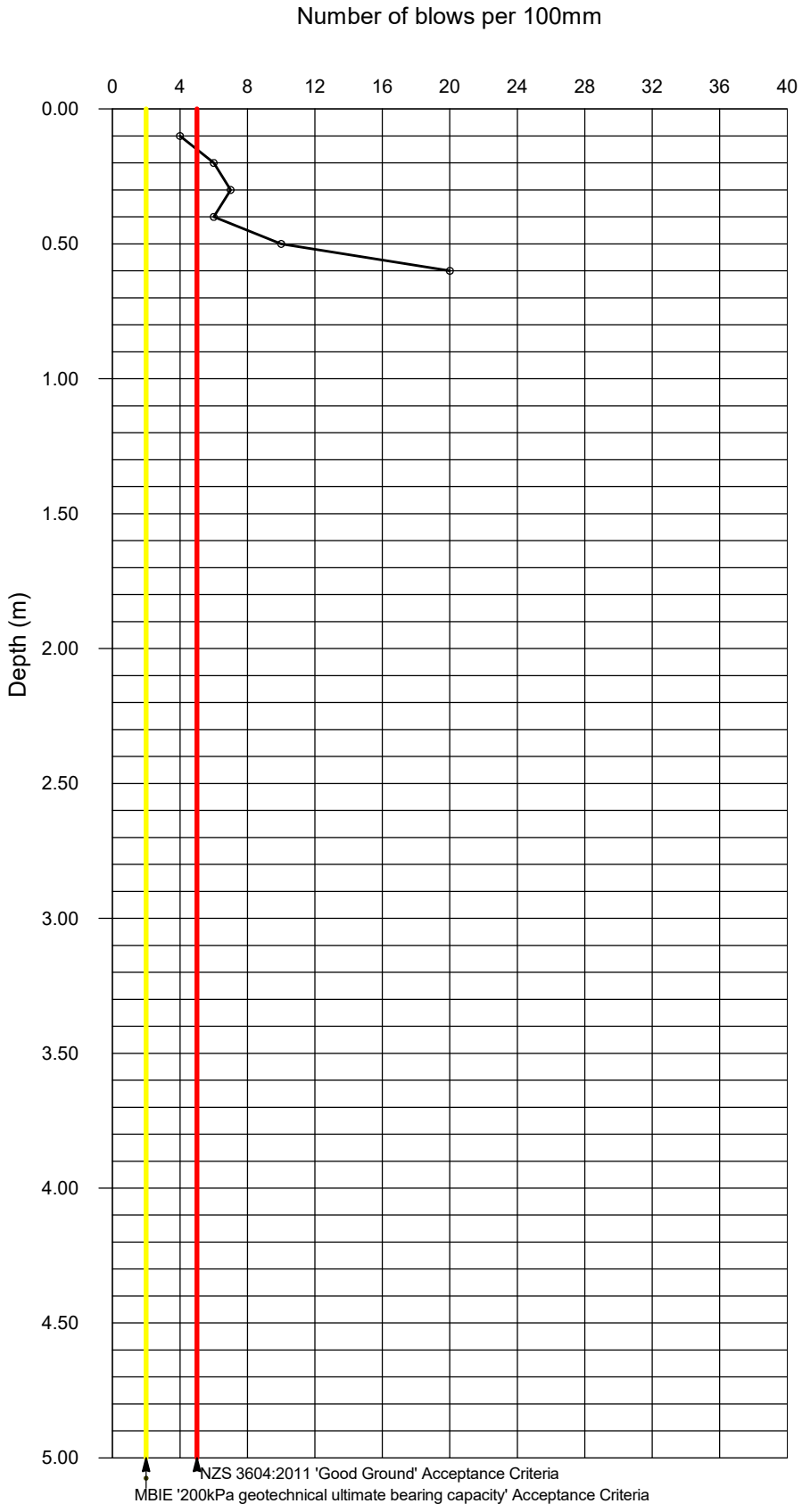
TESTED / SUPERVISED BY **F. MONTEITH**
DATE **10/08/2020**

CHECKED BY **K. FOOTE**
DATE **18/08/2020**

Results

Depth (m)	Blows per 100 mm
0.0	4
	6
	7
	6
0.5	10
	20
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	

Depth (m)	Blows per 100 mm
3.5	
4.0	
4.5	
5.0	



Remarks:

4 blows for 20mm in the last increment.
Co-ordinates and elevation data from site survey.
Elevation based on Christchurch Drainage Datum.
Effective refusal, 20+ blows per 100mm

Aurecon, Level 2 Iwikau Building, 93 Cambridge Terrace, Christchurch 8013. Tel: 03 366 0821 Fax: christchurch@aurecongroup.com

aurecon

Bringing ideas to life

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EXTERIOR CLADDING

Linea™ Oblique™
WEATHERBOARD

Vertical Installation Technical Specification

JULY 2018 | NEW ZEALAND

Contents

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie™
literaturefeedback@jameshardie.co.nz

1 Application and scope

1.1 APPLICATION

Linea™ Oblique™ Weatherboard installed as per this specification gives a vertical rusticated profile weatherboard appearance. Linea Oblique Weatherboard can be fixed to timber-framed external walls. A wide range of colours can be used, varying from light to dark. Linea Oblique Weatherboard is available in 200mm or 300mm wide x 4200mm or 2700mm lengths and is 16mm thick.

Specifiers

If you are a specifier or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Installers

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this James Hardie Technical Specification. All of the details provided in this document must be read in conjunction with the project specification.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 SCOPE

This specification covers the installation of Linea Oblique Weatherboard fixed vertically over James Hardie horizontal cavity battens on buildings that fall within the scope limitation of NZS 3604 and E2/AS1 of the New Zealand Building Code (NZBC).

This specification also covers the installation of Linea Oblique Weatherboard on projects, which are subject to specific engineering design (SED) up to a wind pressure of 2.5kPa (ULS).

1.3 DETAILS

Various typical Linea Oblique Weatherboard vertical construction details are provided in the Details section of this document. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded from our website at www.jameshardie.co.nz.

All dimensions shown are in millimetres unless noted otherwise.

1.4 SPECIFIC DESIGN

For use of Linea Oblique Weatherboard in a specific engineering design (SED) project that is outside the scope of this literature, the designer, architect or engineer must ensure that applicable clauses of the NZBC have been considered and a specific design has been undertaken.

Linea Oblique Weatherboard is suitable for use in SED project up to a wind pressure of 2.5kPa (ULS).

2 Design

2.1 COMPLIANCE

Linea Oblique Weatherboard has been isued a CodeMark certification number GM-CM30059 which confirms Linea Oblique Weatherboard is deemed to comply with the requirements of the NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the CodeMark certificate. Linea Oblique Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with this Linea Oblique Weatherboard Vertical Installation technical specification. BRANZ Appraisal number 897 (2015) at www.branz.co.nz or www.jameshardie.co.nz.

CODEMARK 30059

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and details, which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All New Zealand Standards referenced in this document are current editions and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 ‘Surface Water’. Foundation design must comply with the requirements of NZS 3604 ‘Timber-framed Buildings’ or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulation in accordance with the NZBC requirements.

2.4 SURFACE CLEARANCES

The clearance between the bottom edge of the cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

Linea Oblique Weatherboard must overhang the bottom plate by a minimum of 50mm, as required by E2/AS1.

Linea Oblique Weatherboard must maintain a minimum clearance of 100mm from paved ground, and 175mm from unpaved ground.

On roofs and decks, the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground, refer to Figure 3.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration. The building should also be ventilated sufficiently to control moisture accumulation due to condensation, especially in artificially cooled/heated buildings.

Walls must include those provisions as required by the NZBC Acceptable Solution Clause E2/AS1. In addition, all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in external walls, must comply with the requirements of relevant standards and the NZBC. For further guidance on designing for weathertightness, refer to BRANZ Ltd. and the Ministry of Business Innovation and Employment (MBIE) updates on the following websites respectively, www.branz.co.nz and www.building.govt.nz.

In addition, the following issues must also be considered:

- Sealant must be installed where detailed in this literature
- Where the walls are higher than two storeys, it is necessary to provide a horizontal flashing at the second floor level to drain the cavity
- The installation of smoke chimneys, pipe penetrations and other fixtures etc. must not track moisture into the wall or restrict the drainage of moisture to the exterior

2.6 STRUCTURE

2.6.1 Timber Framing

Timber-framed buildings must either be in accordance with NZS 3604 (Timber-framed Buildings) or designed as per specific engineering design. For a building requiring a specific engineering design, the framing stiffness must be equivalent to, or more than, the stiffness requirements of NZS 3604.

For specific design projects, the timber framing must be designed in accordance with the requirements of NZS 3603 and AS/NZS 1170.

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections generated by loadings etc.

2.6.2 Wind Pressures

Linea Oblique Weatherboard is suitable for use in wind zones up to and including EH as defined in NZS 3604.

Linea Oblique Weatherboard is also suitable for use in specific design projects up to wind pressures of 2.5kPa (ULS).

2.7 FIRE RATED WALLS

Linea Oblique Weatherboard when fixed over timber cavity battens to external walls can achieve fire ratings up to 60/60/60 to comply with Clause C/AS1 of the NZBC, when the walls are constructed in accordance with the current James Hardie ‘Fire and Acoustic’ Design Manual.

Linea Oblique Weatherboard is classified as a 'non-combustible' material suitable for use on walls close to a boundary.

2.8 STRUCTURAL BRACING

Linea Oblique Weatherboard installed as per this specification cannot be used to achieve structural bracing. However, bracing can be achieved by using a James Hardie rigid air barrier board installed direct to framing instead of a flexible underlay or by using the Villaboard™ Lining bracing system on the internal face of the wall. Refer to the James Hardie Bracing Design Manual for further information.

2.9 ENERGY EFFICIENCY

External walls constructed as per this technical specification using Linea Oblique Weatherboard and bulk insulation, where the area of glazing is 30% or less of the total wall area, complies with the insulation requirements for walls in the NZBC Acceptable Solution H1/AS1 (Energy Efficiency Clause H1), Table 1.

To meet thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulations having higher R-values. The thermal insulation of a wall changes when the size or spacing of timber framing is increased or decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and using an internal lining material such as Villaboard Lining or a 10mm plasterboard.

Table 1

Insulation capability		
Climate zone	**R-value requirement**	**Minimum cavity insulation infill requirement**
1 and 2	1.9 m^2 ºC/W	R2.0*
3	2.0 m^2 ºC/W	R2.2*

Total construction R-value depends on the insulation material used and the framing ratio. The insulation material R-values specified in this table are for studs spaced at 600mm centres and nogs spaced at 600mm centres.

* To achieve higher R-values of construction the wall insulation material must be replaced with an insulation material having higher R-values to suit the requirements.

For further guidance on insulation requirements refer to the current edition of ‘House Insulation Guide’ published by BRANZ.

3 Framing

3.1 GENERAL

Linea Oblique Weatherboard can be fixed either to a timber-frame or steel-frame.

For fixing to a steel frame Ask James Hardie on 0800 808 868 for specific requirements.

For Linea Oblique Weatherboard Vertical Installation:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum

Note: For fixing Linea Oblique Weatherboard, fastener spacing is provided in Section 5.

3.2 TIMBER FRAMING

3.2.1 Dimensions

A 90 x 45mm minimum framing size is required.

3.2.2 Structural Grade

Timber grade used must be in accordance with timber grades specified in NZS 3604.

3.2.3 Durability

The external framing timber must be treated to a minimum H1.2 treatment. Higher treatment levels may be used, but check for the compatibility of treatment chemicals with other materials. Refer to the NZBC Acceptable Solution B2/AS1 Durability for further information about the durability requirements.

For timber treatment and allowable moisture content information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round Sawn Timber) for minimum timber treatment selection and treatment requirements.

Also refer to the framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at the site in accordance with the framing manufacturer's recommendations.

3.2.4 Frame Construction

Use of timber framing must be in accordance with NZS 3604 and the framing manufacturer's specifications. The framing must be rigid and must not rely on the cladding for stability. Timber framing sizes and its set-out must comply with NZS 3604 and as specified in this technical specification.

The following framing is required:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum
- An extra stud is required in internal corners
- For specific design projects exposed to wind speeds higher than 55m/sec the stud size and spacing must be as per the design requirements but not exceeding 600mm maximum

In case of gable end trusses sitting on top plates of the external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by an independent design producer statement.

3.3 SPECIAL FRAMING REQUIREMENTS

The following are special framing requirements for both timber and steel framing:

- Double studs are required at internal corners, refer to Figure 10
- Extra packers may be required at external corners

3.4 TOLERANCES

In order to achieve the required performance and an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with Table 2.1 of NZS 3604 and the manufacturer's specifications. All framing shall be made flush.

4 Preparation

4.1 FLEXIBLE UNDERLAY/HOMERAB PRE-CLADDING

Flexible underlay/HomeRAB™ Pre-Cladding must be provided as per the requirements of External Moisture Clause E2 of the NZBC. The flexible underlay selected for use must comply with Table 23 of E2/AS1.

The flexible underlay must be fixed in accordance with section 9.1.7 of E2/AS1 and the underlay manufacturer's recommendations.

Walls which are not lined on the inside face (e.g. garage walls or gable ends), must include a rigid sheathing or an air barrier behind the cladding which complies with Table 23 of E2/AS1. For attached garages, flexible underlays must be selected in accordance with the NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. James Hardie HomeRAB Pre-Cladding complies with these requirements and is suitable for use in this situation. It must be installed in accordance with the James Hardie Rigid Air Barriers installation manual.

4.2 RAB BOARD

For EH wind zone or for specific engineering design (SED) projects where the wind pressure is higher than 1.5kPa, James Hardie RAB™ Board must be used.

To achieve temporary weathertightness using James Hardie RAB Board, windows/doors need to be temporarily installed. Refer to the James Hardie Rigid Air Barriers installation manual for further information regarding its installation.

4.3 CAVITY CLOSURE/VENT STRIP

The James Hardie uPVC cavity vent strip must be installed at the bottom of all walls and above all openings constructed using the drained and ventilated cavity construction method. It is important that the openings in the cavity closure/vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. James Hardie cavity closure/vent strip has an opening area of 1000mm^2/m length.

4.4 CAVITY BATTENS

Linea Oblique Weatherboard must be installed on a cavity. The battens provide ventilation and drainage between the frame and the weatherboard and are considered a “packer” only in this specification.

The James Hardie horizontal cavity battens are H3.1 treated in accordance with NZS 3640 (Chemical preservation of rough and sawn timber) to comply with the durability requirements of B2/AS1.

James Hardie horizontal cavity battens meet the requirements of E2/AS1 and:

- Are minimum 20mm thick and 45mm wide
- Fixed horizontally to nogs
- Fixed vertically to studs at corners and openings
- Must be fixed by the cladding fixings to the main framing over the flexible underlay. Therefore until claddings are fixed the battens only need to be tacked to framing by 40 x 2.8mm or longer nails at 800mm centres
- Permit air circulation and water drainage

4.5 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following options:

- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut

No intermediate supports are required:

- When studs are spaced at 400mm centres; or
- When rigid air barriers are used

4.6 FLASHINGS

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to Linea Oblique Weatherboard installation. Refer to moisture management requirements in Clause 2.5. The flexible underlay/rigid air barrier must be appropriately incorporated with penetration and junction flashings using flashing tapes. Materials must be lapped in such a way that water tracks down to the exterior on the face of the flexible underlay or rigid air barrier board.

The selected flashing materials must comply with the durability requirements of the NZBC. For information refer to Table 20 of E2/AS1.

When using James Hardie rigid air barrier boards the entire framing around openings must be protected with a flashing tape. The tape must be finished over the face of the rigid air barrier. Ensure to check the compatibility of flashing tapes and sealants with their manufacturers. Refer to the James Hardie Rigid Air Barriers installation manual for further information.

4.7 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. For an example of window details for Linea Oblique Weatherboard which meet the performance requirements of E2 External Moisture, an approved document of the NZBC, refer to Figures 11 to 13.

5 Installation

5.1 GENERAL

Linea Oblique Weatherboard must be installed vertically using the cavity construction method as per the details and information published in this manual.

The two widths of Linea Oblique Weatherboard can be mixed to create the desired look.

Linea Oblique Weatherboard must be kept under cover whilst in storage or at sites and they must be dry at the time of their installation. All site-cut board edges must be sealed with Dulux Acraprime 501/1, Dulux 1 Step, Resene Quick Dry or a similar sealer compatible with the finish coat before installation.

Linea Oblique Weatherboard must be fully supported and fixed through James Hardie horizontal cavity battens. Ensure that cladding is hard against the battens to avoid drumminess.

This technical specification only covers the vertical installation of Linea Oblique Weatherboard. Refer to the Linea Oblique Weatherboard horizontal installation technical specification for horizontal installation.

5.2 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing materials to be used in relation to exposure conditions and are summarised in Table 2.

Fasteners must be fully compatible with the other materials that they are to be in contact with, to ensure the durability of the complete assembly.

Table 2

Exposure conditions and nail selection prescribed by NZS 3604		
NAIL MATERIAL		
Zone D	Zone C* outside sea spray zone, Zone B and geothermal hot spots	Bracing - all zones
Grade 316 Stainless	Hot-dipped galvanised or Grade 316 Stainless	Grade 316 Stainless

*Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made. Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 FASTENER – SIZE AND LAYOUT

Linea Oblique Weatherboard must be fixed vertically to framing using fixings as specified in Table 3 below and follow the edge distance required for nails as shown in the details.

Table 3

Weatherboard fixing up to and including VH wind zone		
CAVITY CONSTRUCTION OVER FLEXIBLE UNDERLAY		
Linea Oblique Weatherboard 200	65x2.87mm D head nail or 65x2.87mm RounDrive ring shank nail or 60x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate, refer to Figure 6
Linea Oblique Weatherboard 300	65x2.87mm D head nail or 65x2.87mm RounDrive ring shank nails or 60x3.15mm HardieFlex nail	Fix one nail 150mm from bottom edge of board per nog/plate, refer to Figure 7

Weatherboard fixing up to and including VH wind zone		
CAVITY CONSTRUCTION OVER HOMERAB PRE-CLADDING/RAB BOARD		
Linea Oblique Weatherboard 200	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate, refer to Figure 6
Linea Oblique Weatherboard 300	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 150mm from bottom edge of board per nog/plate, refer to Figure 7

Weatherboard fixing EH wind zone and SED projects		
CAVITY CONSTRUCTION OVER RAB BOARD		
Linea Oblique Weatherboard 200	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate Refer to Figure 8
Linea Oblique Weatherboard 300	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail at 150mm from bottom edge of board per nog/plate. Refer to Figure 9

For other fixing options Ask James Hardie on 0800 808 868.

- When fixing the weatherboards using nail guns, refer to the nail gun manufacturer for information about nails and the type of nail gun to be used
- D head nails - finish nails 2mm below weatherboard surface
- RounDrive nails - finish nails flush with weatherboard surface
- HardieFlex nails - finish nails flush with weatherboard surface

6 Joints

6.1 VERTICAL JOINT

Linea Oblique Weatherboard vertical joint shall be formed using the ship lap edge of the Linea Oblique Weatherboard. Ensure that the Linea Oblique Weatherboards are securely interlocked before nailing, refer to Figures 6 to 9.

6.2 HORIZONTAL JOINT

Linea Oblique Weatherboard can run continuously over floor joists without a flashed horizontal joint when LVL timber floor joists or engineered joist are used, refer to Figure 17.

When using a solid timber joist, a horizontal joint or a movement joint must be formed at floor joist, refer to Figure 19.

6.3 DRAINAGE JOINT

After every two floors a horizontal drainage joint flashing is required as per E2/AS1, refer to Figure 22.

6.4 EXTERNAL CORNER

An external box corner flashing is used to fix the external corners, refer to Figure 11. Alternatively an Axent™ Trim external boxed corner can also be formed, refer to Figure 12.

6.5 INTERNAL CORNER

An internal corner flashing is to be used to form an internal corner joint, refer to Figure 10.

An extra stud is required in internal corners.

Note: All joint mouldings to be fixed at 400mm centres both sides.

7 Finishes

7.1 PREPARATION

The D head nail must be finished 2mm below the weatherboard surface. The nail holes must be filled with an exterior grade two part builders fill, ie. CRC ADOS Builders Fill or similar two part external grade filler. The RounDrive nail heads must finish flush with weatherboard surface.

7.2 PAINTING

Linea Oblique Weatherboard is pre-primed and is suitable for site applied acrylic paints.

In order to seal cut edges or sanded patches, Dulux 1 Step, Acraprime 501/1, Resene Quick Dry, Taubmans Underproof Acrylic Primer Undercoat or a similar product should be applied. The primer should be compatible with the paint to be used.

Painting of Linea Oblique Weatherboard is mandatory to meet the durability requirements of the NZBC and the 25 year James Hardie product warranty. Linea Oblique Weatherboard must be dry and free of any dust or grime before painting. The weatherboards must be painted within 90 days of their installation. There is no restriction on the LRV of paint to be applied on the Linea Oblique Weatherboard.

James Hardie recommends a minimum of two coats of exterior grade acrylic paint. Follow the paint manufacturer's recommendations to prepare the surface and to adequately cover and conceal the weatherboard fixings.

7.3 FLEXIBLE SEALANT

Sealant used must comply with the relevant requirements of the NZBC. Their application and usage must be in accordance with the manufacturer's instructions. Check with the sealant manufacturer prior to coating over sealant. Some sealant manufacturers do not recommend coating over their product.

8 Storage and handling

When storing Linea Oblique Weatherboard, they must be laid flat on a smooth level surface. Edges and corners must be protected from chipping.

To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards become wet, allow them to dry thoroughly before fixing.

Do not carry weatherboards on the flat, carry on edge to avoid excessive bending.

9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to maintain the effectiveness of the cladding. The extent and nature of maintenance required will depend on the geographical location and exposure of the building.

As a guide, it is recommended that the basic normal maintenance tasks shall include, but not be limited to:

- Washing down exterior surfaces every 6-12 months*
- Re-coating exterior protective finishes**
- Regular inspection and repair if necessary of the cladding joints, sealants, nail head fillers
- Cleaning out gutters, down pipes and overflow pipes as required
- Pruning back vegetation which is close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained, especially where gardens are concerned
- The clearance between the bottom edge of the Linea Oblique Weatherboard and the finished/unfinished ground must always be maintained

**Do not use a water blaster to wash down the cladding. In extreme coastal conditions or sea spray zones, wash every 3-4 months.*

***Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.*

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

Linea Oblique Weatherboard is an advanced lightweight cement composite cladding, manufactured using James Hardie formulation. Basic composition is Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Linea Oblique'.

Linea Oblique Weatherboard is manufactured to Australian/New Zealand Standard AS/NZS 2908.2 ‘Cellulose-Cement Products’ (ISO 8336 ‘Fibre-Cement Flat Sheet’).

Linea Oblique Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 “Cellulose-Cement Products”.

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

10.2 PRODUCT MASS

Linea Oblique Weatherboard is manufactured in 16mm thickness and has a mass of 20.57kg/m^2 for 200mm and 19.67kg/m^2 for 300mm.

Linea Oblique Weatherboard is defined as a Light Weight Wall Cladding (not exceeding 30kg/m^2) as per NZS 3604.

10.3 DURABILITY

Linea Oblique Weatherboard and James Hardie rigid air barrier installed and maintained as per this technical specification will meet the durability requirement for cladding as per the NZBC clause B2 Durability.

10.3.1 Resistance to Moisture/Rotting

Linea Oblique Weatherboard is resistant to permanent moisture induced deterioration (rotting) and meets the requirements of the following tests in accordance with the AS/NZS 2908.2:

- Heat Rain (Clause 6.5)
- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Soak Dry (Clause 8.2.5)

10.3.2 Control of External Fire Spread

Linea Oblique Weatherboard meets the requirements of Appendix C C7.1.1 and is classified as ‘Non-Combustible Material’ which is suitable for use as external wall cladding and complies with the requirements of Paragraph 5.4 of the NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of Acceptable Solutions C/AS2 to C/AS6 of the NZBC.

10.3.3 Alpine Regions

In regions subject to freeze/thaw conditions, Linea Oblique Weatherboard and James Hardie rigid air barrier must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snowdrifts over winter are expected.

These products meet the requirements of the AS/NZS 2908.2 Clause 8.2.3.

11 Safe working practices

11.1 STAY HEALTHY WHEN WORKING WITH BUILDING PRODUCTS CONTAINING CRYSTALLINE SILICA

Crystalline Silica
What is it? Why and when is it a health hazard?

Crystalline Silica is
- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?
- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?
- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS AND INSTALLATION INSTRUCTIONS WHEN WORKING WITH JAMES HARDIE PRODUCTS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

11.2 AVOID BREATHING IN CRYSTALLINE SILICA DUST!

Safe working practices
- NEVER use a power saw indoors or in a poorly ventilated area
- NEVER dry sweep
- ALWAYS use M Class extractor unit as a minimum and always hose down with water/wet wipe for clean up
- NEVER use grinders
- ALWAYS use a circular sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance
- ALWAYS follow tool manufacturers' safety recommendations
- ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ALWAYS wear an approved properly-fitted, approved dust mask (P1 or P2) or respirator

Use one of the following methods based on the required cutting rate:

BEST
- HardieKnife™
- Hand guillotine
- Fibreshear

BETTER
- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and M Class extractor unit.

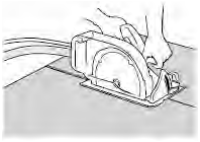
Working outdoors
- Make sure you work in a well ventilated area
- Position cutting station so wind will blow dust away from yourself and others in the working area
- Cut products with either a HardieKnife™ or fibre cement shears or, when not feasible, use a HardieBlade™ Saw Blade (or equivalent) and a dust-reducing circular saw attached to a M Class extractor unit
- When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or P2 mask (correctly fitted in accordance with manufacturers' instructions) and when others are close by, ask them to do the same
  - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
  - Wear safety glasses
  - Wear hearing protection
  - When others are close by, ask them to do the same

Working indoors
- Never cut using a circular saw indoors
- Position cutting station in a well ventilated area
- Cut ONLY using a HardieKnife™, hand guillotine or fibreshears (manual, electric or pneumatic)
- Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class extractor unit

IF CONCERN STILL EXISTS ABOUT EXPOSURE LEVELS OR YOU DO NOT COMPLY WITH THE ABOVE PRACTICES, YOU SHOULD ALWAYS CONSULT A QUALIFIED INDUSTRIAL HYGIENIST.

Working Instructions

- Refer to Recommended Safe Working Practices before starting any cutting or machining of product



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut

Hole-Forming

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill

For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

11.3 STORAGE AND DELIVERY

Keeping products and people safe

Off loading

- James Hardie products should be off-loaded carefully by hand or by forklift
- James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

- In their original packaging
- Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- Off the ground – either on a pallet or adequately supported on timber or other spacers
- Flat so as to minimise bending

James Hardie products must not be stored:

- Directly on the ground
- In the open air exposed to the elements

JAMES HARDIE IS NOT RESPONSIBLE FOR DAMAGE DUE TO IMPROPER STORAGE AND HANDLING.

11.4 TIPS FOR SAFE AND EASY HANDLING

Weatherboard products

- Do not lift planked products flat and in the middle
- Carry the products on the edge
- If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- If two people are carrying the plank, hold it near each end and on edge
- Exercise care when handling weatherboard products to avoid damaging the edges/corners

Sheet products

- Carry with two people
- Hold near each end and on edge
- Exercise care when handling sheet products to avoid damaging the edges/corners

12 Product and accessories

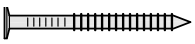
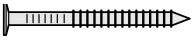
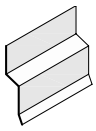
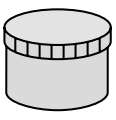
Linea Oblique Weatherboard information					
Product	**Description**	**Size (mm)**			**Code**
		Thickness	**Length**	**Width**	
	**Linea Oblique Weatherboard** A 16mm profiled weatherboard for residential cladding. Factory sealed on all six sides. Each weatherboard has a manila white colour primer applied on its face, which accepts a wide range of paint finishes.	16	2700 4200	200 300 200 300	**404855** **404856** **404849** **404848**

Note: All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Accessories/tools supplied by James Hardie			
Accessories	**Description**	**Size**	**Code**
	**James Hardie Horizontal Cavity Batten 20mm** H3.1 Timber treated batten the cladding is fixed over	2700mm long	**305862**
	**Oblique Trimline Joint Flashing** Aluminium extrusion used behind cladding at horizontal joints.	3000mm long	**305826**
	**JH Weatherboard Internal 'W' Corner** Anodised aluminium extrusion used to create internal corners.	2700mm long	**300386**
	**Linea Oblique Weatherboard External Box Corner** Anodised aluminium extrusion used to create external corners.	2700mm long 4000mm long	**305825** **305873**
	**uPVC Vent Strip** PVC moulding used as vermin proofing.	3000mm long	**302490**
	**Trimline Horizontal Jointer** A jointer to cover the butt joint of Oblique Trimline Joint Flashing	100mm long	**305871**
	**Trimline External Corner Jointer** Joins Trimline Joint Flashing at an external corner		**305870**
	**Trimline Internal Corner Jointer** Joins Trimline Joint Flashing at an internal corner		**305872**
	**Linea Oblique Plug** To fill recess in Linea Oblique Weatherboard		**305930**
Tools			
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included.	184mm 254mm	**300660** **303375**

Accessories/tools not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with Linea Oblique Weatherboard and James Hardie rigid air barrier. James Hardie does not supply these products and does not provide a warranty for their use. Please contact component manufacturer for information on their warranties and further information on their products.

Product	Description
	**Flexible underlay** Must comply with Table 23 of E2/AS1.
	**Flexible window opening flashing tape** A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this manual for more information. e.g. Protecto or SUPER-STICK Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
	**Rigid air barrier vertical joint sealing tape** The tape to be used to seal James Hardie rigid air barrier vertical joints. SUPER-STICK Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
	**Flexible Sealant** Bostik Seal N Flex-1, Sikaflex AT Facade, Sikaflex MS or similar.
	**65 x 2.87mm 'D' head nail or 65 x 2.87 RounDrive nail** (ring shank hot dipped galvanised/stainless steel) For fixing Linea Oblique Weatherboard.
	**75 x 3.06mm 'D' head nail or 75 x 3.15 RounDrive nail** (hot dipped galvanised or ring shank stainless steel) For fixing Linea Oblique Weatherboard.
	**40 x 2.8mm or longer HardieFlex™ nail.** For fixing timber cavity battens and aluminium flashings.
	**Meter box** Refer electrical suppliers.
	**Head flashing** Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.
	**Exterior grade filler** CRC ADOS Builders Fill or similar two part filler to fill over nail holes

13 Details

The following generic details have been provided in this document for cavity construction methods.

Table 5

Details		
Description	**Cavity Construction**	
	Figure No.	**Page No.**
Framing set out	Figure 1	15
Cladding and James Hardie horizontal batten setout	Figure 2	16
Ground clearance	Figure 3	17
Soffit detail	Figure 4	17
No soffit detail	Figure 5	18
Vertical joint 200mm weatherboard width up to VH wind zone	Figure 6	18
Vertical joint 300mm weatherboard width up to VH wind zone	Figure 7	19
Vertical joint 200mm weatherboard width EH wind zone and SED	Figure 8	19
Vertical joint 300mm weatherboard width EH wind zone and SED	Figure 9	20
Internal corner	Figure 10	20
External aluminium box corner	Figure 11	21
External box corner	Figure 12	21
Window sill	Figure 13	22
Window head	Figure 14	22
Window jamb	Figure 15	23
Window jamb flashing	Figure 16	23
Over joist at floor level	Figure 17	24
Butt jointing of Vertical Linea Oblique Weatherboard	Figure 18	25
Trimline flashing joint at floor level	Figure 19	25
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Trimline joint	Figure 21	27
Drained flashing joint at floor level	Figure 22	28
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Roof to wall junction detail	Figure 26	31
Meter box at sill	Figure 27	31
Meter box at jamb	Figure 28	32
Meter box at head	Figure 29	32
Enclosed deck	Figure 30	33
Pipe penetration	Figure 31	34
Cladding installed	Figure 32	35
Garage head	Figure 33	36
Garage jamb	Figure 34	36

Figure 1: Framing set out

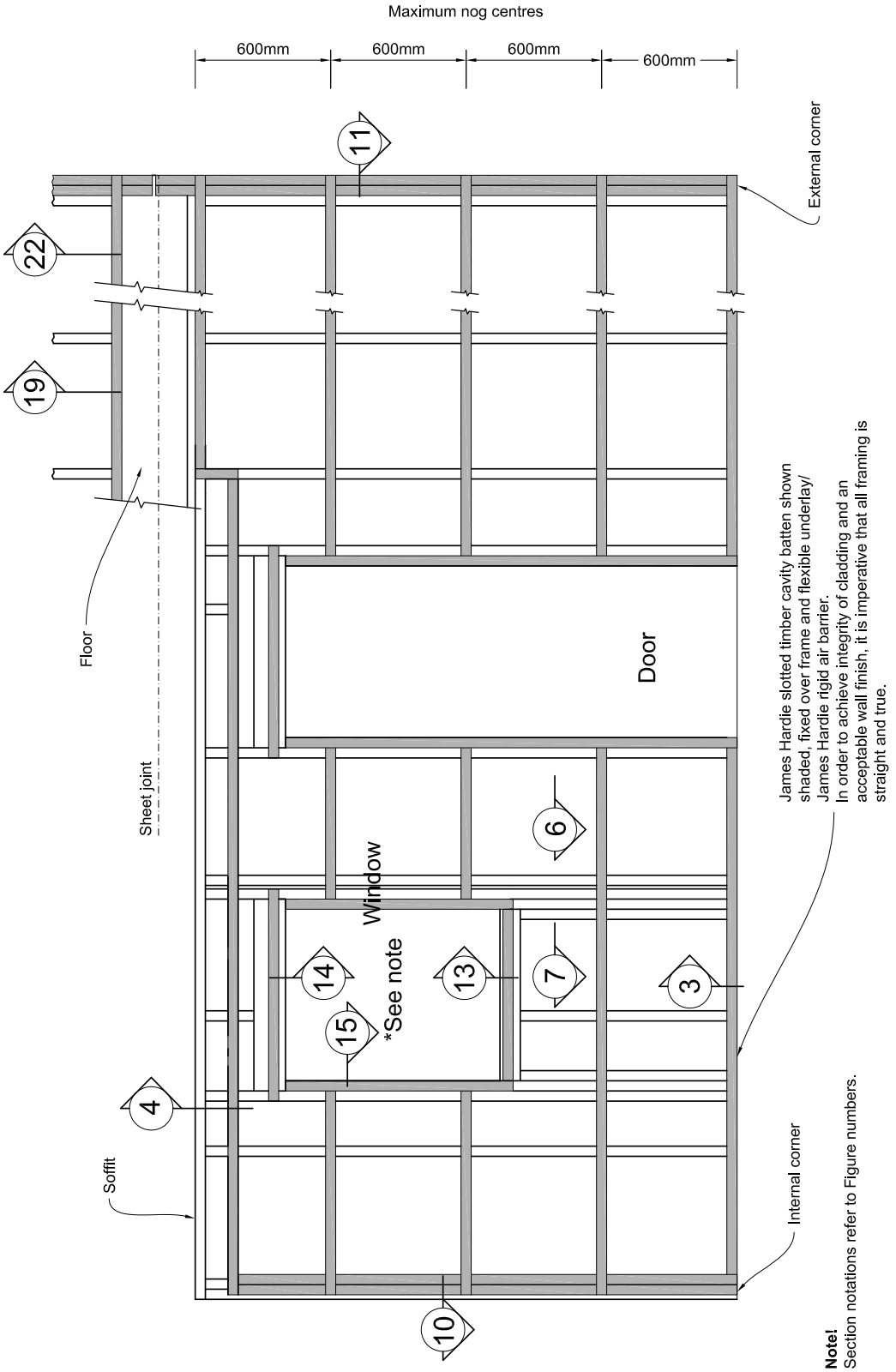
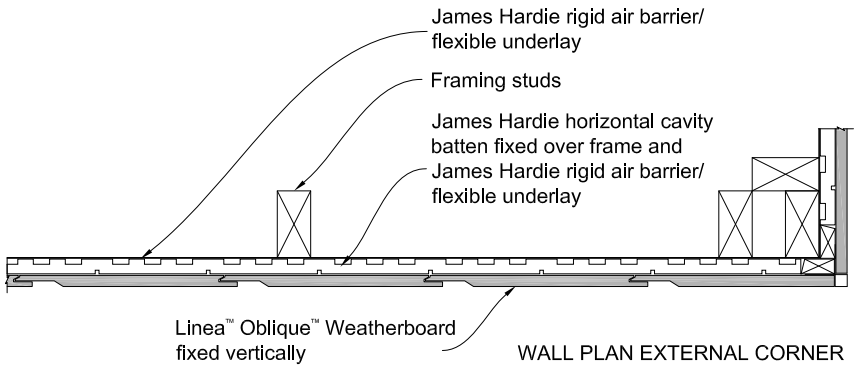
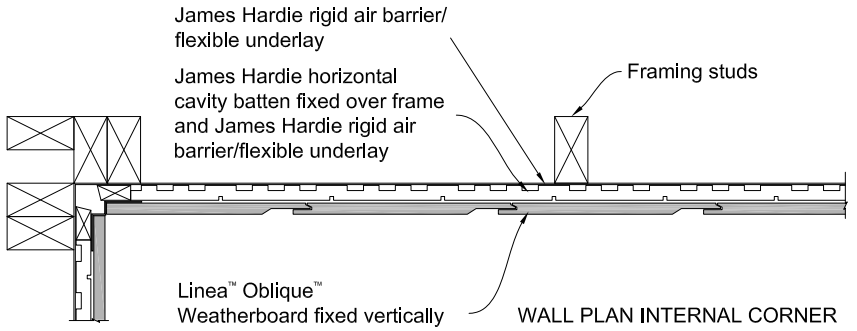


Figure 2: Cladding and James Hardie horizontal batten setout





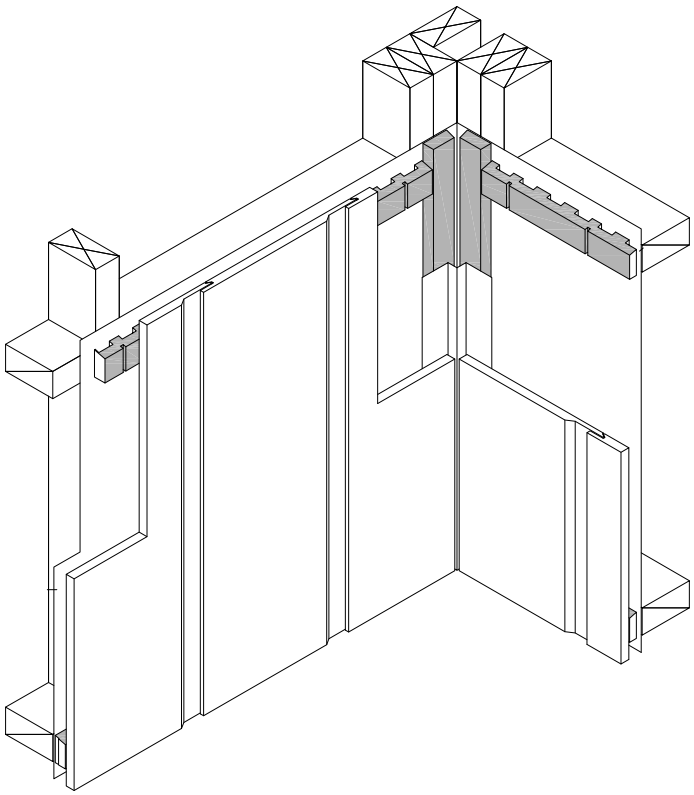


Figure 3: Ground clearance

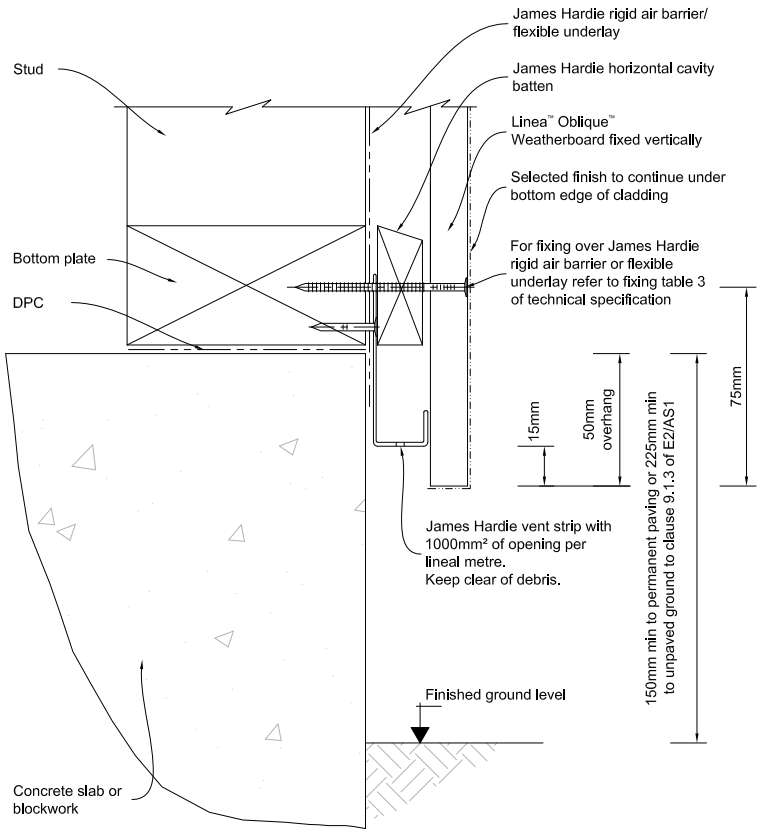


Figure 4: Soffit detail

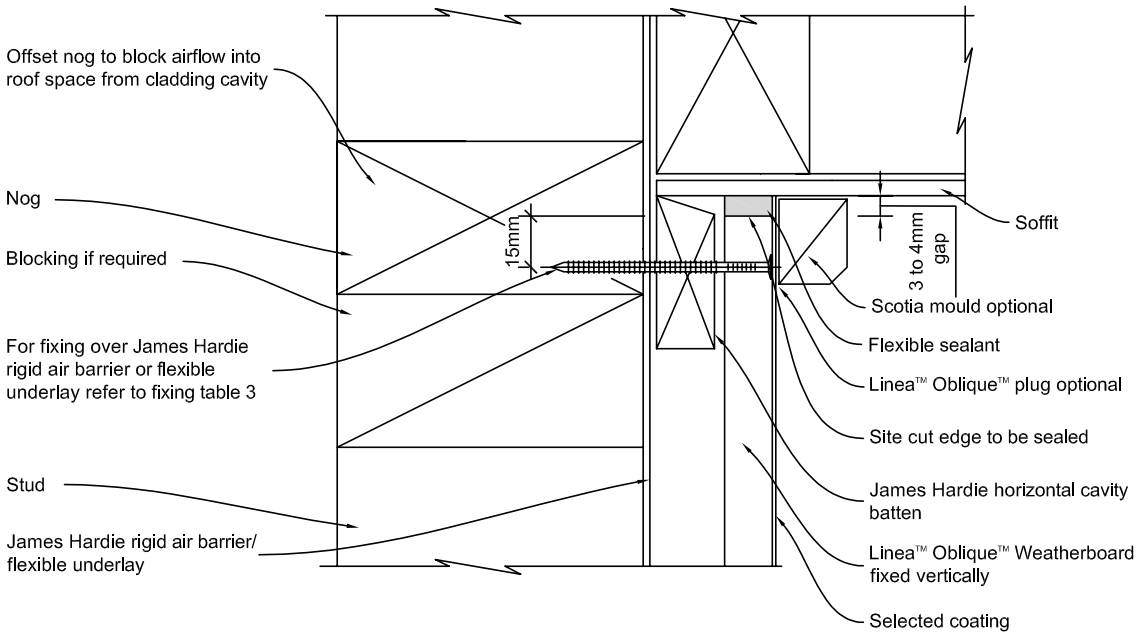


Figure 5: No soffit detail

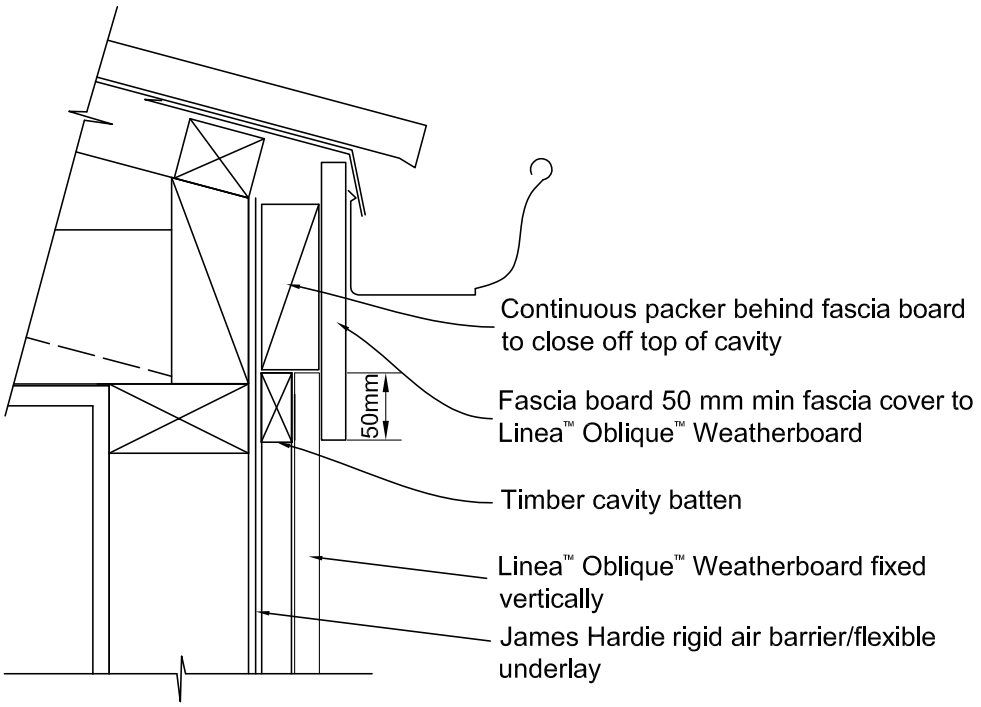


Figure 6: Vertical joint 200mm weatherboard width up to VH wind zone

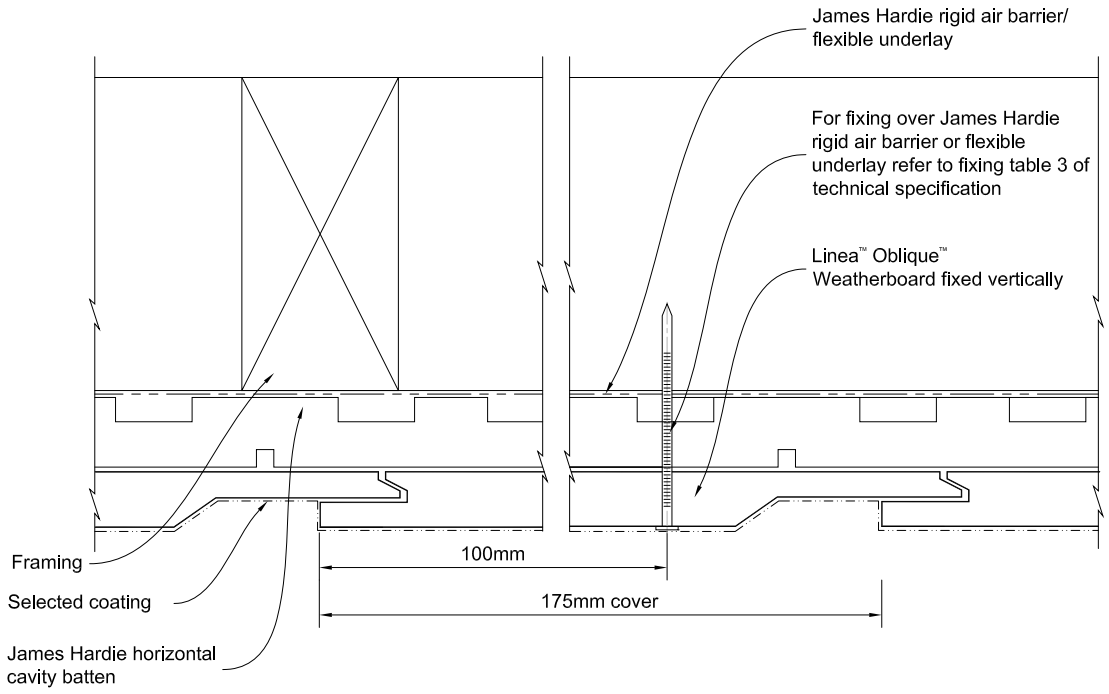


Figure 7: Vertical joint 300mm weatherboard width up to VH wind zone

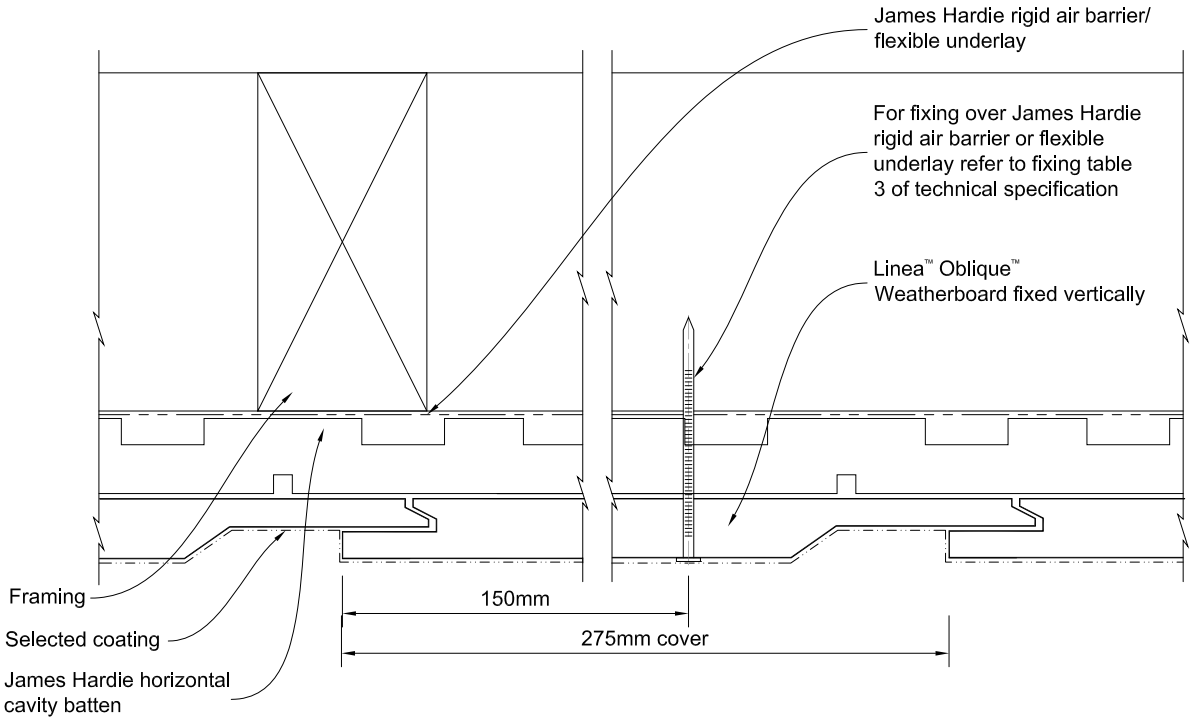


Figure 8: Vertical joint 200mm weatherboard width EH wind zone and SED

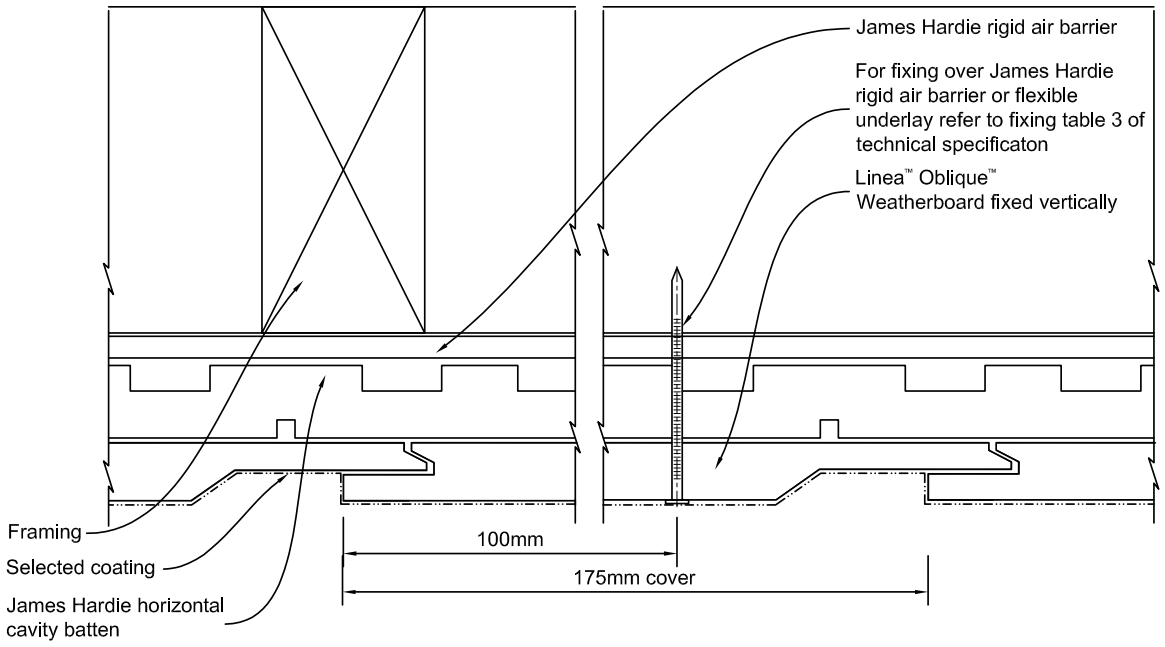


Figure 9: Vertical joint 300mm weatherboard width EH wind zone and SED

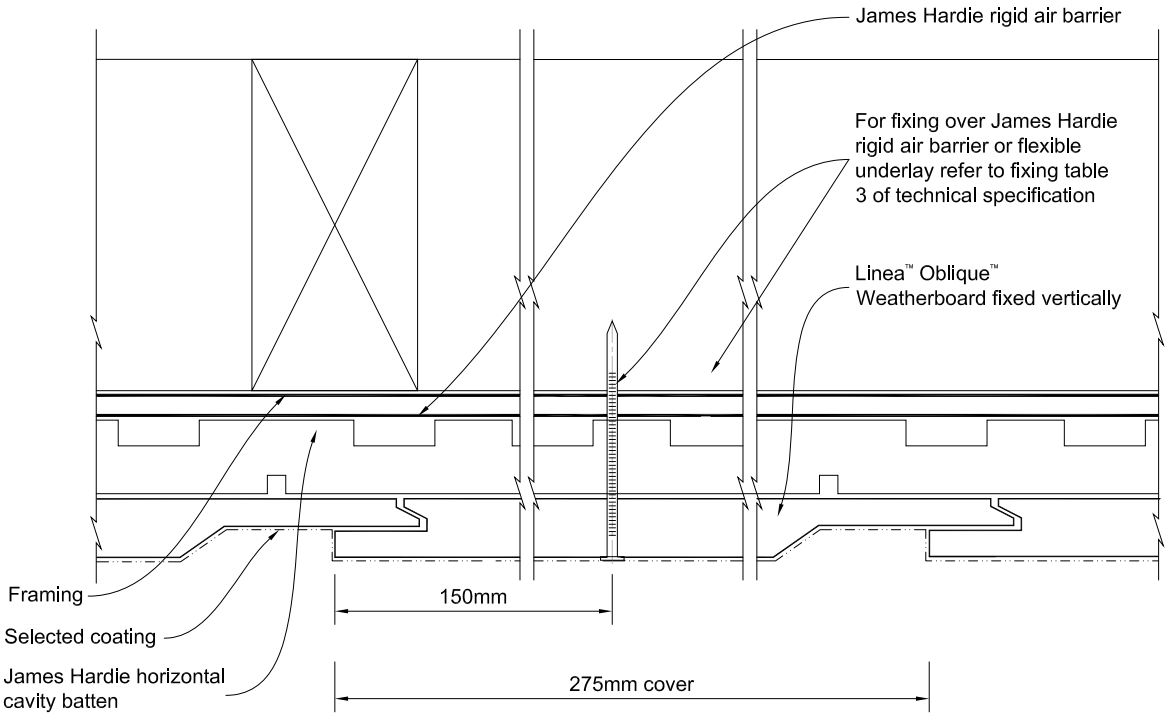


Figure 10: Internal corner

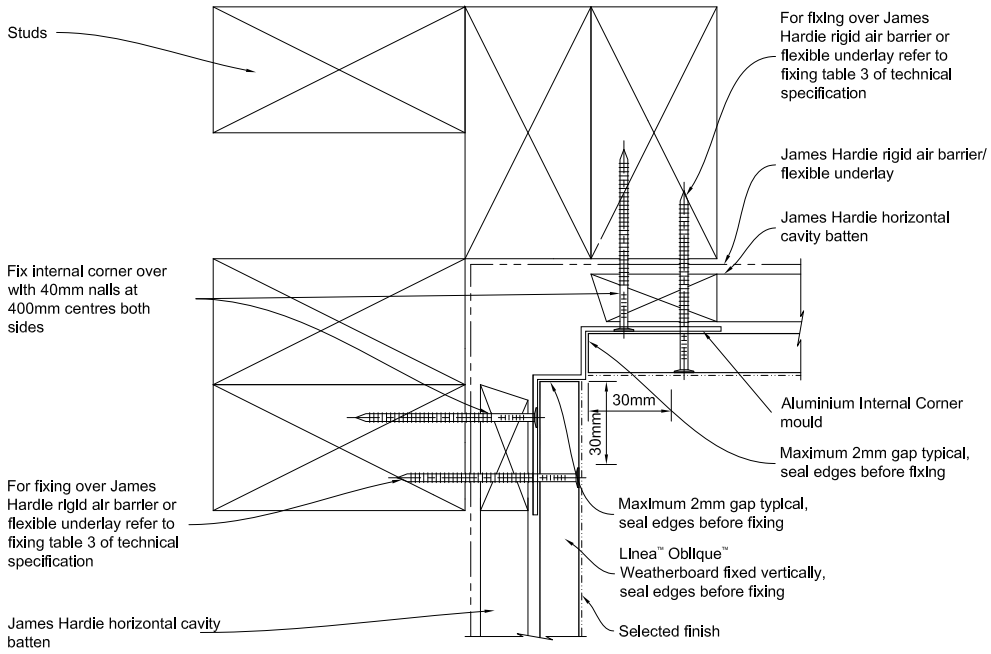


Figure 11: External aluminium box corner

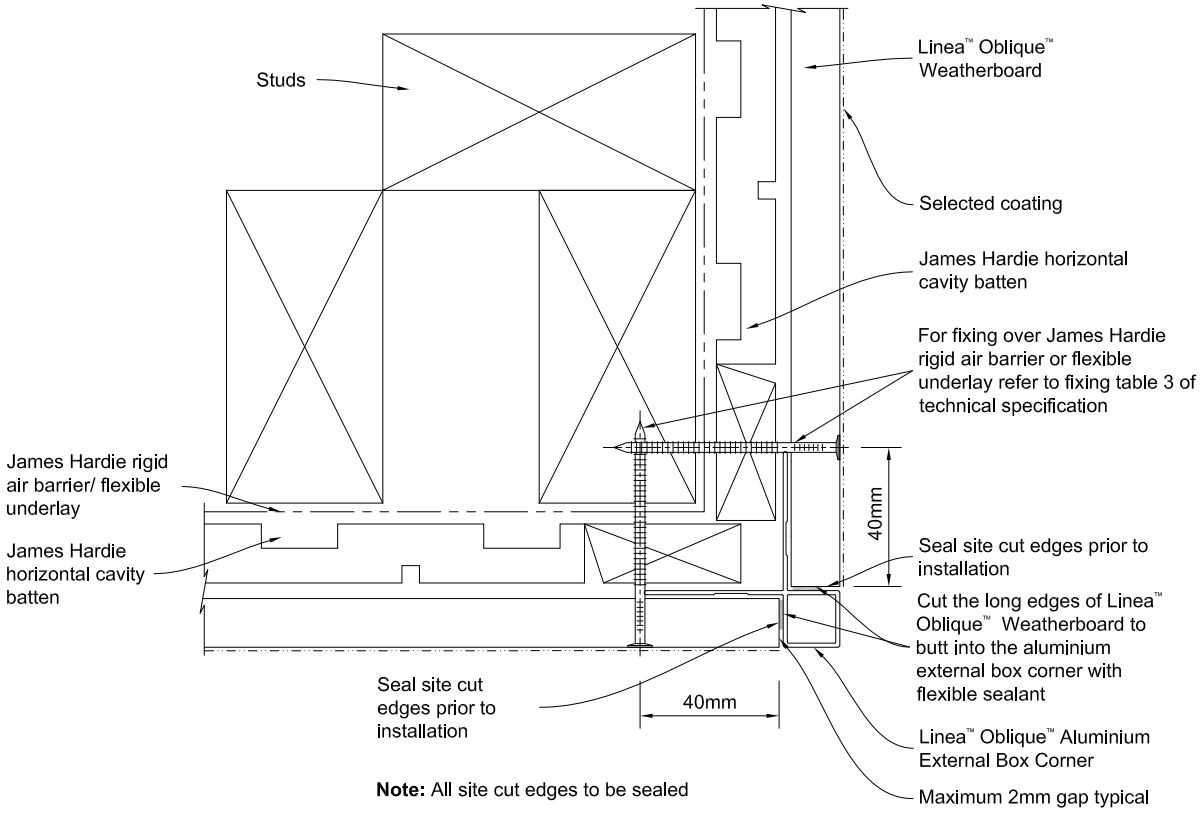


Figure 12: External box corner

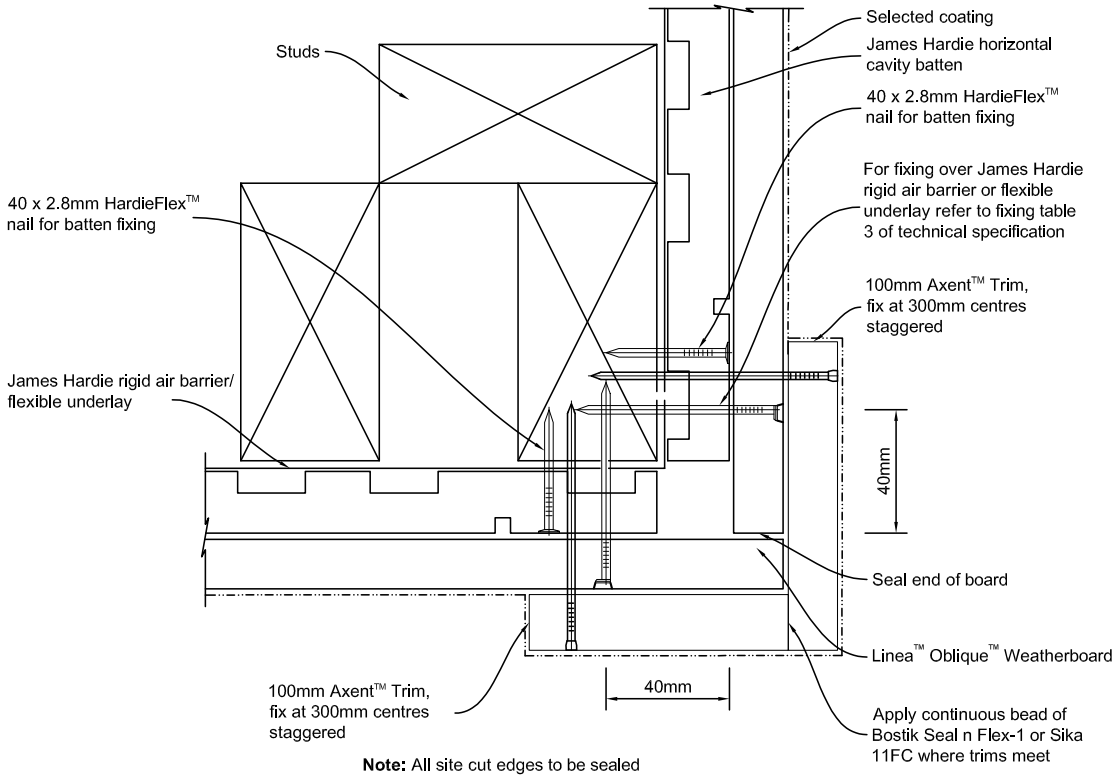
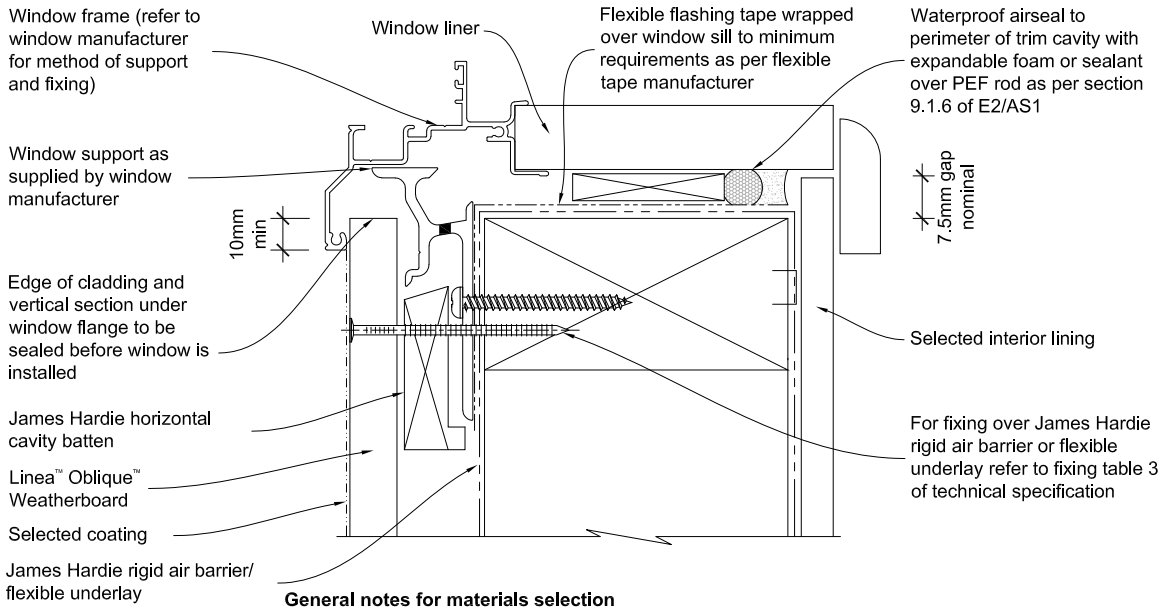


Figure 13: Window sill

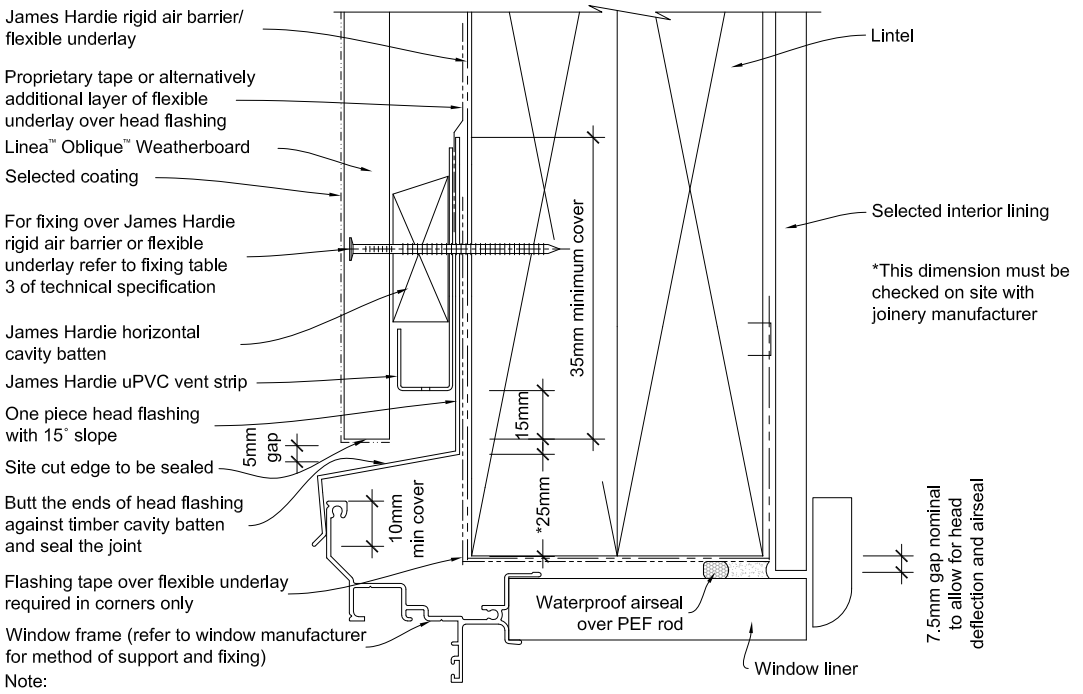


General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. When James Hardie rigid air barriers are used flashing tape to be applied to the entire opening

Refer to the manufacturer or supplier for technical information for these materials.

Figure 14: Window head



Note:

- When James Hardie rigid air barriers are used flashing tape to be applied to the entire window opening
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED projects
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1

Figure 15: Window jamb

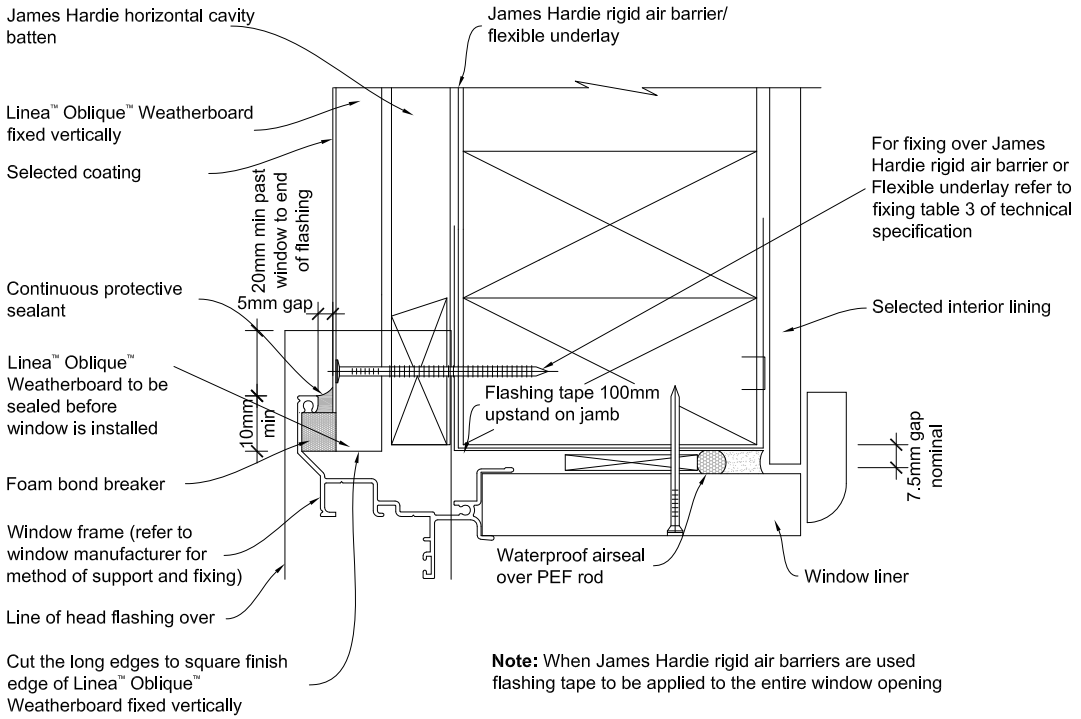


Figure 16: Window jamb flashing

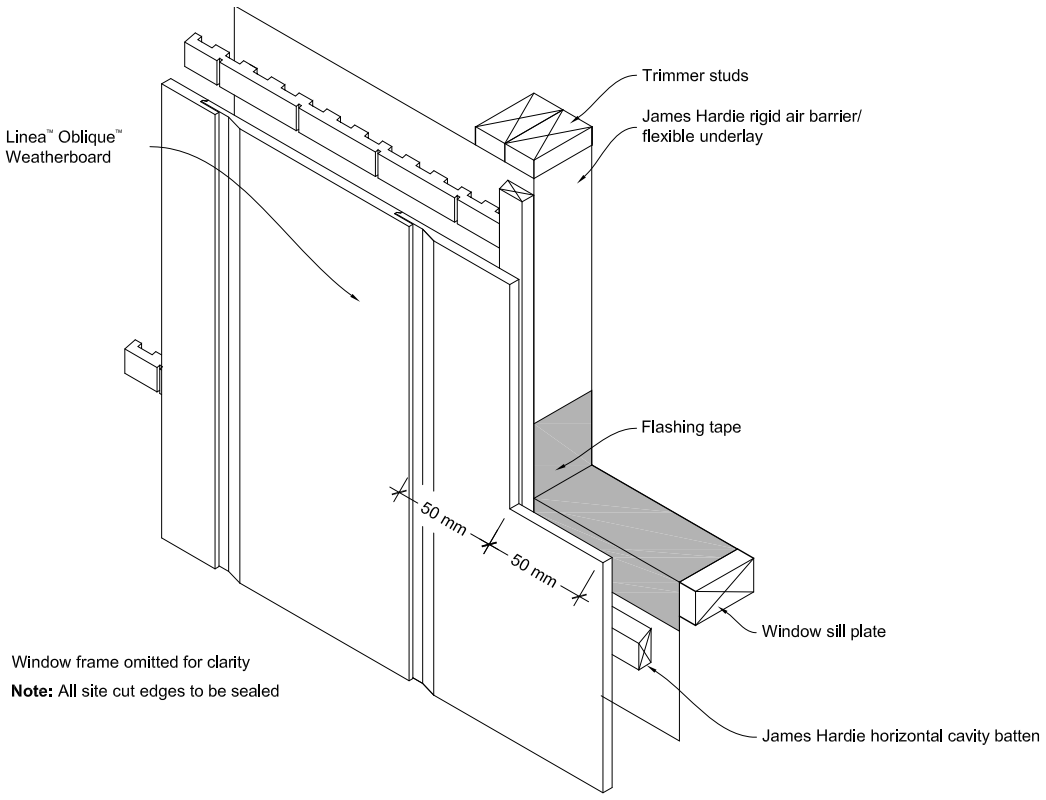


Figure 17: Over joist at floor level

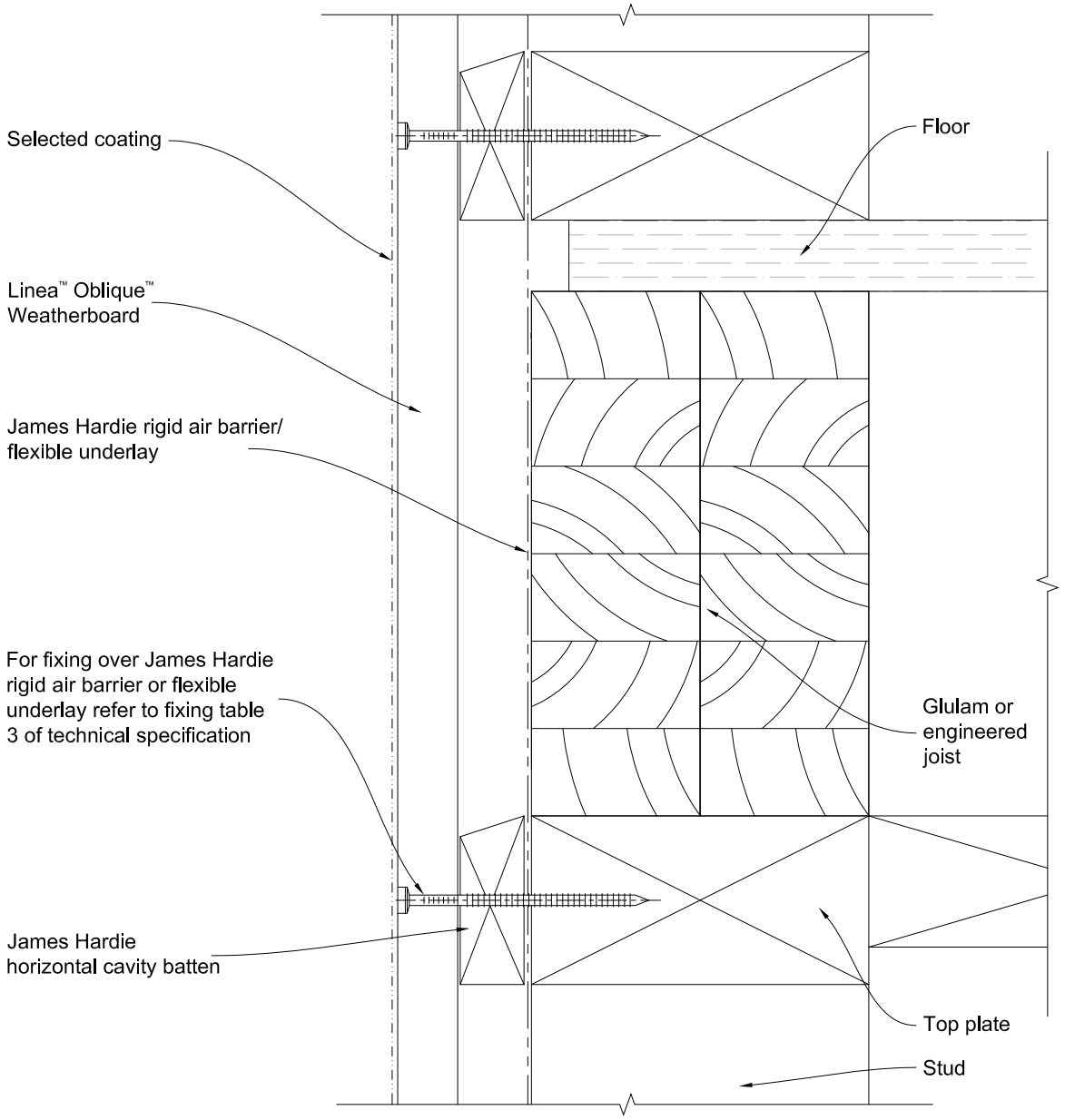


Figure 18: Butt jointing of Vertical Linea Oblique Weatherboard

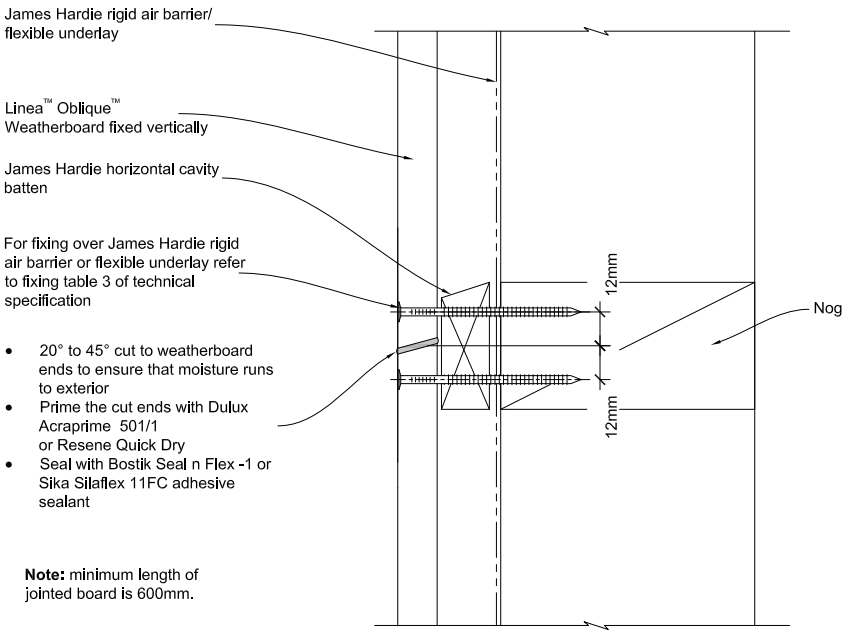
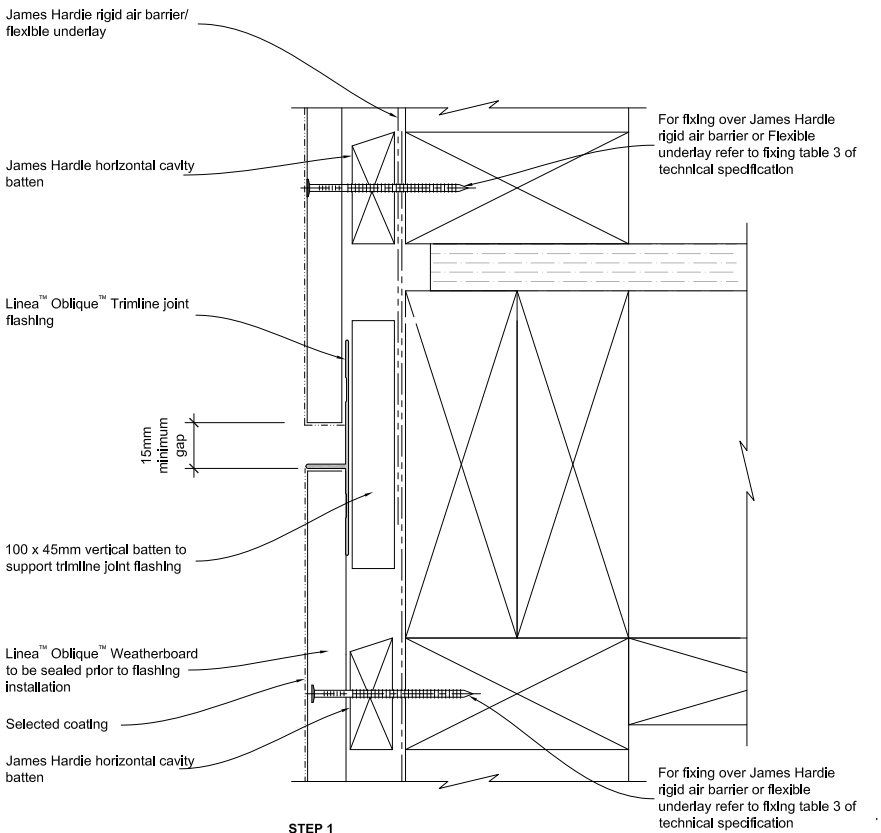


Figure 19: Trimline flashing joint at floor level



STEP 1

STEP 1

- Ensure flat James Hardie rigid air barrier / Flexible underlay is in place.

STEP 2

- James Hardie horizontal cavity batten to be installed over the studs and nogs. - Nylon strapping intermediate support to hold insulation in place between studs.

STEP 3

- Install the lower weatherboards with aluminium trimline flashing.
- Install the upper weatherboard keeping a 15mm gap.

Notes:

- The aluminium trimline flashing is installed prior to weatherboard. Apply two 6mm thick lines of adhesive sealant on the bottom portion of aluminium trimline flashing to seal. Take care to ensure continuous seal is formed between weatherboard and aluminium trimline flashing.
- The sealant must continue between flashing flange and weatherboard edge.
- Install purpose-made jointer 50mm over each end of trimline flashing and seal with flexible sealant to prevent water ingress.

Figure 20: Trimline flashing joint external corner

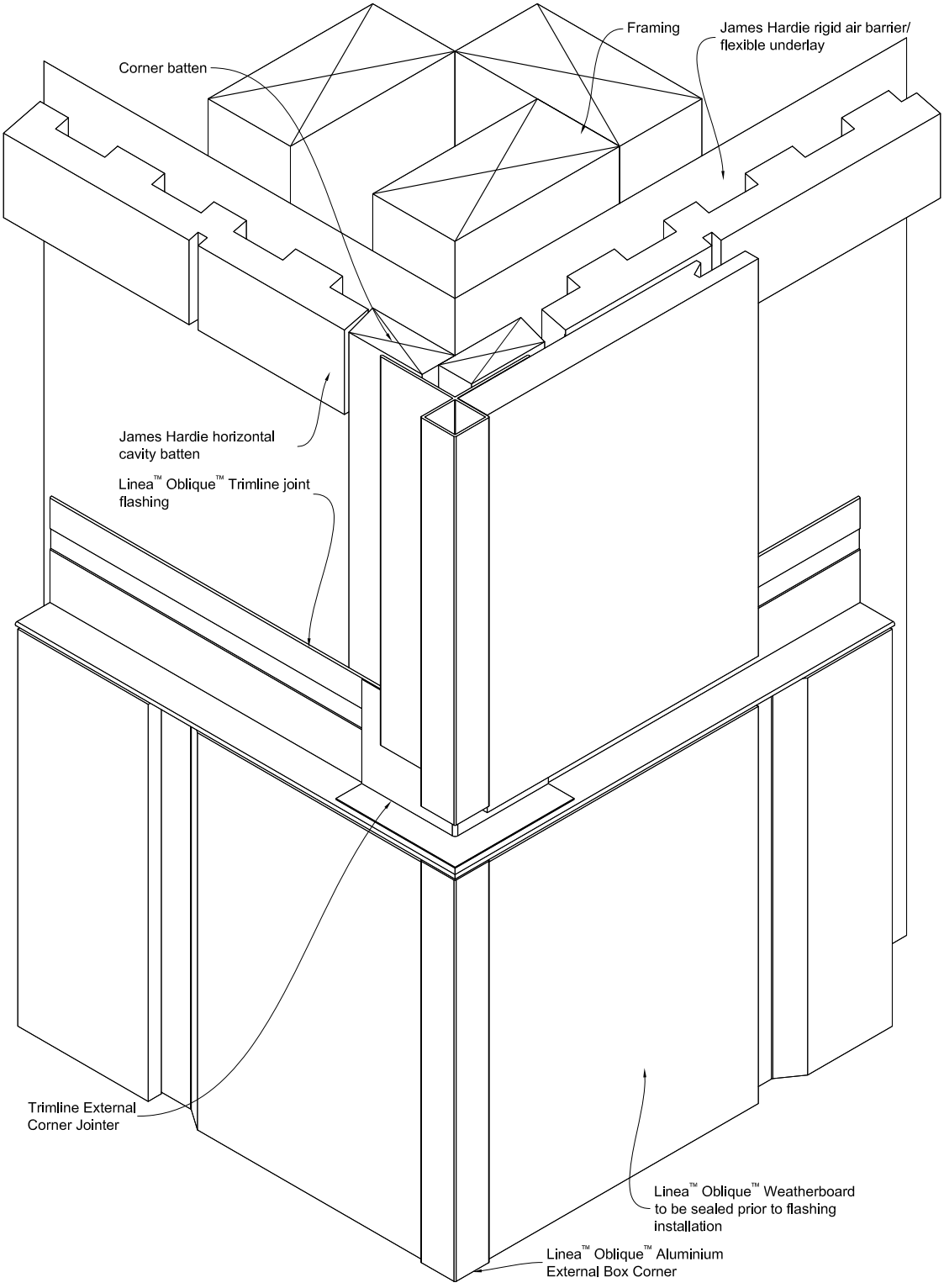


Figure 21: Trimline joint

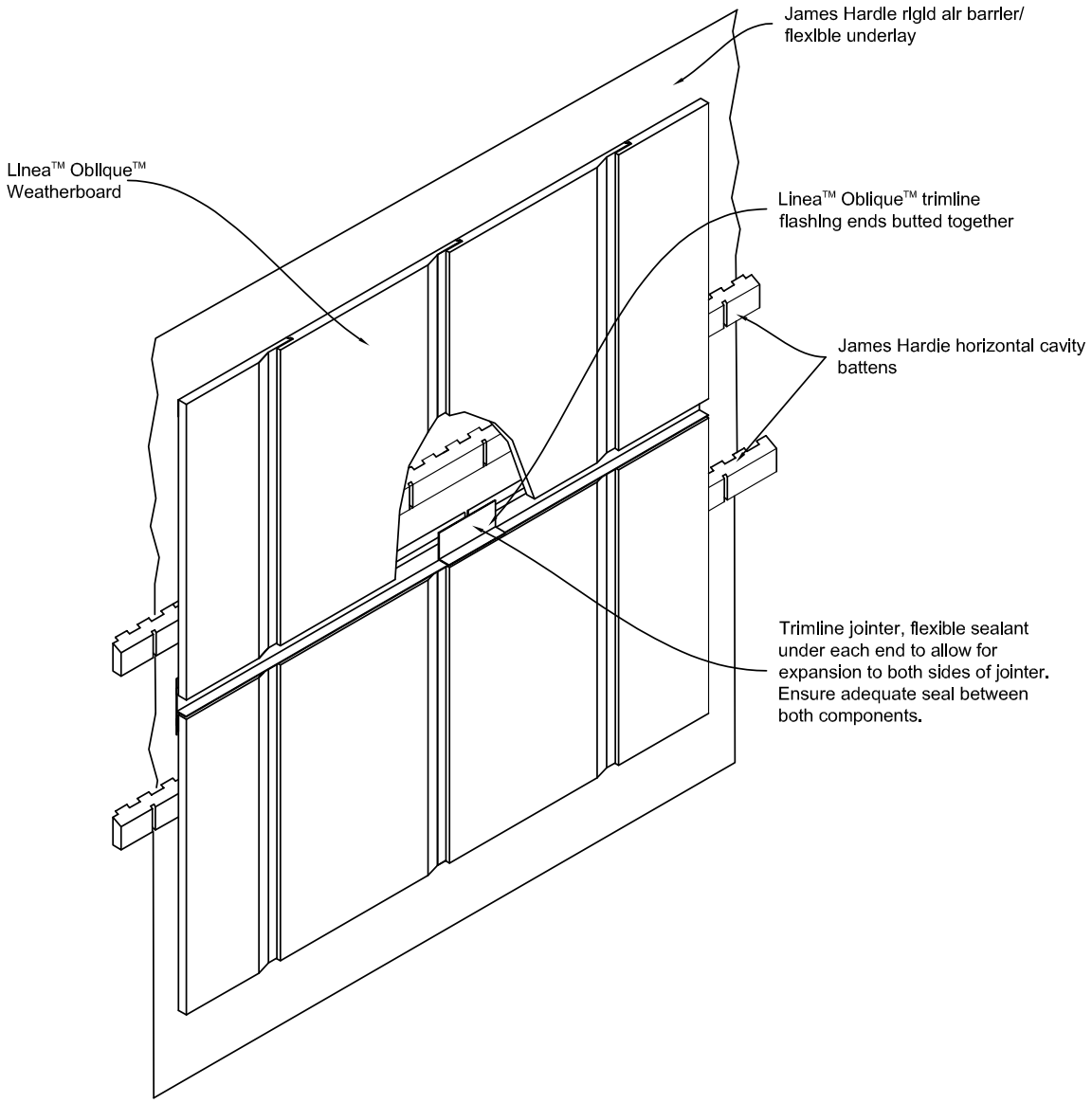
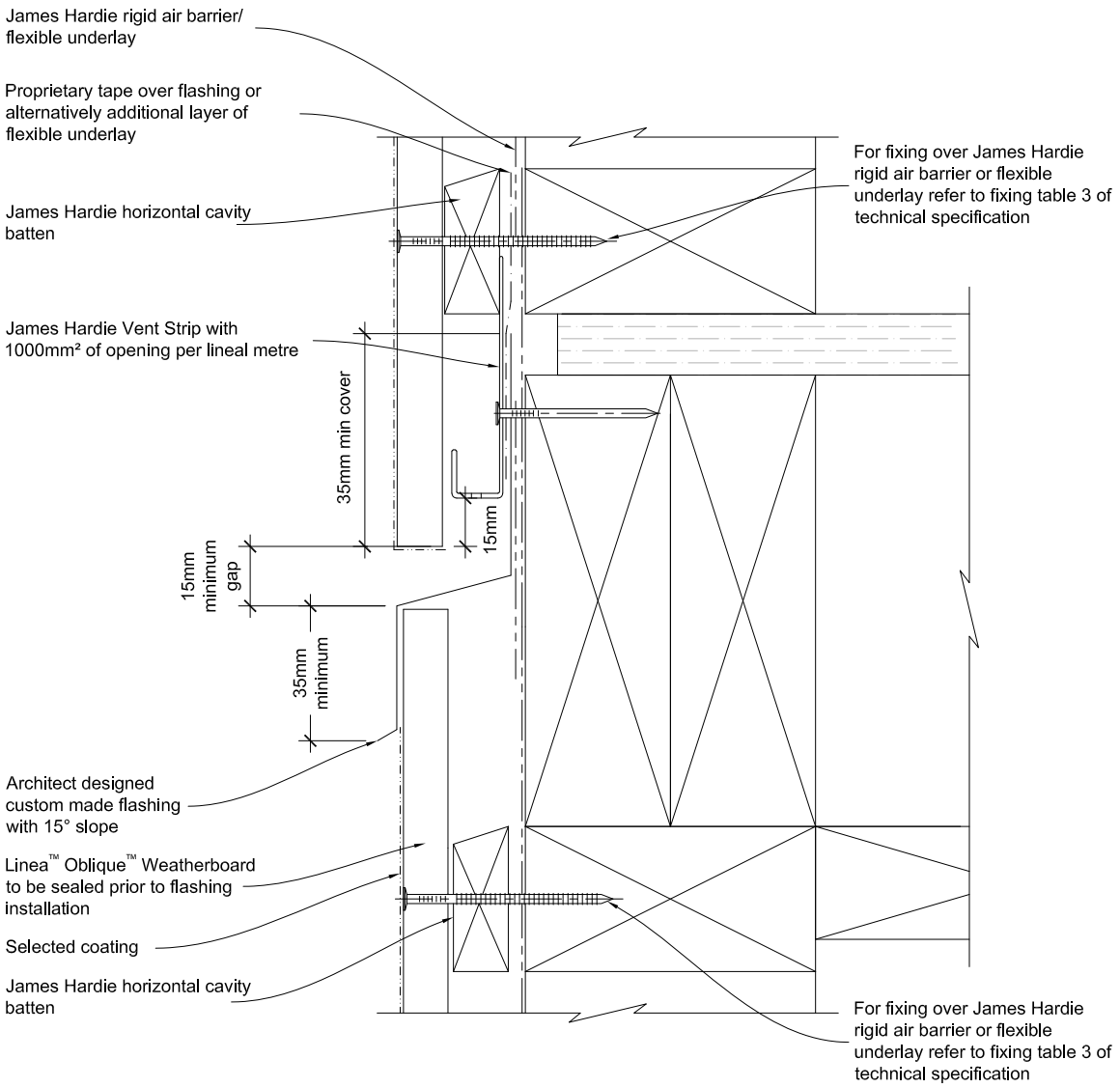


Figure 22: Drained flashing joint at floor level



Note:
This detail is required to limit cavities to a maximum of 2 stories or 7 metres
Refer to E2/AS1 clause 9.1.9.4

STEP 1

- Check architect's plans for the type of flashing to be used

STEP 2

- Check fixing centres and edge distances
- If top fixings are to be hidden by the Z flashing they will need to be fixed and sealed before the Z flashing is installed
- Cut edges need to be primed with Acraprime sealer or similar

STEP 3

- When 50 year durability is required refer Table 20 E2/AS1

STEP 4

- The flashing to be placed in the centre of the floor joists. Do not fix James Hardie horizontal cavity batten or cladding into floor joists

Figure 23: Drained flashing joint at floor joist

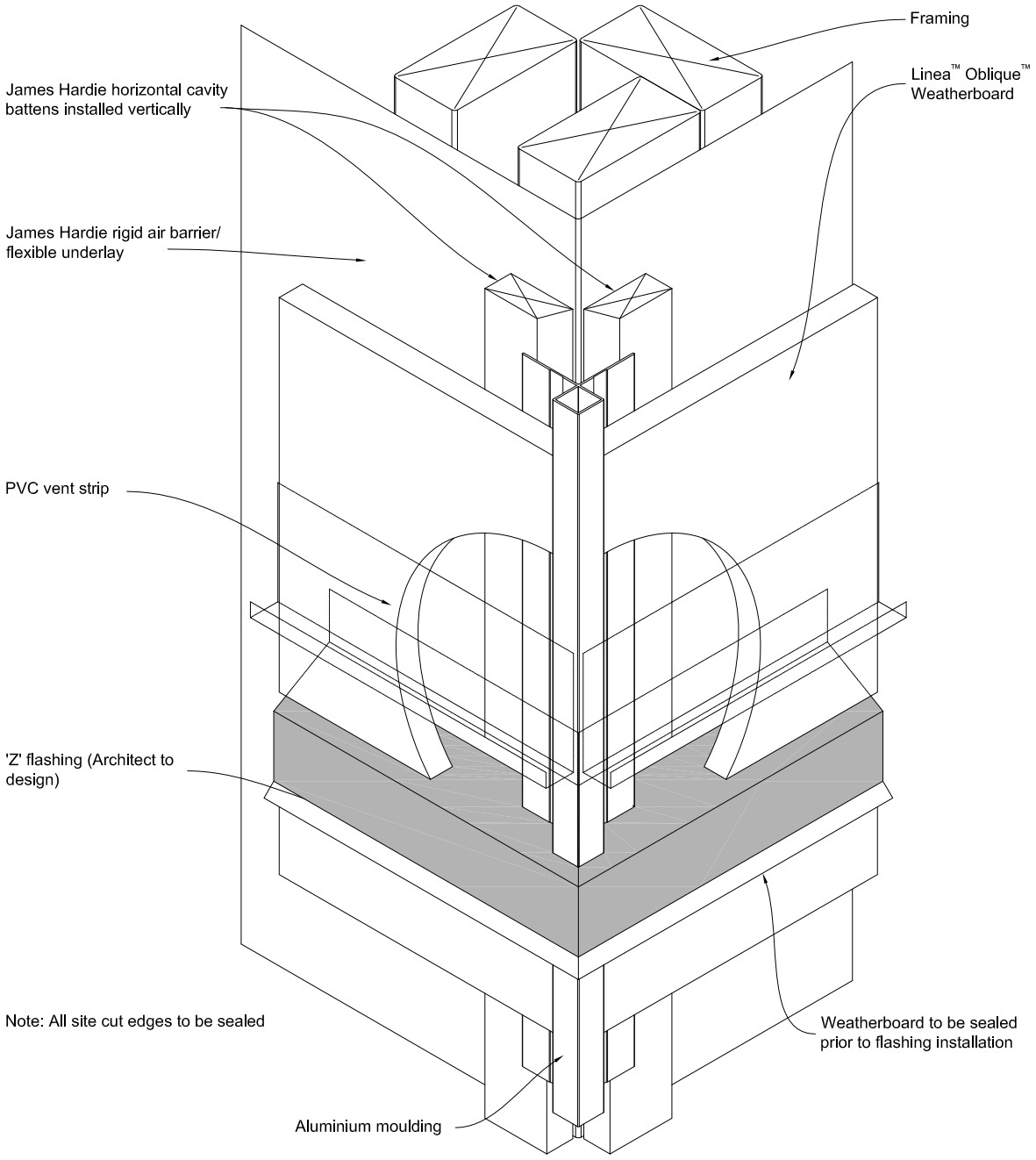


Figure 24: Apron flashing detail

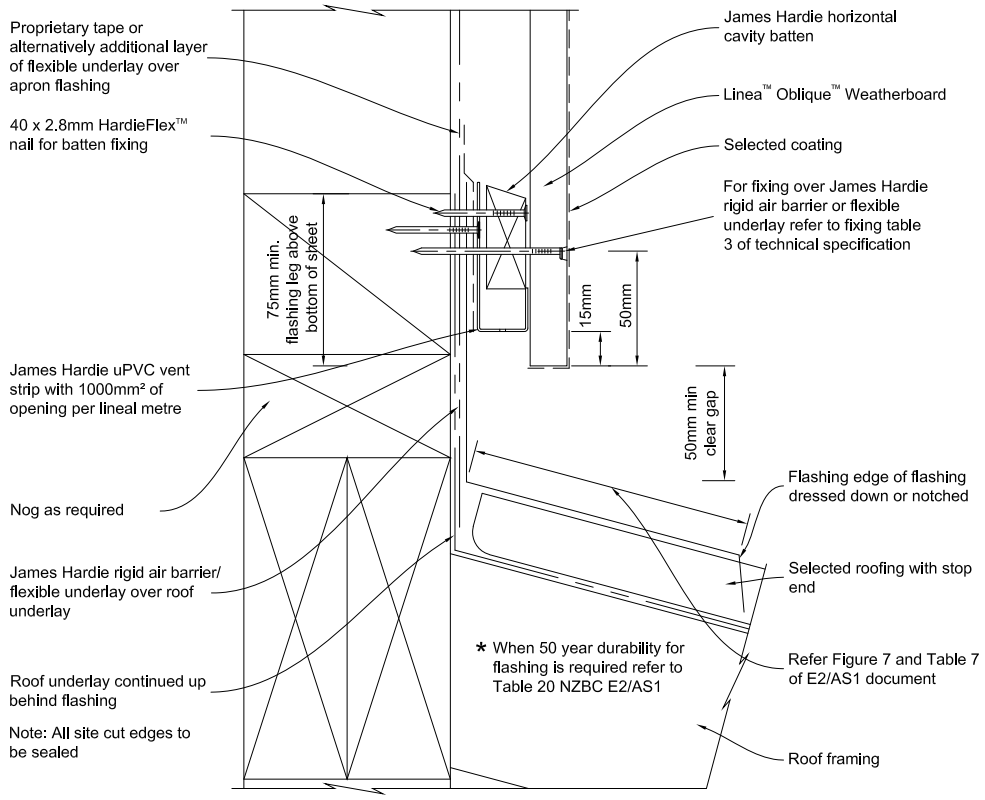


Figure 25: Parapet flashing

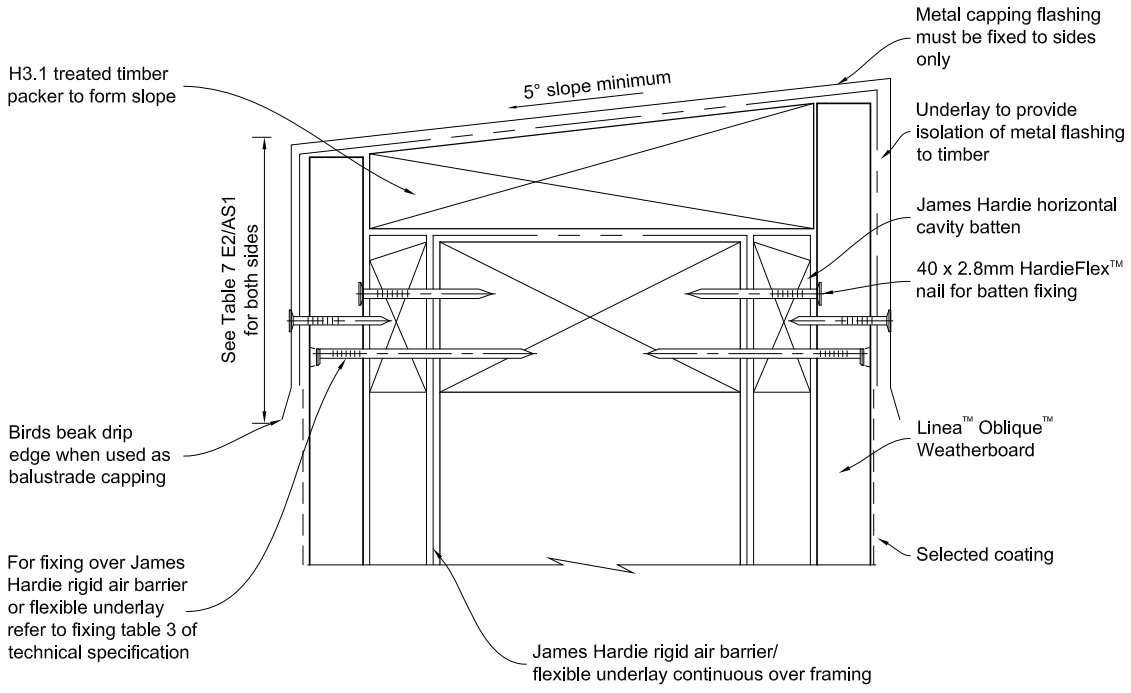


Figure 26: Roof to wall junction detail

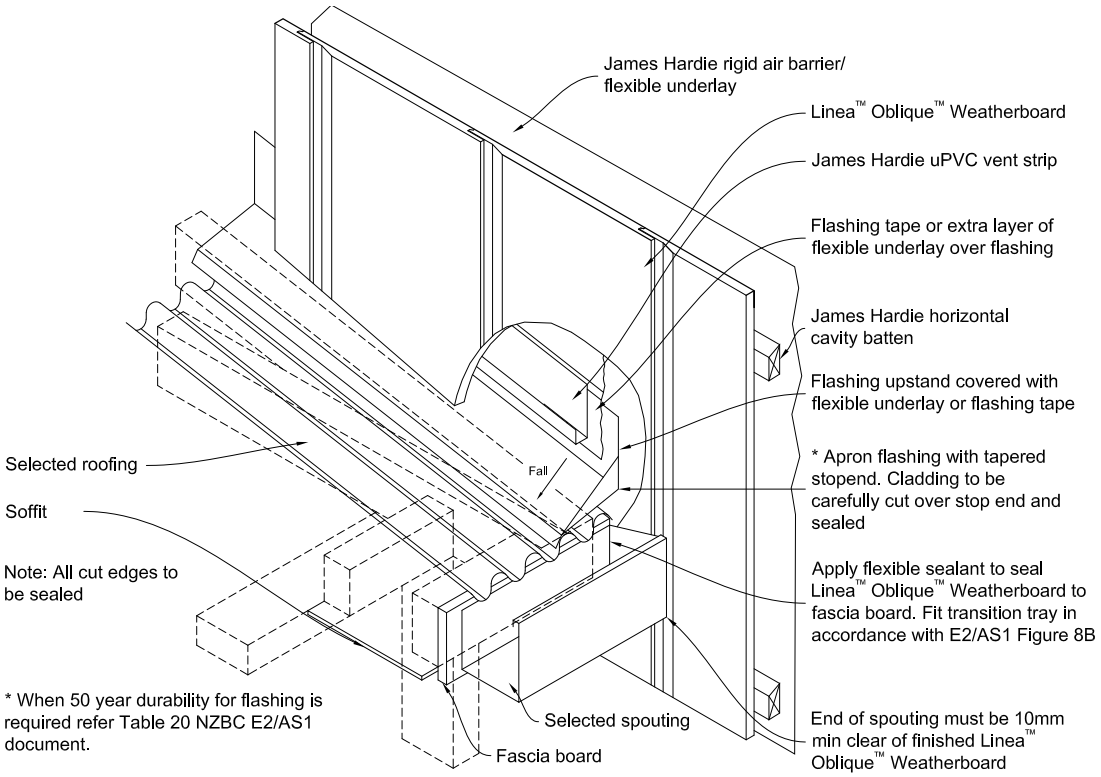


Figure 27: Meter box at sill

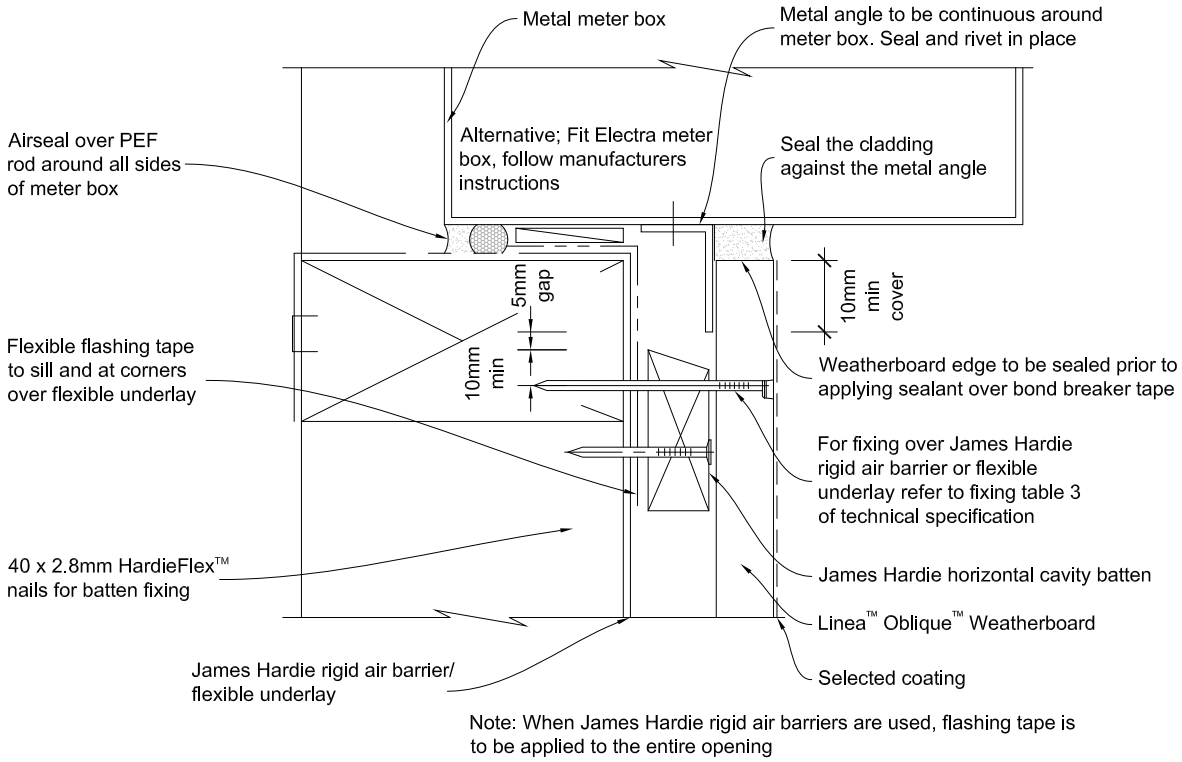


Figure 28: Meter box at jamb

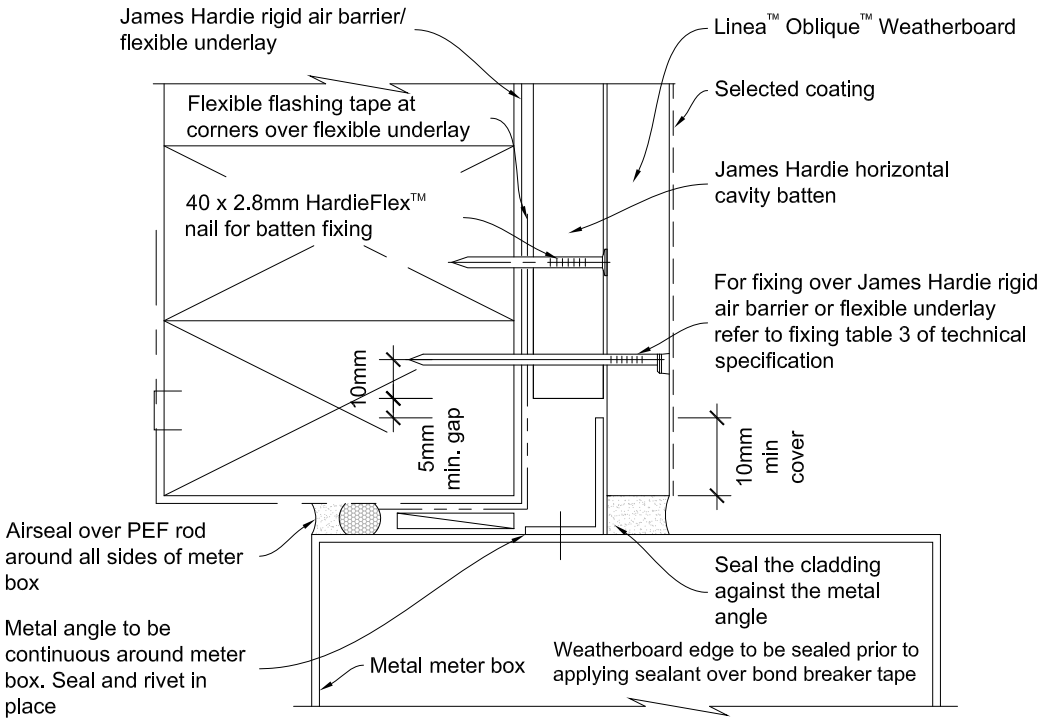
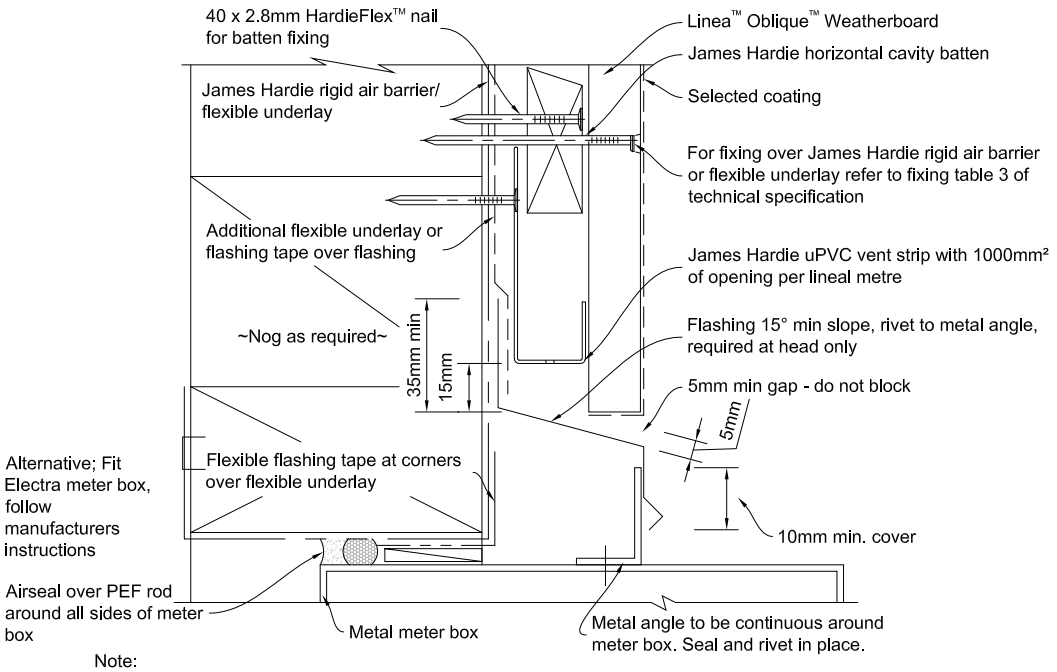


Figure 29: Meter box at head



Note:

- When James Hardie rigid air barriers are used flashing tape is to be applied to the entire opening.
- Sealant must be installed between head flashing and flange in VH and EH wind zones and SED projects.
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- All site cut edges to be sealed

Figure 30: Enclosed deck

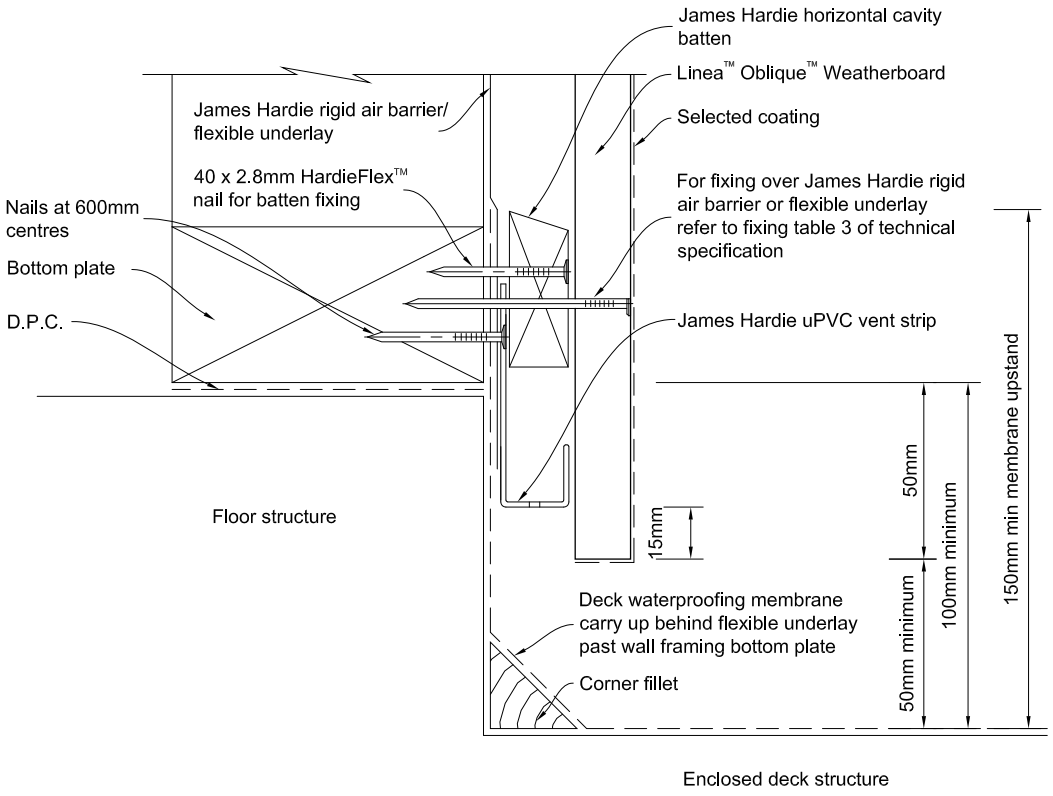


Figure 31: Pipe penetration

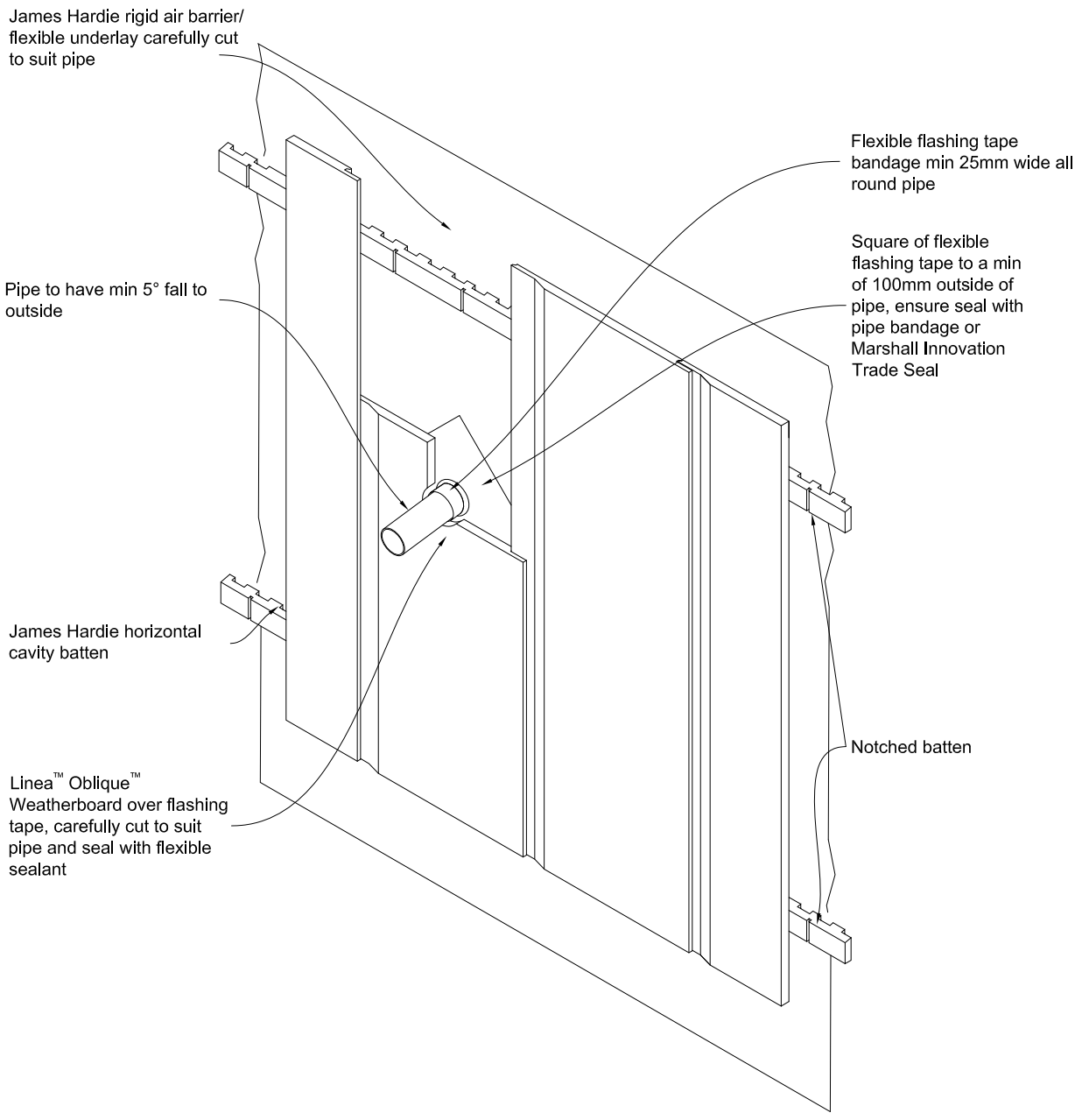


Figure 32: Cladding installed

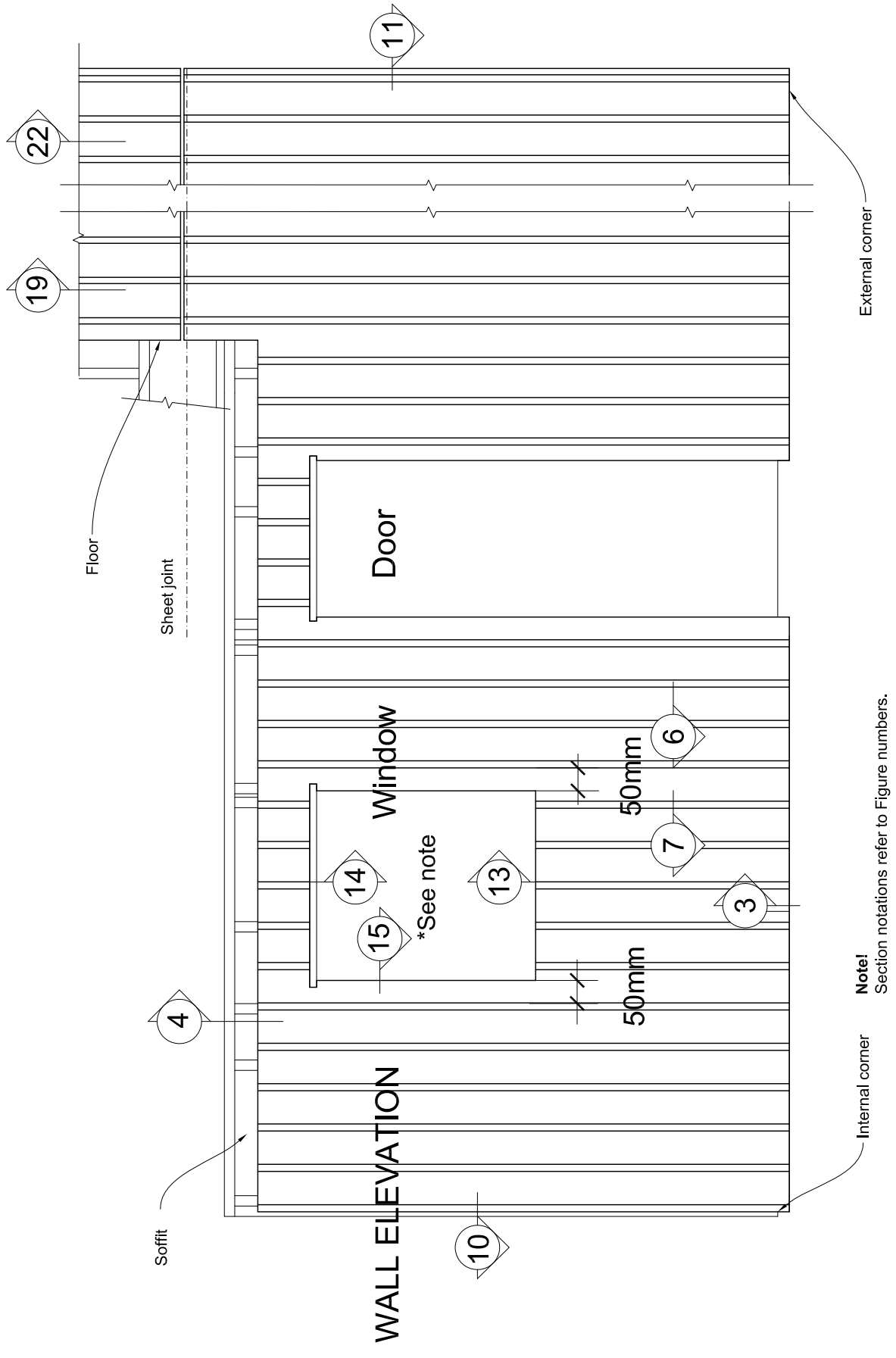


Figure 33: Garage head

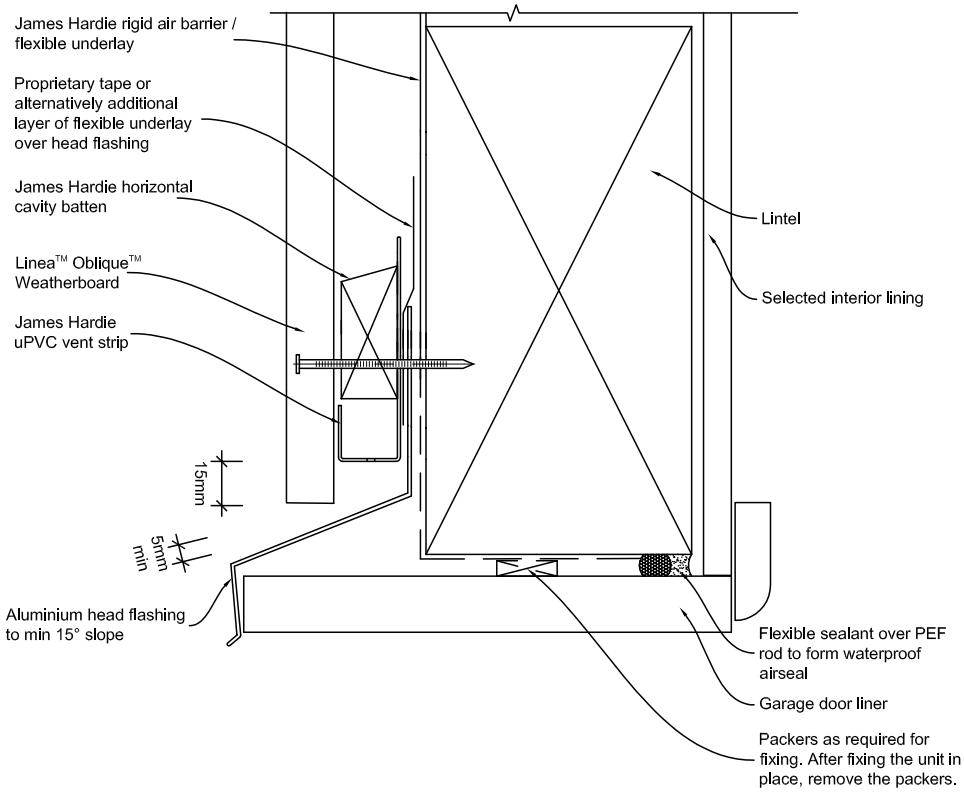
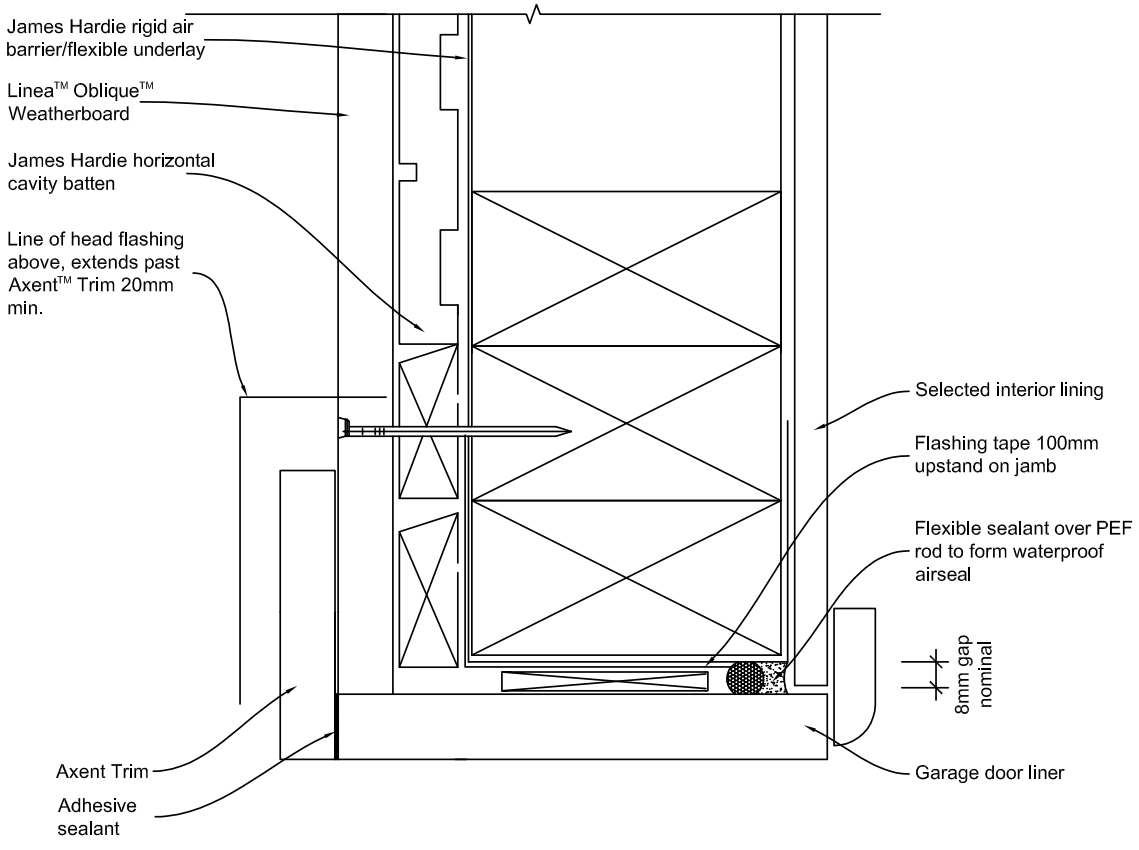


Figure 34: Garage jamb



Notes

Notes

Product Warranty

Linea™ Oblique™ WEATHERBOARD

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Oblique™ Weatherboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation;

b) this warranty is not transferable;

c) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice;

d) the project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards;

e) the claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product;

f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces);

g) all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;

h) if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. Linea™ Oblique™ Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with the Linea™ Oblique™ Weatherboard Vertical Installation technical specification. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

James Hardie

Ask James Hardie™ | Call 0800 808 868 | jameshardie.co.nz

WET WALL LINING

CBI 5113

March 2007

GIB Aqualine®
Wet Area Systems

www.gib.co.nz

Introduction

MARCH 2007

THIS PUBLICATION

This publication is not intended as the definitive guide on wet area construction and wet area systems, but rather as a helpful guide to best practice around areas where there is intermittent water exposure and splash zones within residential and non-residential buildings – in particular, areas covered by the New Zealand Building Code (NZBC), Clause E3 Internal Moisture.

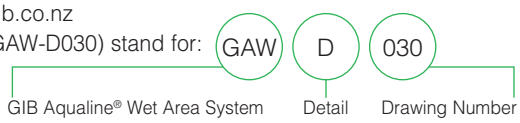
The information herein is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZBC and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

It is important to introduce materials and systems which have been specially designed to cope with the conditions that are common in wet areas, and to ensure they are installed correctly, using best practice, and are compatible to form a complete wet area system.

The code numbers shown with each "typical detail", e.g. GAW-D030, match the code numbers for drawings available as downloads on the GIB® website at www.gib.co.nz

The reference numbers (e.g. GAW-D030) stand for:



WHAT IS A WET AREA?

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Wet areas fall into two categories; these are well explained and documented in the NZBC, Clause E3.

1. Water splash areas – These are areas subject to intermittent splash of liquid water around sanitary fittings and appliances such as baths, vanities, laundry tubs, sinks, etc. These areas are required to have an impervious, easily cleaned surface.
2. Shower enclosures – These are areas subject to more frequent, larger quantities of water, and include shower enclosures and shower over bath areas. The NZBC E3/AS1 requires these areas to be impervious, and specifically excludes any paint and wallpaper finishes. Where ceramic tile or stone finishes are applied, E3/AS1 requires that they "shall be laid on a continuous impervious substrate or membrane".

The requirements of these wet areas are described on page 6 of this publication and in full in Clause E3 of the NZBC. Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management, which will require separate consideration. Ongoing maintenance of wet areas is also important to maximise the life of the wet area.

GIB AQUALINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or moisture.

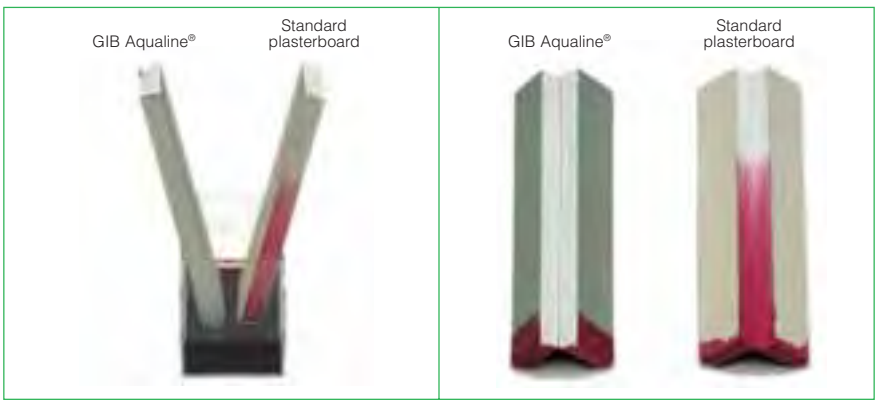
The NZBC does not call for water resistant linings in wet areas but it is highly desirable to incorporate lining materials which will maintain their integrity longer when exposed more frequently to water or steam and particularly to one-off events such as leakages or flooding of a room.

GIB Aqualine® is ideal in such situations because it features a water resistant wax polymer impregnated core.

Unlike other commonly used substrates, the GIB Aqualine® core not only resists penetration of water through the lining into the framing behind, but also resists water "wicking" up the core, a common cause of long-term damage where a water resistant lining has not been used.

GIB Aqualine® will maintain its integrity for extended periods, particularly where wicking over large areas can destroy the integrity of the interface between the lining and paint or wallpaper surfaces or between the lining and the tile adhesive.

The illustrations below graphically show the difference between GIB Aqualine® and standard plasterboard after a two-hour soak test in red dye.



Introduction/Design Considerations

GIB AQUALINE® *continued*

Where to Use GIB Aqualine®

Though not required by NZBC, it is highly desirable to include GIB Aqualine® in all areas at risk of water or moisture damage, in order to prolong the life expectancy of that space.

They include:

	WALLS	CEILINGS
BATHROOMS	✓	✓
SHOWERS	✓	✓
LAUNDRY	✓	✓
KITCHEN	✓	
TOILET	✓	

Benefits

- Water resistant and durable to help protect against water damage
- Proven substrate for paint, wallpaper, tiles, sheet vinyl and rigid sheet shower linings with installations in over 300,000 bathrooms in New Zealand
- Suitable for both residential and non-residential applications
- Dimensionally stable, will not buckle or warp, hence an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains fibreglass and other additives for strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB® Noise Control Systems (see Compliance with the NZBC, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details
- Green face paper for ease of recognition.

Sheet Dimensions and Weights

SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE AND TE/TE)		MAXIMUM WEIGHT/m²
Thickness (mm)	**Length (mm)**	
10	2400, 2700, 3000, 3600	7.8kg
13	2400, 2700, 3000, 3600	10.2kg

Handling and Storage

- GIB Aqualine® must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB Aqualine® must be handled as a finishing material.

APPRAISAL

The document entitled *GIB Aqualine® Wet Area Systems* 2007 has been appraised by BRANZ, Appraisal Certificate, No. 427 (2007).

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC)

Structure – Clause B1

The design and material specification for steel and timber framing used in GIB Aqualine® systems must be in accordance with the performance requirements of NZBC Clause B1 (Structure). See Bracing in Wet Areas on page 5.

Durability – Clause B2

When installed and maintained in accordance with this literature, GIB Aqualine® tiled or vinyl covered systems have a serviceable life of at least 15 years. They comply with the requirements of NZBC Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB Aqualine® systems have a serviceable life of at least 50 years and comply with NZBC Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

Spread of Fire – Clause C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZBC Clause C3 (Spread of Fire). When GIB Aqualine® is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

Design Considerations

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COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC) *continued*

Internal Moisture – Clause E3

When installed in accordance with this literature, tiled or vinyl covered GIB Aqualine® systems may be used in areas directly exposed to liquid water, such as showers, to provide an impervious and easily cleaned wall surface. These systems comply with the requirements of NZBC Clause E3 (Internal Moisture).

Hazardous Building Materials – Clause F2

At no stage during handling, installation, or serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZBC Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

Ventilation – Clause G4

NZBC Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

Airborne and Impact Sound – Clause G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZBC Clause G6 (Airborne and Impact Sound). When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline 0800 100 442.

LIMITATIONS

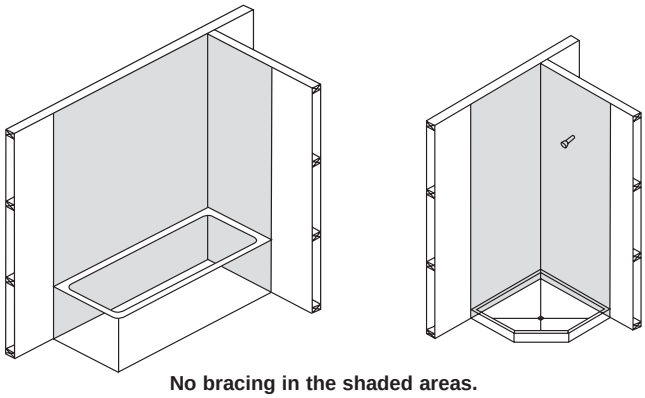
- GIB Aqualine® must not be used for bracing purposes in shower cubicles or above baths (see Bracing in Wet Areas below)
- Do not use GIB Aqualine® where it may be exposed for extended periods to humidities of 90% RH and above. Such areas include group shower or steam rooms as well as moisture and chlorine rich environments such as indoor swimming pools
- GIB Aqualine® must not be directly applied to solid plaster (gypsum or cement), wood based sheet linings or similar materials, masonry or concrete. GIB Aqualine® may only be applied to these materials where timber strapping or steel furring channels are installed
- GIB Aqualine® must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details.

BRACING IN WET AREAS

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members.

Otherwise, GIB® Bracing Systems can be used in water-splash areas as defined by NZBC Clause E3/AS1, provided these are maintained impervious for the life of the building.

GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100mm centres, using the GIB Braceline® corner fixing pattern.



No bracing in the shaded areas.

Design Considerations

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NEW ZEALAND BUILDING CODE

E3.3.4 requires impervious and easily cleaned surfaces to all surfaces adjacent to sanitary fixtures or laundering facilities.

E3.3.5 requires that surfaces of building elements likely to be splashed or contaminated in the course of the intended use of the building must also be impervious and easily cleaned.

E3.3.6 requires that surfaces of building elements likely to be splashed must be constructed in a way that prevents water from penetrating behind linings or into concealed spaces (e.g. wall cavities).

Walls in wet areas therefore need to be addressed according to whether they fall within the scope of one of the following descriptions:

1. Wall surface likely to be splashed
2. Shower walls. Although not a requirement of NZBC it is highly recommended that the wall surfaces within 150mm of the top edge of a bath, and the vertical faces immediately under the edge of a bath, are treated in the same way as for a shower wall.

WALL SURFACES IN AREAS LIKELY TO BE SPLASHED

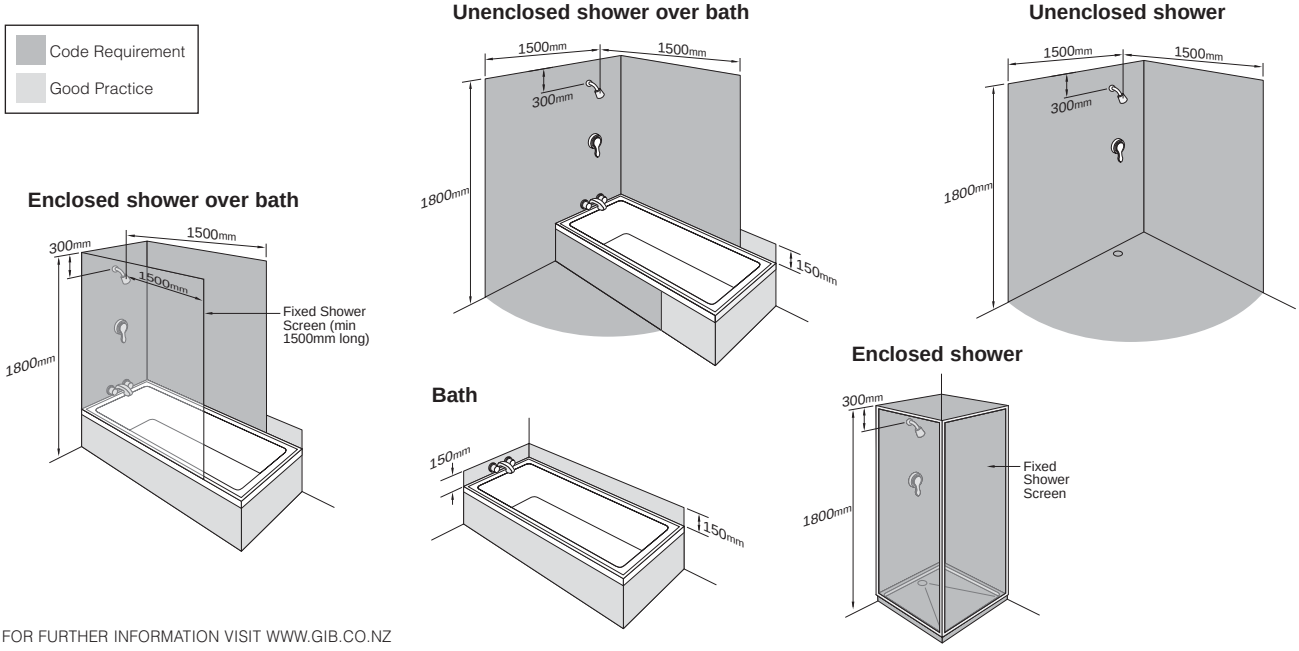
Suitable linings include:

a. Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints
b. Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use
c. Cement based solid plaster or concrete having a steel trowel or polished finish (semi-gloss or gloss paint must be used if a paint finish is required)
d. Cork tile or sheet sealed with waterproof applied coatings
e. Monolithic applied coatings having a polished, non-absorbent finish (e.g. terrazzo)
f. Sheet linings finished with vinyl coated wallpaper, or semi-gloss or gloss coating
g. Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin
h. Modular or multiple lining units which are themselves *impervious* and easily cleaned, and are installed with *impervious* joints
i. Timber or timber-based products such as particleboard sealed with waterproof applied coatings.

NB: Floor surfaces and floor/wall junctions are required by E3 to be impervious.

SURFACES IN SHOWERS AND AROUND BATHS

Suitable linings include all of the above, but **NOT including items (d) and (f) from the above list.**
Note that a waterproof membrane complying with AS/NZS 4858: 2004 **MUST** be applied to all lining materials used under ceramic tiles in these areas.
The waterproof membrane must extend to a 1500mm horizontal radius from a shower rose unless the shower is contained within a fixed enclosure. A shower curtain does not constitute a fixed enclosure.
Particleboard manufacturers recommend that in wet areas, panels should be protected with a suitable wet area membrane or an integrally waterproof sheet material. Some local authorities call for this treatment on all timber based floors. Local requirements should be checked before proceeding.
Dark grey shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membranes prior to tiling. Light grey shaded areas represent good practice.



Design Considerations

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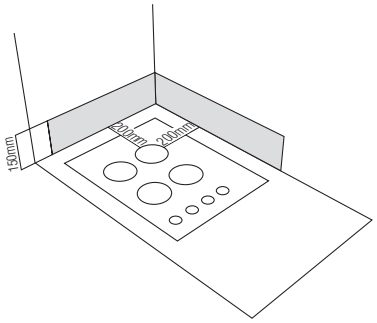
WALL SURFACES SURROUNDING COOKTOPS

The protection of combustible surfaces surrounding gas cooking appliances is covered by NZS 5261. Consult the current version of this standard to ensure compliance.

However, as a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm ceramic tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the requirements of Clause 2.6.2.6 of NZS5261.



Because of the moisture generated by cooking, it is highly recommended that GIB Aqualine® is used in kitchen areas.

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. However, it would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Sealants should be of a mould inhibiting type and be neutral cure. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Gun a bead of silicone sealant to the full depth of the GIB Aqualine® in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the GIB Aqualine®
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the GIB Aqualine® wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable then refer to the publication *Penetrations in GIB® Fire Rated Systems*. Always use tested and approved proprietary solutions.

WATERPROOF MEMBRANES

- A waterproof membrane must be applied to **all** lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane over the lining and the jointed areas shown shaded on page 6
- Only in-situ waterproofing materials which are manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and applied to manufacturer’s recommendations. Typically, these types of membranes are not suitable for paint and wallpaper finishes
- Waterproof membranes must be fully cured and dry prior to application of tiling adhesives
- Embed reinforcing mats in the membrane at all internal corners of the shower (including floor/wall junctions)
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this technical literature are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane.

TILING

GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10mm GIB Aqualine® up to 20kg/m^2
- 13mm GIB Aqualine® up to 32kg/m^2.

Note: Most ceramic and porcelain tiles weigh less than 20kg/m^2.

For further information on tiling consult the BRANZ *Good Practice Guide – Tiling*.

Design Considerations

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FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine® is a suitable substrate for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures for the GIB Aqualine® substrate shall be as per page 10 or 11, except that the lining gap at the floor should be reduced to 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles (32 x 32 x 0.55mm) behind internal GIB Aqualine® corners is recommended for sheet vinyl applications in showers or shower over bath situations (see illustration page 14)
- The GIB Aqualine® lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph through even a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended for the wall finish in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of the flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/manufacturers of the vinyl.

RIGID SHEET SHOWER LININGS

- The manufacturers/suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- **Do not preseal or paint** areas which are to be covered by the rigid shower linings
- The wall surface must be free of dust before installation of the lining
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service
- Care must be taken to ensure that rooms are adequately ventilated and the adhesive is fully cured before the shower is used
- Consult the manufacturer/supplier of the shower lining for full installation details.

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture within those spaces.
In most cases when renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them with GIB Aqualine®. This allows for a completely new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation and water resistant linings where appropriate
- Make the job easier.

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often very expensive failure of components and building elements within wet areas.
It is important to regularly inspect and repair any potential problem before it becomes a major problem and expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and recoated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out.

Non-residential and Apartments

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High-rise and commercial wet areas can generally be divided into four separate categories:

HIGH-RISE APARTMENTS AND INTERTENANCY

Wet areas in apartment complexes are generally covered by Clause E3 of the NZBC and will have the same requirements as shown for residential applications. However, apartment buildings will also involve intertenancy walls requiring noise control and fire resistance.

Generally, noise control and fire resistance are the first consideration and then the water resistance is added to those systems.

For noise control, GIB Aqualine® can substitute for the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®.

For fire resistance, GIB Aqualine® can substitute for GIB Fyreline® of equivalent thickness.

In all cases the prescribed noise control or fire resistance system specifications must be followed completely as presented in the GIB® publications *GIB® Noise Control Systems* and *GIB® Fire Rated Systems*.

Refer to typical details on page 25.

The NZBC for intertenancy calls for special consideration to be given to preventing water from travelling from one tenancy to another. This calls for a waterproof membrane to all wet area floors with upstands to walls and the inclusion of floor wastes.

It is important to avoid penetrations such as taps, shower roses, etc. in intertenancy walls as this will compromise fire and noise ratings.

OFFICE, WORKPLACE AND SCHOOLS

These wet areas are generally no different in requirements to those shown in this publication or those of high-rise apartments, and are treated in the same manner.

As there is often a higher impact requirement in commercial applications, 13mm GIB Aqualine® is the minimum thickness recommended.

These areas are often finished in sheet vinyl or ceramic tiles and GIB Aqualine® is an ideal substrate, particularly in the case of sheet vinyl where a high quality finish is required to minimise telegraphing of imperfections in the substrate.

HEALTHCARE AND HOSPITALS

This industry will generally have special requirements for wet areas. GIB Aqualine® will generally satisfy specific design needs in healthcare facilities and in particular is an ideal substrate for the preferred finish of sheet vinyl.

PUBLIC AMENITIES AND SPORTS CLUBS

Public amenities and sports clubs often have a high demand for impact resistance, therefore 13mm GIB Aqualine® should be used, and suitable impact resistant wall coverings considered, such as heavy duty sheet vinyl or ceramic tiles over waterproof membrane to 1200mm high.

Also full consideration should be given to the usage of the amenity and whether high pressure or chemical cleaners will be used or if the amenity may be subject to vandalism.

Because of extreme humidity and presence of chemicals, GIB Aqualine® is not suitable for enclosed swimming pool areas.

Contact the GIB® Helpline on 0800 100 442 for further assistance.

Non-tiled Walls – Timber Framing

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If bracing, noise control or fire rating considerations exist, consult the relevant GIB® technical publication, e.g. *GIB® Fire Rated Systems, GIB® Noise Control Systems, GIB® Bracing Systems*, for the appropriate information.

Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems.

Fasteners

- 10mm GIB Aqualine® – minimum 25mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails
- 13mm GIB Aqualine® – minimum 32mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails.

Fastener Centres

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element.

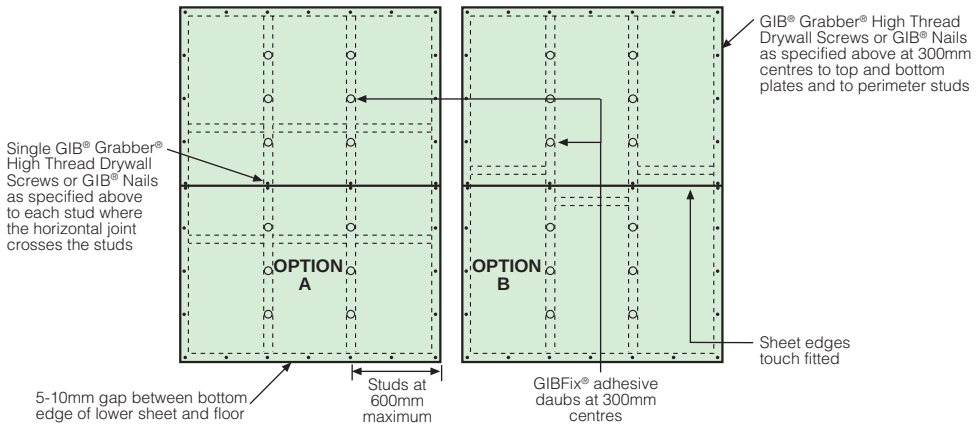
Lining

- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

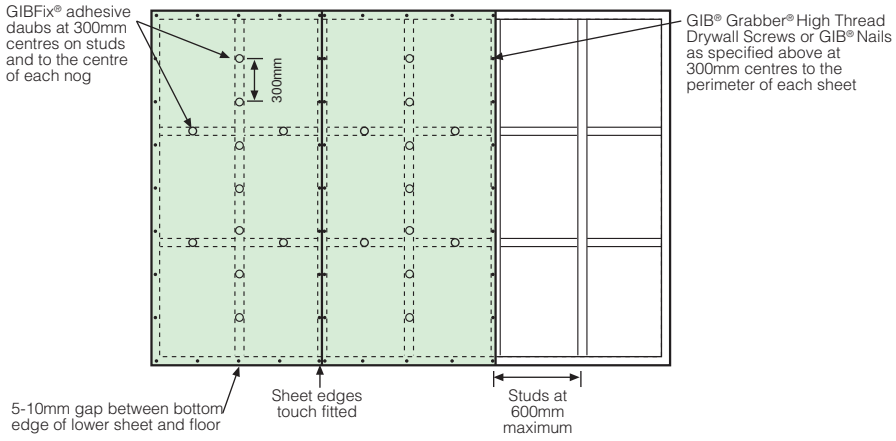
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*; GIB® AquaMix is recommended for the first two coats.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



Non-tiled Walls – Steel Framing

MARCH 2007

The minimum sheet thickness for fixing on light gauge steel framing is 13mm GIB® plasterboard.
Steel framing for residential construction is by specific design.
If noise control or fire rating considerations exist, consult the relevant GIB® technical publication (e.g. *GIB® Fire Rated Systems or GIB® Noise Control Systems)* for the appropriate information.

Wall Framing

- Steel stud dimensions to be minimum 63 x 34 x 0.55mm nominal with a 6mm return
- Steel channel dimensions to be minimum 63 x 30 x 0.55mm nominal
- Studs shall be spaced at 600mm centres maximum
- Ensure that the studs are placed with the open side facing in the same direction (see *GIB® Site Guide*).

Fasteners

- 25mm x 6g GIB® Grabber® Self Tapping Drywall Screws.

Fastener Centres

- 300mm centres to top and bottom channels and to end studs
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® All-Bond adhesive OR screws at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed.

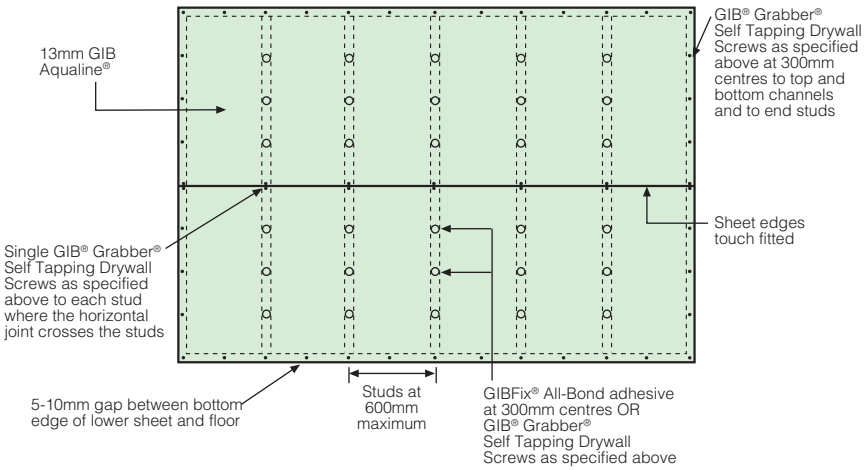
Lining

- Lay the sheets, leaving a 5-10mm gap at the floor line.
  Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry
- Sheets to be touch fitted.

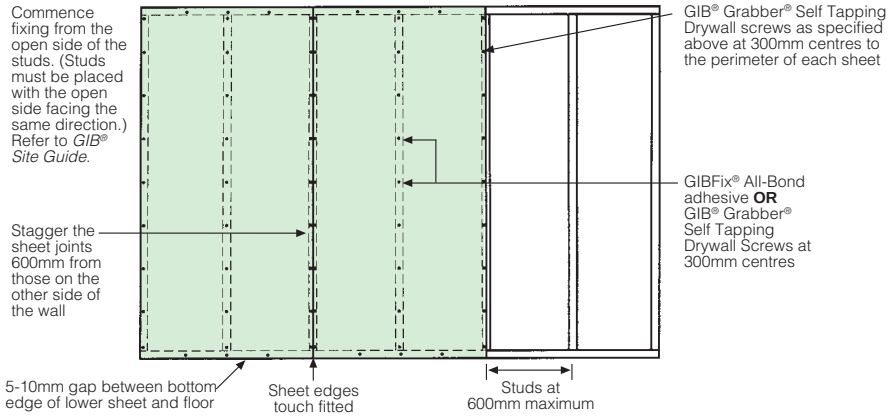
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*. GIB® AquaMix is recommended for the first two coats.

Fastening and Jointing the Linings – Horizontal Fixing



Fastening and Jointing the Linings – Vertical Fixing



Tiled Walls

MARCH 2007

Important: See page 6 and 7 for waterproof membrane requirements.

Wall Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle. Each side of the angle shall be fastened to the framing with 30mm galvanised clouts at 300mm centres
- Steel stud systems do not generally require nogs except as below:
  - Adjacent to each pipe penetration and behind sink and tub flashings
  - Between all studs above bath flanges and preformed shower bases
- For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require either vertical fixing of the GIB Aqualine® or the installation of some additional nogs.

Fasteners

- For 10mm GIB Aqualine® use minimum 25mm x 6g GIB® Grabber® Drywall Screws
- For 13mm GIB Aqualine® use minimum 32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

- GIB® Grabber® Drywall Screws at 100mm centres to perimeter of wall and to all intermediate studs
- Adhesive is not to be used in place of mechanical fastenings.

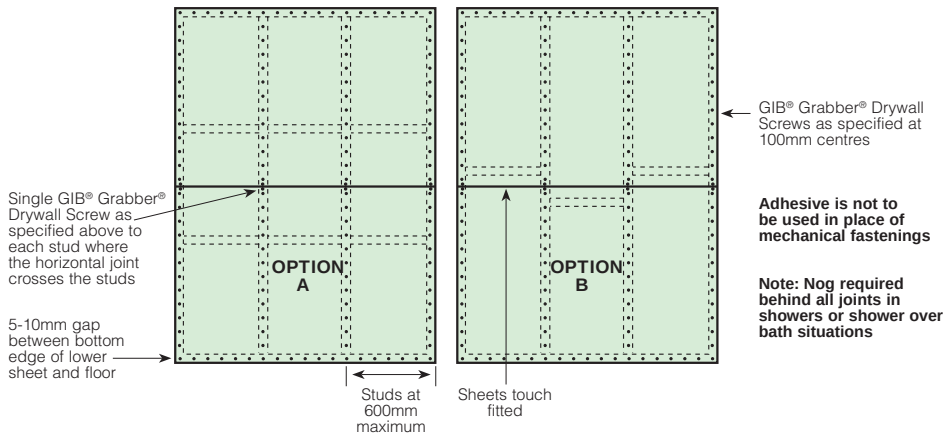
Lining

- 10mm or 13mm GIB Aqualine® is suitable for use on timber framing and for tile weights up to 20kg/m^2
- 13mm GIB Aqualine® must be used for tile weights between 20 and 32kg/m^2 and when light steel framing has been used
- GIB Aqualine® may be fixed vertically or horizontally
- Provide a 5-10mm gap at the wall/floor junction
- Provide a 5-10mm gap between the bottom edge of the GIB Aqualine® and any bath rim or preformed shower base to allow for placement of sealant
- GIB Aqualine® sheets shall be touch fitted
- Where the framing or fastener centres required for tiled areas are closer than those specified for GIB® Fire Rated and GIB® Noise Control Systems, the tiling specification shall prevail. Where relevant, check that fastener lengths comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems.

Jointing

- Jointing shall be carried out in accordance with instructions in the *GIB® Site Guide*
- Water resistant GIB® AquaMix is recommended for the first two coats
- No top coat is required.

Fastening the Linings – Horizontal Fixing in Tiled Areas



Note:

GIB Aqualine® is suitable for tiling to full height of walls, but if a wall is to be partially tiled (i.e. half high), only the area of wall under the tiles needs to be fixed as above. The remainder of the wall may be fixed as for non-tiled area (see page 10 & 11).

Ceilings

MARCH 2007

Ceiling Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.
If bracing, noise control, fire rating considerations exist consult the relevant GIB® publication for appropriate information.

Fasteners

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping Drywall screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber High Thread Drywall screws.

Adhesives

- Steel battens – GIBFix® All-Bond
- Timber battens – GIBFix® Wood Bond (not suitable for LOSP treated timber).

Fasteners Centres

- Single screws to the edges and centre of the sheets across each batten
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops.

Lining

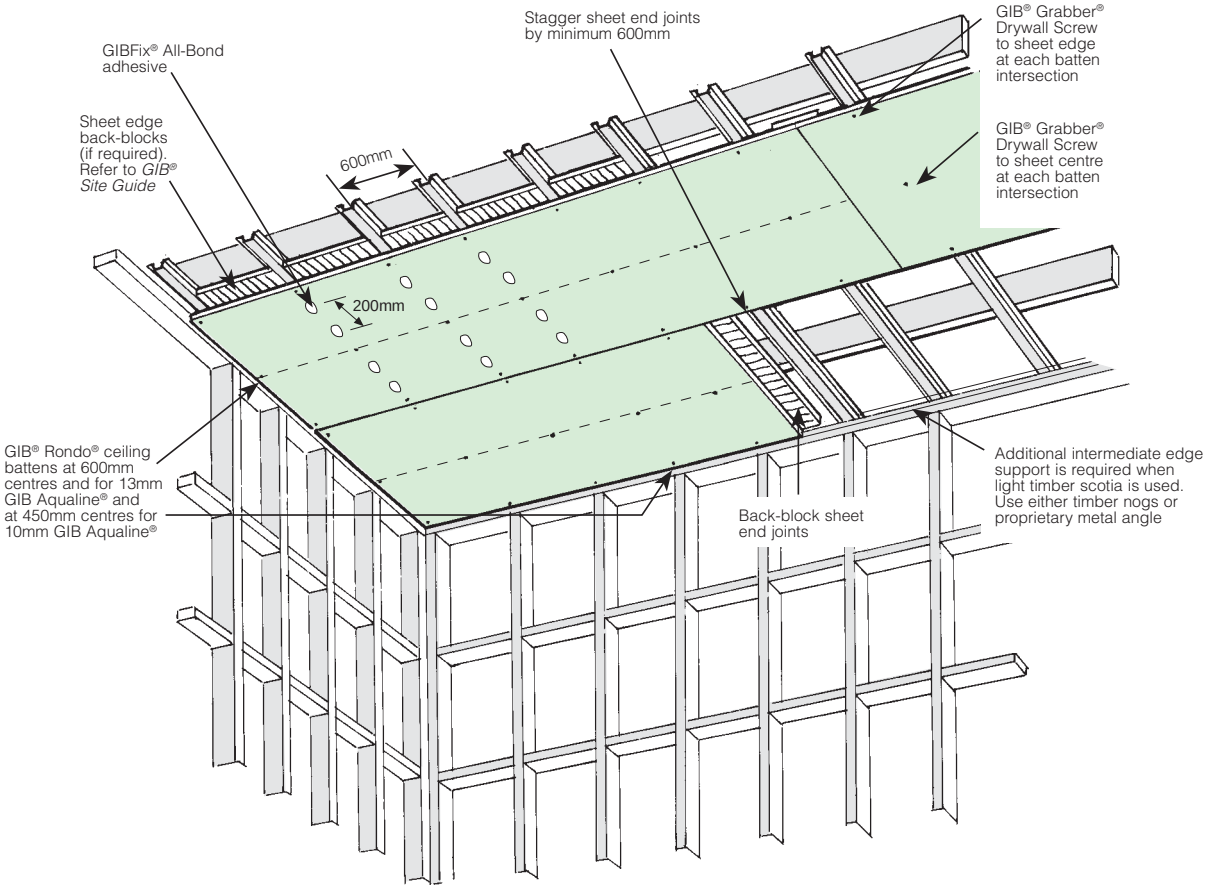
- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements.

Batten Spacings

- 13mm GIB Aqualine® plasterboard – 600mm centres max
- 10mm GIB Aqualine® plasterboard – 450mm centres max.

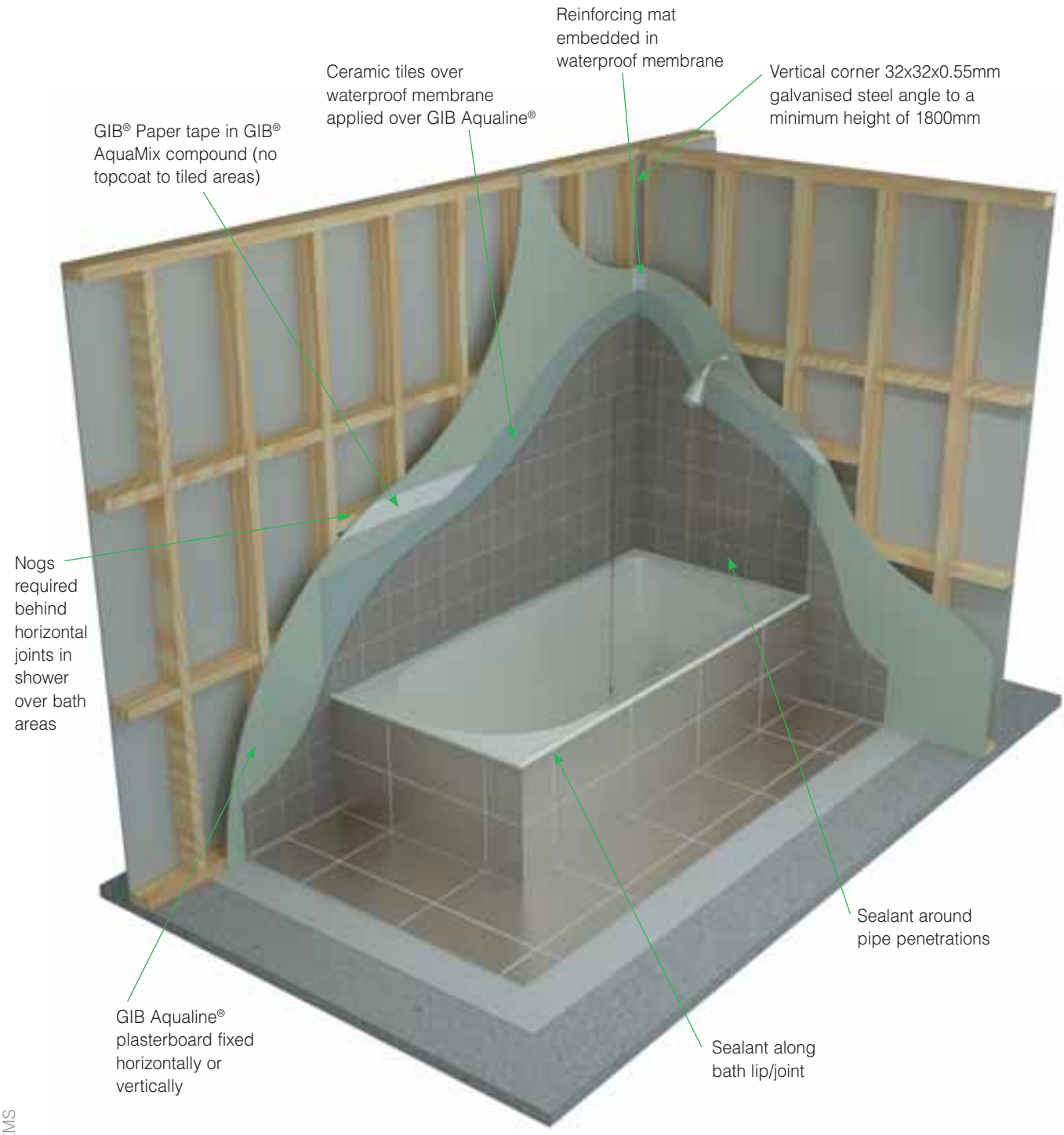
Jointing

- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the *GIB® Site Guide*. Water resistant GIB® AquaMix is recommended for the first two coats.
- Do not fix tiles to GIB® plasterboard ceilings.



Shower Over Bath – Tiled Walls

MARCH 2007



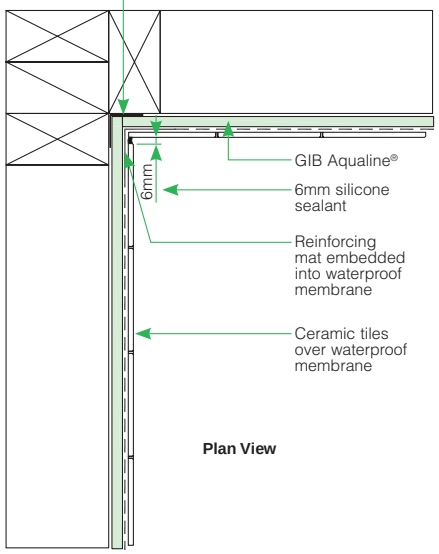
Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture.

For typical details, see the following pages.

Shower Over Bath – Tiled Walls

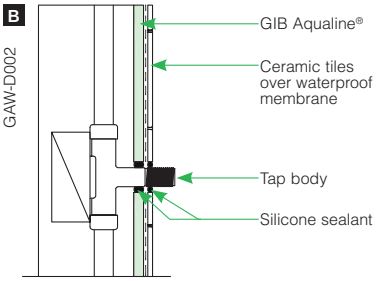
MARCH 2007

A GAW-D001



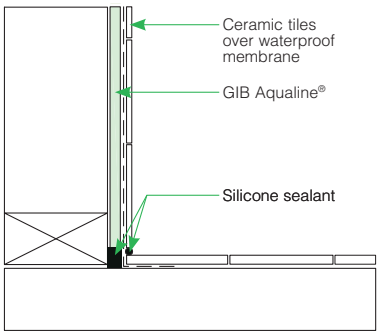
Plan View

B GAW-D002

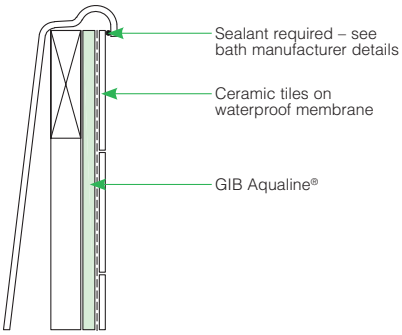


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

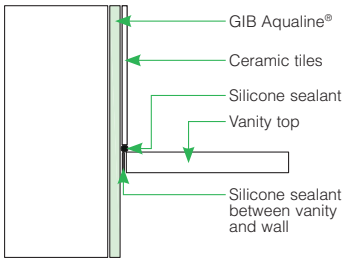
C GAW-D003



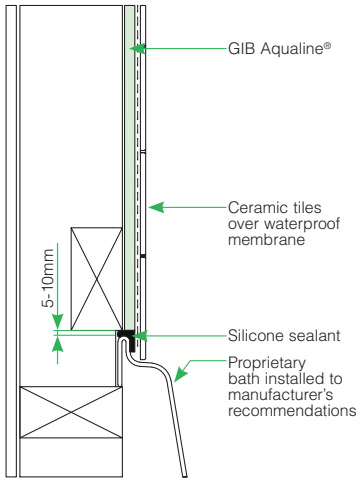
D GAW-D004



E GAW-D005



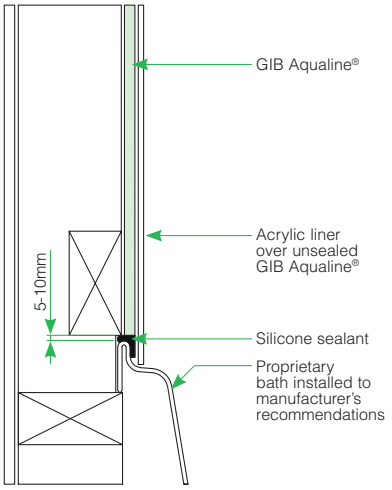
F GAW-D006



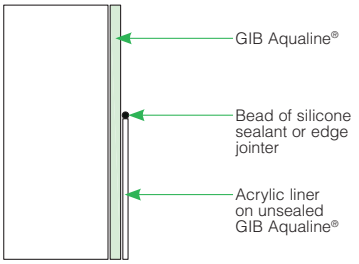
Shower Over Bath – Acrylic Liner

MARCH 2007

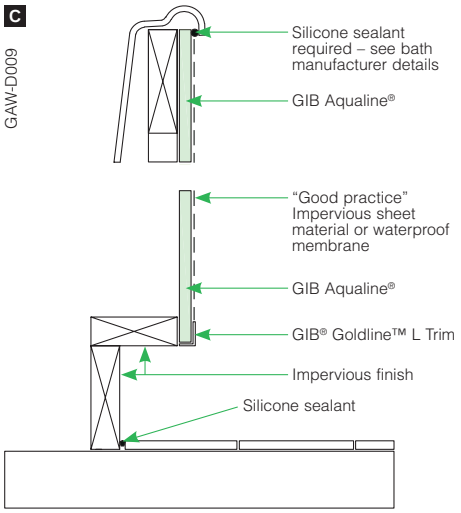
A GAW-D007



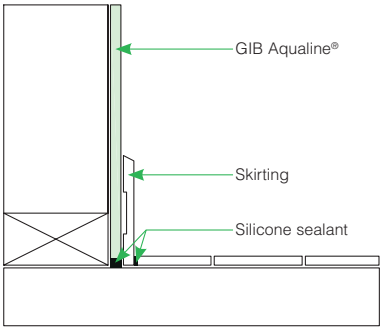
B GAW-D008



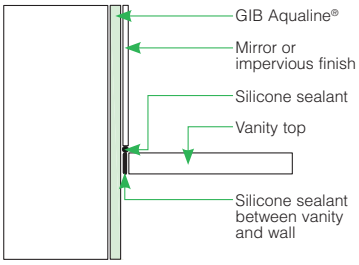
C GAW-D009



D GAW-D010



E GAW-D011



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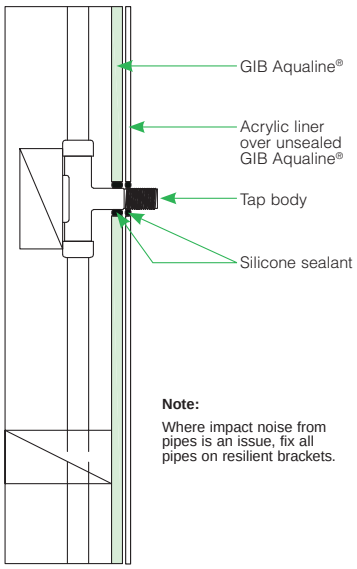
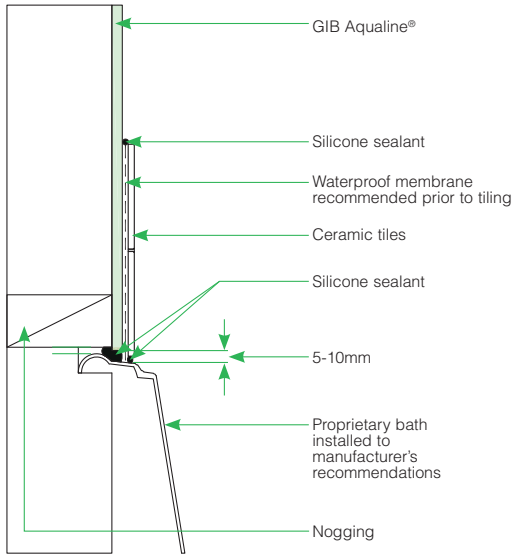


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

Bath – Tiled Upstand

MARCH 2007

A GAW-D013



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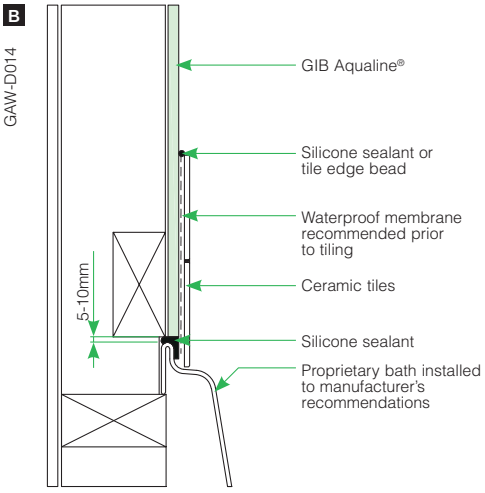

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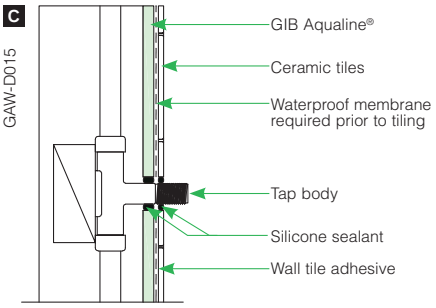
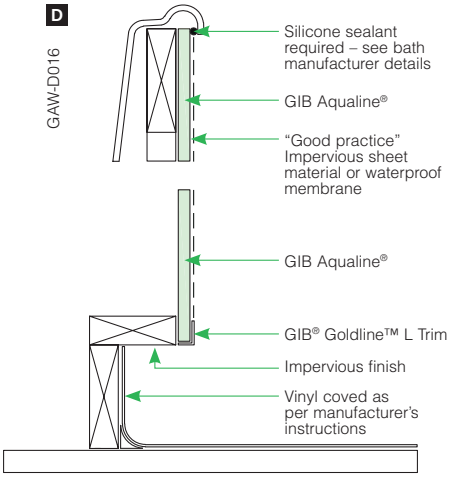
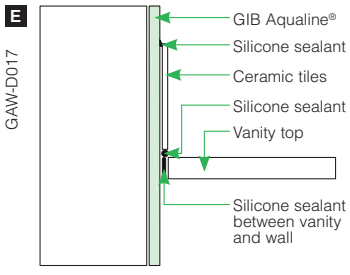


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

D GAW-D016

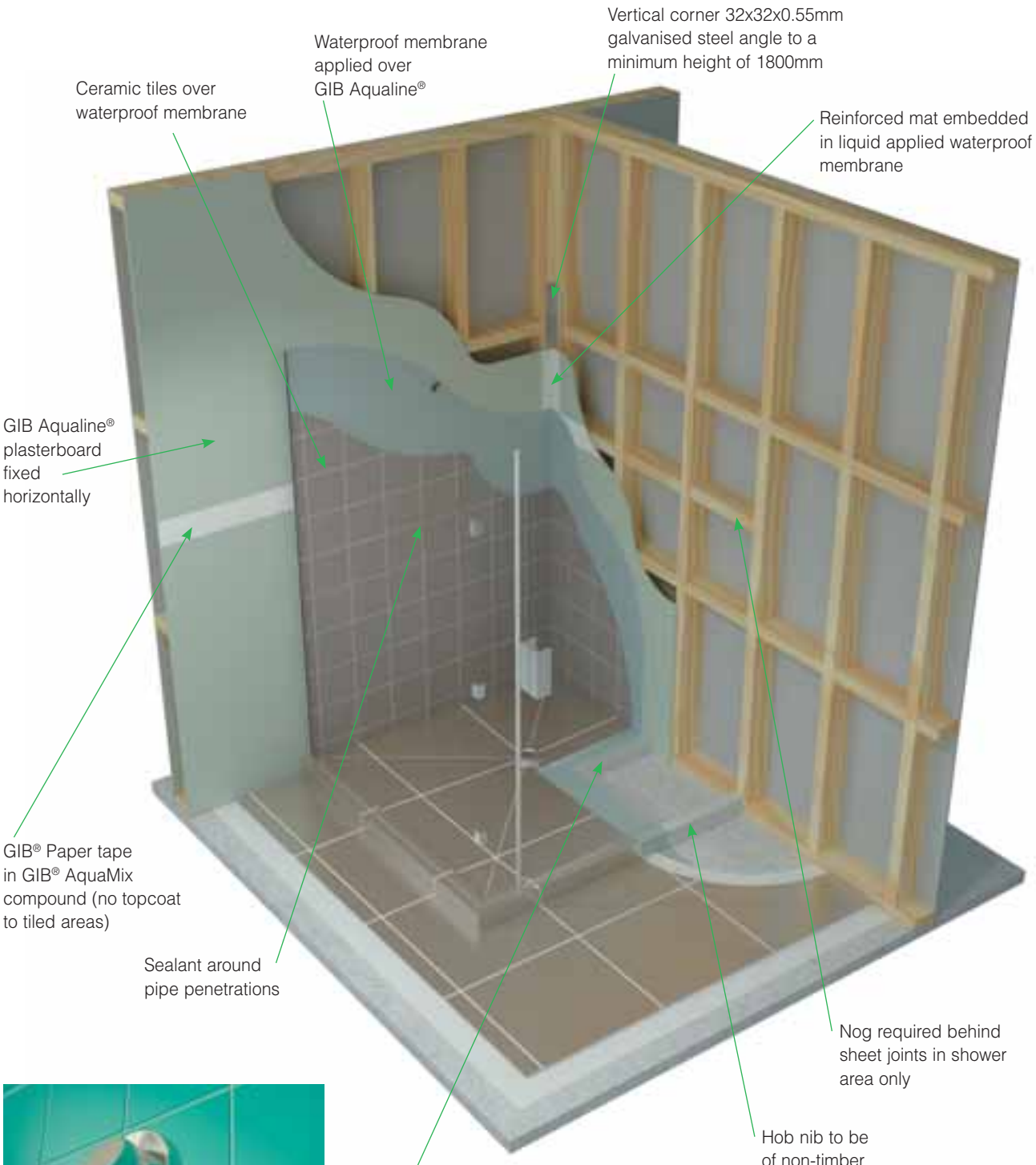


E GAW-D017



Shower – Tiled Walls and Base

MARCH 2007



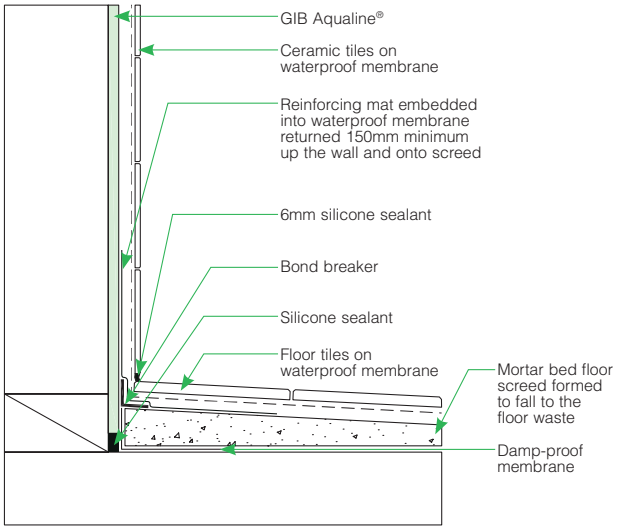
Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture.

For typical details, see the following pages.

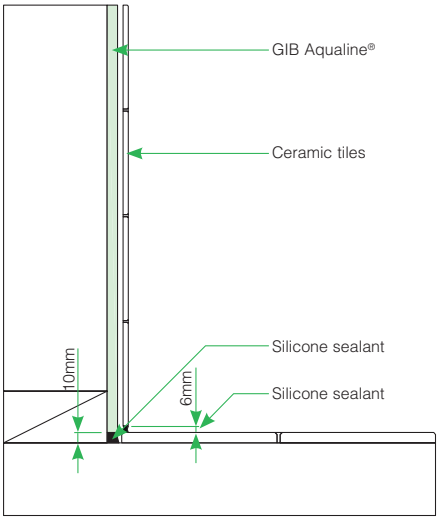
Shower – Tiled Walls and Base

MARCH 2007

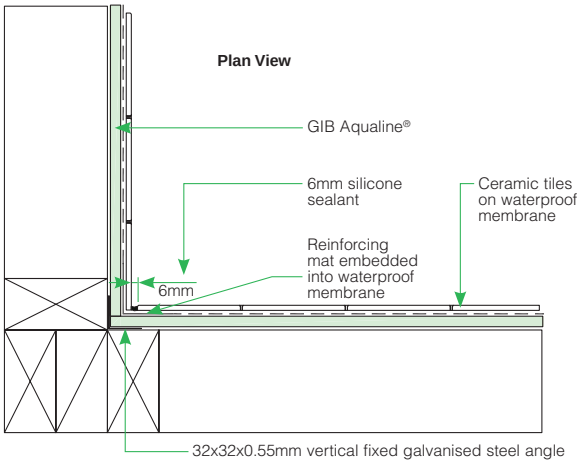
A GAW-D018



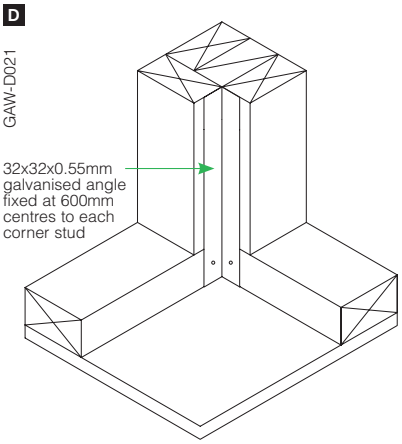
B GAW-D019



C GAW-D020



D GAW-D021



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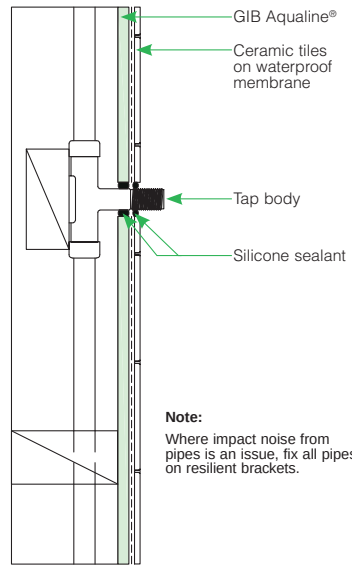
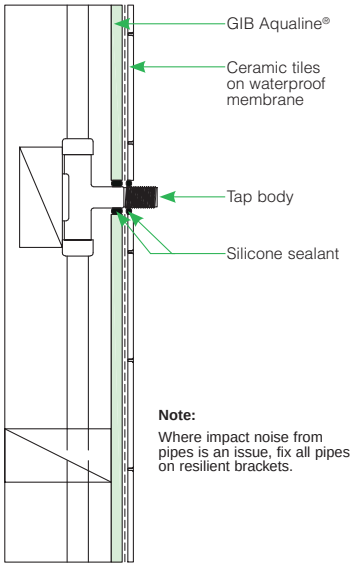


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

Shower – Tiled Walls and Acrylic Base

MARCH 2007

A GAW-D023



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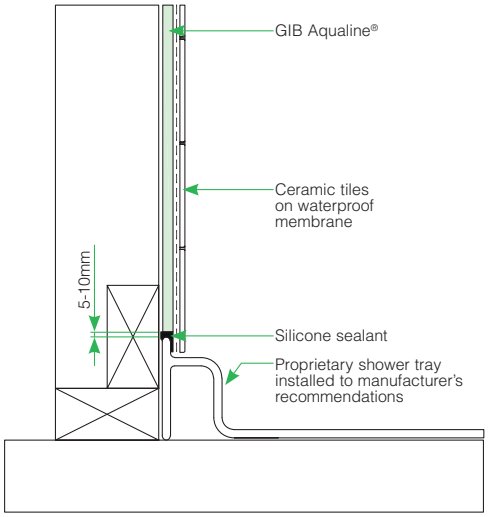

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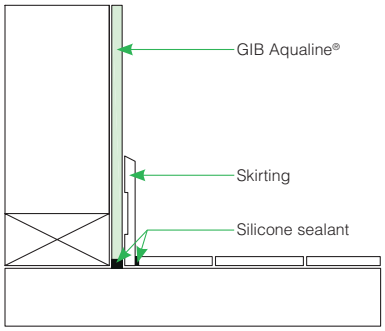
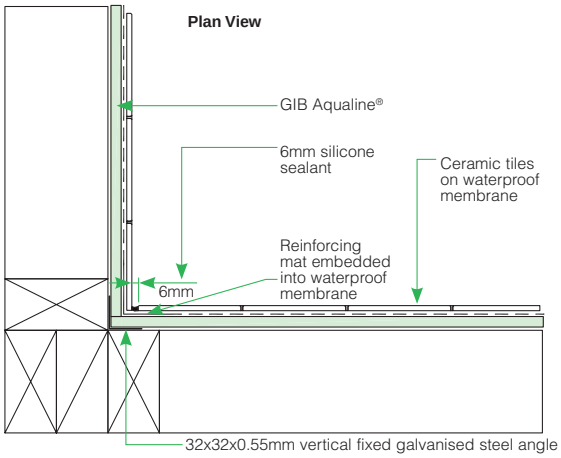
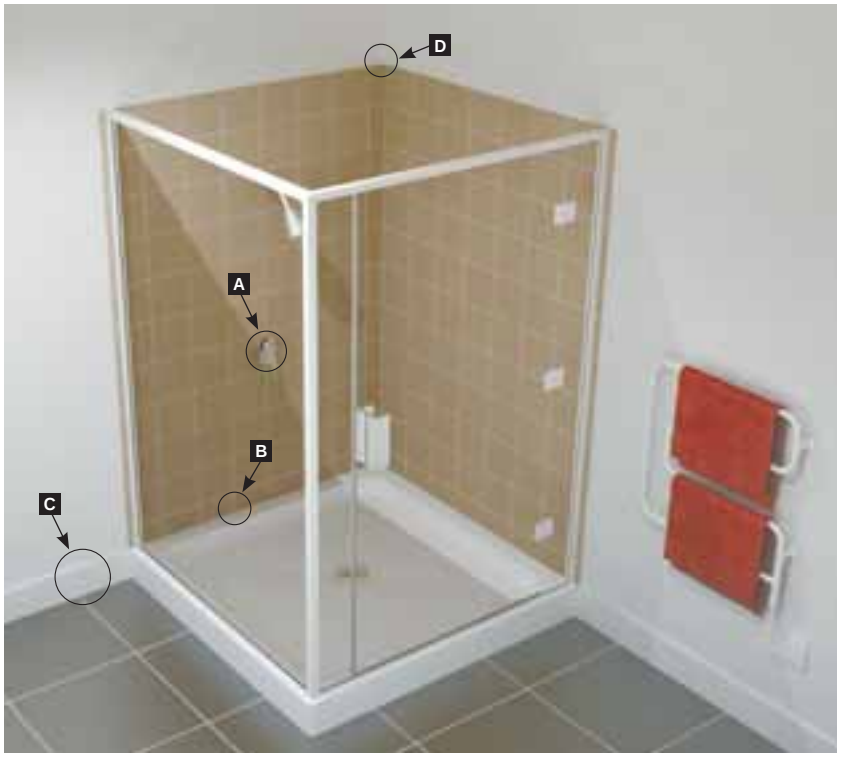


D GAW-D026



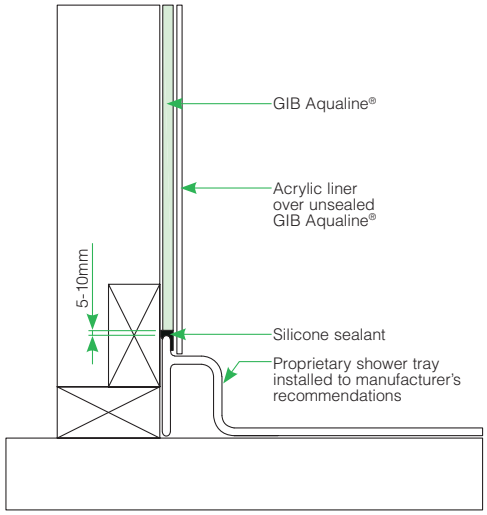


Shower – Acrylic Liner and Base

MARCH 2007

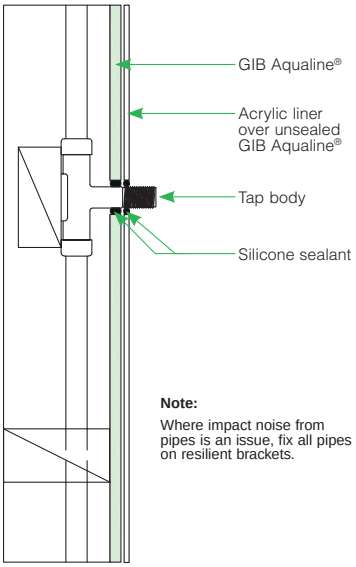
A

GAW-D027



B

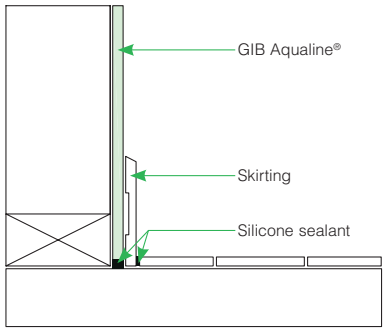
GAW-D028



Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

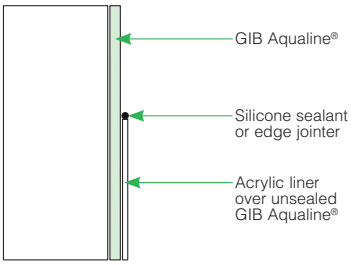
C

GAW-D029



D

GAW-D030

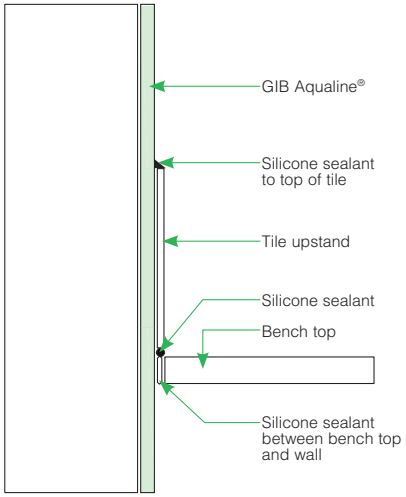


Kitchen and Laundry

MARCH 2007

A

GAW-D031



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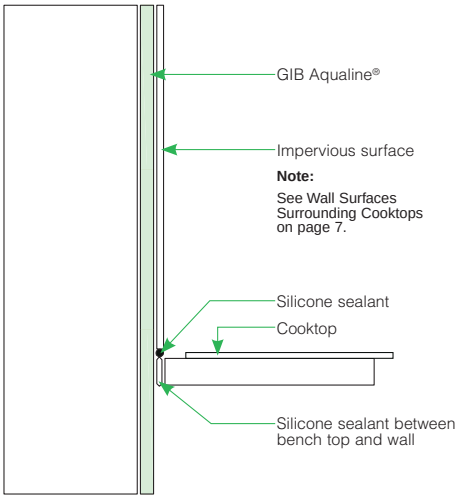
GAW-D032



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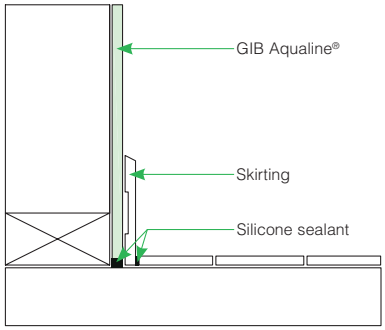
GAW-D033

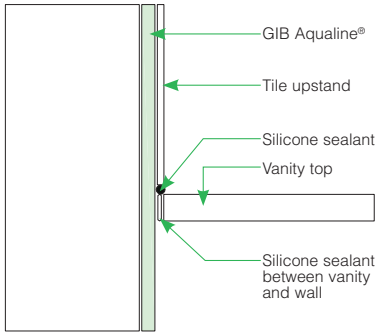


Office, Workplace or School Bathroom

MARCH 2007

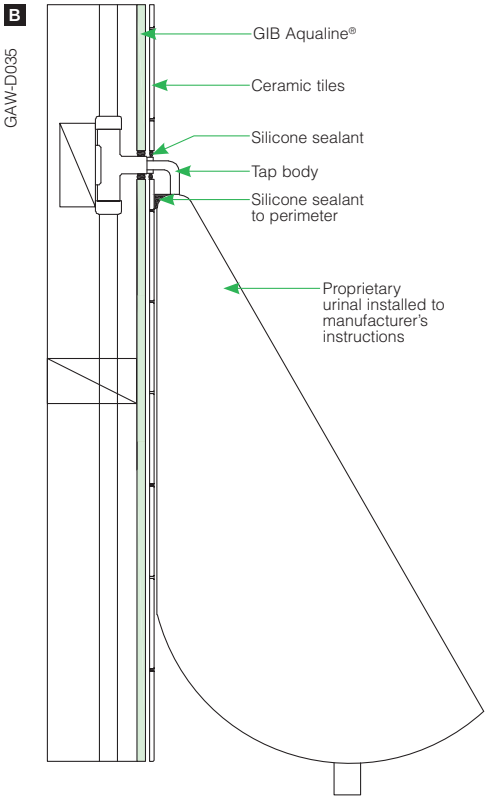
A

GAW-D034



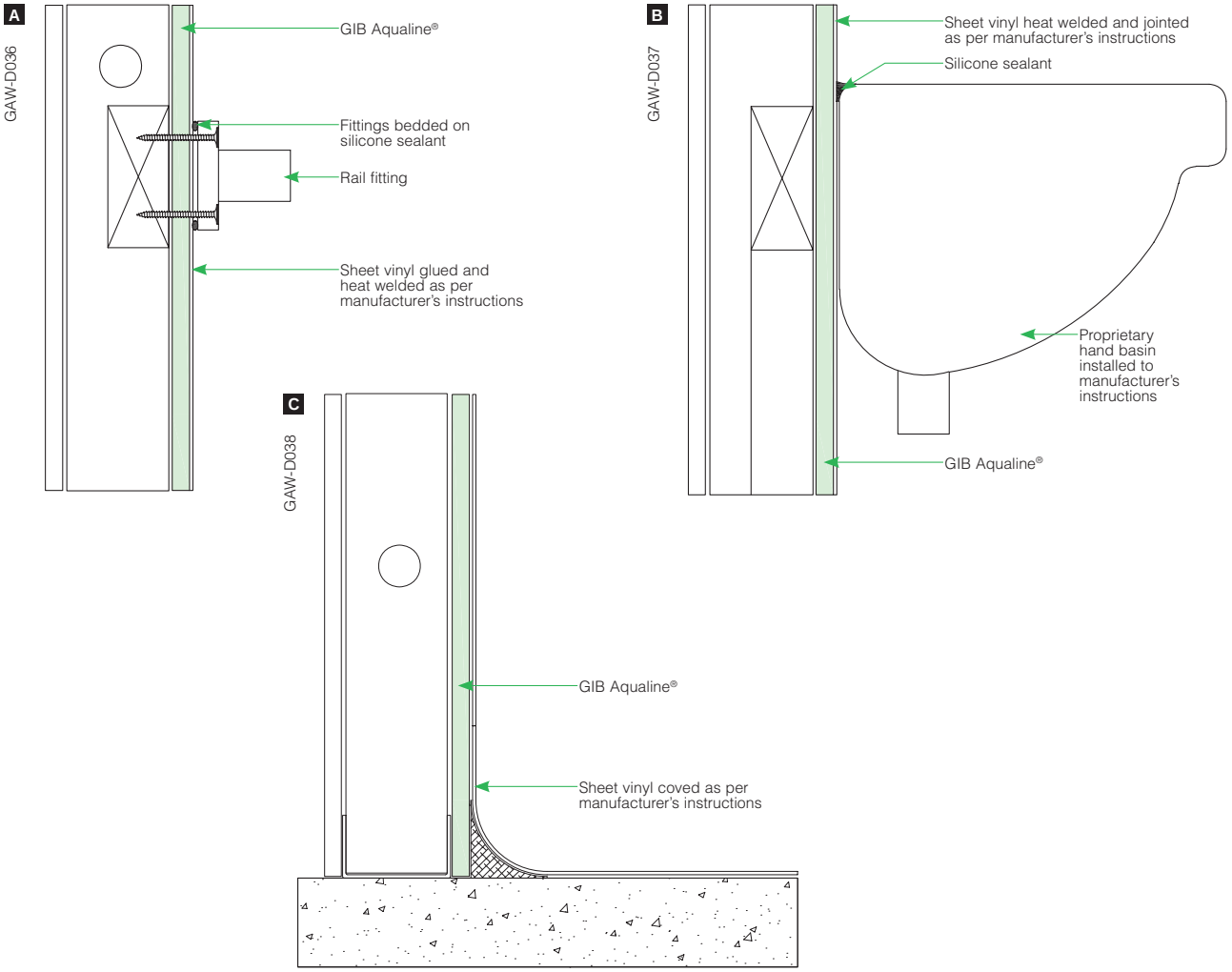
B

GAW-D035



Healthcare and Hospital Bathroom

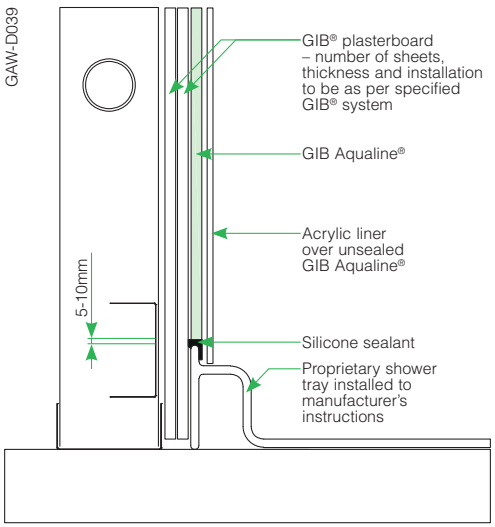
MARCH 2007



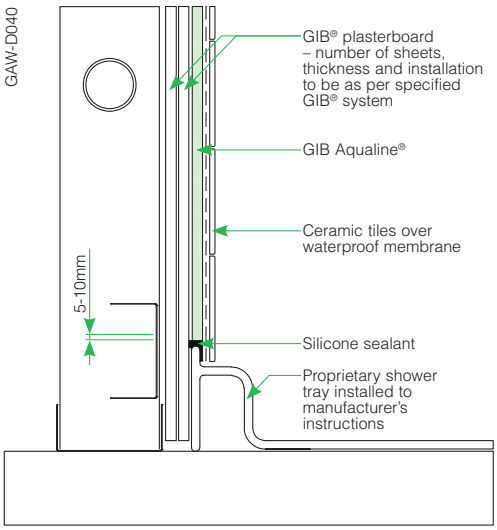
Fire Rated and Noise Control

MARCH 2007

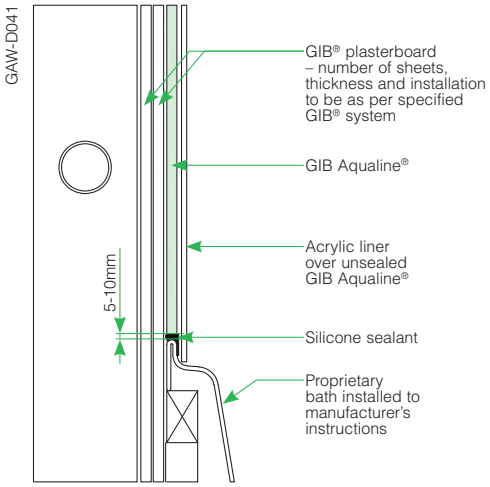
Shower – Acrylic Liner



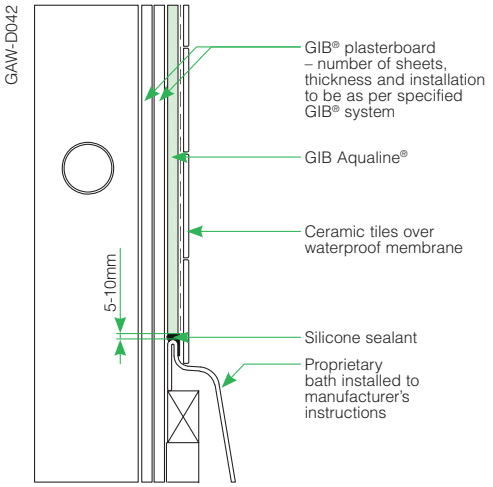
Shower – Tiled Walls



Shower Over Bath – Acrylic Liner



Shower Over Bath – Tiled Walls



GIB Aqualine® Fire Resistance and Noise Control Performance

When GIB Aqualine® is substituted into GIB® Fire Rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline on 0800 100 442.

Specification and Installation Checklist

MARCH 2007

Contract ID	
Site Address	
Client Name	
Designer	
Builder	
Plasterboard Installer	
Plasterboard Supplier	
Tiler	
Shower Installer	

DESIGNER	YES	NO	CHECKED BY	DATE
GIB Aqualine® specified for wet areas and appropriate details included on plans?				
Are tiled areas clearly shown on plans?				
Is area requiring waterproof membrane clearly shown on plan?				
Is the waterproof membrane required to be installed by a licensed applicator? If so, is this noted on the documentation?				
No bracing behind shower or bath?				
BUILDER	**YES**	**NO**	**CHECKED BY**	**DATE**
Galvanised steel angle installed to the internal corners of tiled shower?				
All sheet joints in showers to be made on solid timber. This may require some additional dwangs for horizontal board installation.				
PLASTERBOARD INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
10mm GIB Aqualine® for tiles up to 20kg per m^2?				
13mm GIB Aqualine® for tiles up to 32kg per m^2?				
GIB Aqualine® mechanically fastened at 100mm centres when tiles are to be installed?				
All junctions between GIB Aqualine® and walls, floors, baths, showers and other elements are correctly sealed with appropriate sealant?				
Pipe penetrations sealed?				
PLASTERBOARD STOPPER	**YES**	**NO**	**CHECKED BY**	**DATE**
Air drying compound (e.g. GIB ProMix® or GIB Plus 4®) not to be used on areas to be tiled.				
Recommended that GIB® AquaMix is used in wet areas.				
TILER	**YES**	**NO**	**CHECKED BY**	**DATE**
Waterproof membrane applied to shower areas prior to tiling?				
SHOWER INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
GIB Aqualine® walls must not be sealed or painted under where acrylic linings are to be installed.				
Ensure GIB Aqualine® is free from dust before installation of acrylic liners.				
Sealant applied to top edge of acrylic shower linings?				
BUILDER/PLUMBER	**YES**	**NO**	**CHECKED BY**	**DATE**
Sealant applied under penetration face covers?				

ROOFING

NEW ZEALAND STEEL

June 2010
(Replaces November 2005)

SPECIFIERS AND BUILDERS GUIDE

GALVSTEEL™ Axxis® STEEL FOR FRAMING COLORSTEEL® Zincalume®

CONTENTS

DESCRIPTION

New Zealand Steel produces a range of coated steel products.

COLORSTEEL® prepainted steel describes those steel building materials which have oven-cured paint applied to a galvanised or ZINCALUME® steel base on a continuous 'coil to coil' operation at the New Zealand Steel Glenbrook works.

The prepainting process gives excellent adhesion of the coating to the substrate, allowing rollforming to be performed after painting without delamination or deterioration of the paint film.

A variety of COLORSTEEL® prepainted steel coating types is offered. All COLORSTEEL® products are produced using either a ZINCALUME® steel substrate with an AZ150 or AZ200 coating class, (i.e.: 150 g/m^2 or 200 g/m^2 of zinc/aluminium alloy), or a galvanised steel substrate with a ZM275 coating class (i.e. 275 g/m^2 of zinc).

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

COLOUR FOR THE EXTREME

COLORSTEEL® MAXX™ products have a ZINCALUME® coated steel base. This product is intended for Very Severe environments.

COLOUR FOR THE FUTURE

COLORSTEEL® ENDURA™ prepainted steel has a ZINCALUME® coated steel base and is available in a range of colours, selected for their ability to provide optimum performance, durability and appeal.

ZINCALUME® zinc/aluminium alloy–coated steel has a 45% zinc, 55% aluminium alloy coating which offers superior corrosion resistance compared to galvanised steel in most environments (particularly coastal environments).

Traditional galvanised steel is offered under the trade name of GALVSTEEL™. This material has a 100% zinc coating and is available in a range of dimensions, grades, zinc coating weights and types.

STEEL FOR FRAMING

AXXIS® Steel for Framing is a brand of galvanised, high-tensile steel supplied for steel frames and trusses, used in residential and similar construction.

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

Where there is a requirement for a very durable product with high aesthetic appeal and low costs of installation and maintenance, then COLORSTEEL® prepainted steel products should be specified.

Each product is designed for application in a specific environment. These applications are discussed under the heading “The New Zealand Building Code” later in this publication.

QUALITY ACCREDITATION

The New Zealand Steel Limited Paint Line received accreditation to ISO 9002 in April 1992 and has subsequently been upgraded to ISO 9001 since July 1993. An on-going programme of continuous improvement will ensure that practice at New Zealand Steel Limited continues to reflect the best available international technology.

DESIGN FOR DURABILITY

Design has a major impact on the durability of the building. A good design will ensure that you will get the best possible life from your building and reduce maintenance costs.

The following design elements are presented alphabetically with guides to provide improved durability.

ANIMAL SHELTERS

Some agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. A corrosive ammonia environment can develop within sheds used for intensive animal farming.

ZINCALUME®, COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ should not be used for this application.

Design Guide:

1. Contact New Zealand Steel Limited for specialist advice.
2. ZINCALUME® STEEL OR COLORSTEEL® SHOULD NOT BE USED IN THIS ENVIRONMENT DUE TO EXTREME CORROSION RISK.

CORROSION

Dissimilar Metals Corrosion

When two different metals are in contact and moisture is present, one metal is relatively protected while the other suffers accelerated corrosion. This is known as galvanic or bi-metallic corrosion. A similar effect commonly occurs with water flowing over dissimilar metals.

This form of corrosion is commonly found:

1. Where water is discharged from copper or brass systems over a galvanised, or COLORSTEEL® prepainted steel or ZINCALUME® coated steel roof.
2. Where unpainted lead flashings are applied directly to ZINCALUME® coated steel products. (Refer Information Bulletin No. 2 “Flashing Materials”).
3. Where fasteners are incompatible with the roofing material. (See Fixings and Fasteners, page 5).

Design Guide:

1. Separate dissimilar metals by using a barrier such as PVC tape, neutral cure silicone sealant or an appropriate paint system.
2. Prevent potential run-off from copper or brass pipes over GALVSTEEL™, ZINCALUME® coated steel or COLORSTEEL® prepainted steel surfaces by diverting the discharge clear of the roofing. Copper pipes must be isolated from AXXIS® Steel for Framing.

Note: Coastal areas with high salt levels and high humidity will increase the possibility of dissimilar metals corrosion.

Compatibility

More Active Metals

ZINC
ZINCALUME®
ALUMINIUM

STEEL

LEAD

COPPER

STAINLESS STEEL

More Noble Metals

This chart lists commonly used metals in a “Galvanic Series”. If any of these metals are in damp contact or a run–off situation, the metal higher on the table will sacrifice itself to protect the metal lower on the scale. Therefore the simple rule is to remember that you can run water down but not uphill. For example, zinc to copper is alright but copper to zinc is not.

RUN-OFF FROM INERT MATERIALS

The zinc coating on galvanised steel products develops a protective surface film as a result of natural weathering. This provides the longevity of performance which we have come to expect from GALVSTEEL™ products.

When flowing over galvanised roofing, rainwater dissolves small amounts of minerals and salts from the zinc surface. These minerals and salts promote and maintain the protective film and enhance the corrosion resistance of downstream galvanised steel products (eg: lean-to roofs, gutters and valleys).

However when rainwater flows over, or is collected from roofing materials which do not promote this protective film (INERT MATERIALS), accelerated corrosion of unpainted galvanised steel roofs and gutters can occur.

Some Examples of Inert Materials:

• ZINCALUME® steel • Glass • Fibreglass • COLORSTEEL® prepainted steel • Glazed Tiles • PVC • Acrylic • Aluminium

Design Guide:

1. On galvanised roofing, run skylights down to the gutter.
2. To achieve maximum life from your rainwater goods we recommend that they are manufactured from either ZINCALUME® steel or COLORSTEEL® prepainted steel products.
3. Unpainted galvanised steel must not be used for roofing or rainwater goods, including valleys and gutters, to collect water run-off from ZINCALUME® coated steel products or any other inert material.

DRINKING WATER

Rainwater collected from roofs clad with products made from GALVSTEEL™, ZINCALUME® coated steel and COLORSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources.

The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts.

Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

EDGE SEALING OF COLORSTEEL® PRODUCTS

Edge sealing of COLORSTEEL® products is not recommended. (See Environmental Categories and Product Recommendations section).

EXPANSION ALLOWANCE AND TEMPERATURE

All roofing and cladding is subject to expansion and contraction due to temperature extremes. This is particularly evident with darker colours and long spans where the expansion may be as much as 8.0mm for a 10.0 metre sheet. Fixing systems must allow for expansion and accommodate the longitudinal movement which results.

Design Guide:

Typical Roof Temperatures Summer Average - Calm Conditions

	INSULATED	UNINSULATED
Light Colours (eg Titania)*	58˚C	48˚C
Medium Colours (eg Mist Green)	79˚C	67˚C
Dark Colours (eg Karaka)	92˚C	77˚C

**Light Colours include unpainted galvanised and ZINCALUME® steel material.*

Typical Roof Expansions

Based on 0.01mm/m/˚C

	8 METRE RUN	12 METRE RUN	18 METRE RUN
Light Colours*	5mm	7mm	11mm
Medium Colours	6mm	10mm	14mm
Dark Colours	7mm	11mm	17mm

FIXINGS AND FASTENERS

The selection of the appropriate form of fastener is a task which should not be solely influenced by cost. Fastener costs are minimal relative to the overall project and there is no benefit to be gained through the use of inferior fixings. The fastener durability should equal or exceed that of the roofing or cladding product.

The “Metal Roofing and Wall Cladding Code of Practice” provides some information on selection, fixing methods and placement of fasteners. This handbook is available on request from members of the New Zealand Metal Roofing Manufacturers Incorporated or New Zealand Steel Limited. More detailed information can also be obtained from fastener manufacturers.

Design Guide:

1. Fastener performance should conform with the requirements of AS3566 (and Amendments) “Screws – Self Drilling for the Building and Construction Industries”.
2. Stainless steel and stainless steel capped fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments due to incompatibility.
3. Low carbon, non conducting sealing washers are required for use with COLORSTEEL® prepainted steel products and ZINCALUME® coated steel products.

   The advice of specialist fastener manufacturers is readily available and these manufacturers should be consulted, particularly where COLORSTEEL® prepainted steel products are to be fixed in Very Severe or Severe Environments. (see Environmental Categories and Product Recommendations, page 15).
4. Fasteners with heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566 Class 3 and 4 are fully compatible with all products.
5. Fasteners used on COLORSTEEL® prepainted steel products should be factory coated to provide an accurate colour match with COLORSTEEL® prepainted finishes.
6. ***Rivets:***

- Use aluminium rivets for joining all New Zealand Steel Limited roofing products. (Ensure rivet is of a suitable strength for the purpose. Refer to your rivet supplier).
- Monel rivets are not recommended as they are incompatible due to their copper content.

Fastener Recommendations

Environmental Category*	ISO	GALVSTEEL™	ZINCALUME®	COLORSTEEL® ENDURA™	COLORSTEEL® MAXX™
Coastal:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Industrial:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Inland:					
Moderate	C2	3	3	3	3,4

NR: New Zealand Steel product not recommended for exterior applications for these Environmental Categories.

4: Heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566.2–2002 Class 4.

3: Heavy zinc or zinc-tin coatings complying with AS3566.2–2002 Class 3.

* See page 16 for definitions of Environmental Categories.

Note:

1. Stainless steel fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments.
2. Sealing washers that contain carbon black filler levels of more than 15% by volume may lead to corrosion of ZINCALUME® steel and COLORSTEEL® prepainted steel products. Therefore, all fasteners for New Zealand Steel roofing products should have low carbon, non-conducting sealing washers.
3. Refer to Information Bulletin 10.

FLUES – DOMESTIC/INDUSTRIAL

Natural gas, wood, coal or oil-fired heaters generate high levels of sulphur compounds. When vented over a roof, particularly in damp conditions, sulphuric acid forms which will lead to premature corrosion of the roof, guttering and downpipes.

Design Guide:

1. Design the height of the flue to allow combustion by-products to be dissipated.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments.
3. Ensure that heaters are run as efficiently as possible to allow complete combustion.
4. Regularly wash the roof to remove contaminants.

FOOT TRAFFIC ON ROOFS

Repeated foot traffic and the dragging of maintenance or cleaning equipment, may damage the roof which will reduce its life expectancy.

Design Guide:

1. Design and install catwalks and platforms over the roof where necessary.
2. Aluminium or galvanised steel catwalks are recommended.
3. Design catwalks and platforms so as not to create an unwashed or ponding area on the roof.
4. Timber catwalks and platforms will cause preferential corrosion of underlying roof.

FUME EXTRACTORS AND VENTS

Corrosive dust and particles can be released through roof vents and discharged onto the roof surface. The immediate area of the roof adjacent to the vent is then at increased risk of corrosion.

Design Guide:

1. Install filter elements to contain hazardous material.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments to be installed adjacent to the vent.
3. Consider applying a suitable protective coating to the affected area of the roof.
4. Maintain coal or oil fired boilers or incinerators so that they do not discharge high sulphur levels over the roof surface.
5. Regularly wash the roof to remove contaminants.

GEOTHERMAL AREAS

In areas of geothermal activity, hydrogen sulphides associated with bore emissions can cause corrosion problems. Although heavier than air, hydrogen sulphide can be drawn into rainwater down-pipes and accumulate in gutters. This can lead to corrosion of the gutters and the roof overhangs.

Design Guide:

1. Install a water trap at the base of down-pipes.
2. Specify the appropriate COLORSTEEL® prepainted steel product.
3. Contact New Zealand Steel Limited for specialist advice.

MIXING OF BRANDS

Where different brands of prepainted material are used on the same building, differences in colour, gloss and weathering performance may appear obvious within a short period of time. This will be due to the different paint formulations used by different manufacturers.

New Zealand Steel Limited will not accept liability for problems caused by the mixing of brands.

Design Guide:

1. Specify either COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ products.

OVERPAINTING OF COLORSTEEL® PREPAINTED STEEL PRODUCTS

COLORSTEEL® prepainted steel products are designed for durability. However, all paint coatings will deteriorate over time. Therefore, at some stage, it will be necessary to repaint to avoid serious deterioration of the product.

The main consideration is the paint coating integrity to perform a suitable bond for the overpainted system so that the durability of the new coating system is maintained.

New Zealand Steel's experience would indicate that this period to first repaint is around 15 years. However, local climatic conditions, building design and paint colour can have a significant influence on the performance of the paint system. Therefore you may need to consult New Zealand Steel or our paint suppliers, PPG Industries NZ Ltd, to help assess the most suitable time to repaint.

COLORSTEEL® prepainted steel products may be readily overpainted, after suitable preparation, for aesthetic reasons. Detailed information is available in the New Zealand Steel Limited Information Brochure: Overpainting New and Weathered Steel Roofing.

PROCESSING PLANTS

(Including Swimming Pools)

Some commercial applications may create internal environments in which the build-up of pollutants or fumes are a potential source of corrosion. Plants where chlorine vapours are released (including enclosed swimming pools) should have adequate ventilation to minimise the risks.

Design Guide:

1. Where pollutants or humidity levels are likely to be high, allow for frequent air changes.
2. Passive ventilation may be inadequate to cope with the problem and the installation of fan systems should be considered and incorporated at the design stage.
3. Contact New Zealand Steel Limited for specialist advice.

PROFILE BEND DIAMETERS – ROOFING, WALL CLADDING AND ACCESSORIES

New Zealand Steel Limited products are custom designed to ensure maximum compatibility with the roll-forming process. The paint systems are designed to be durable and adhere to the metal substrate so that they are not affected by good roll-forming practices. However, tight tension bends in the finished product should be avoided as small cracks may be formed which expose the metal substrate to the atmosphere.

For optimum corrosion performance no visible microcracking should be present in the finished product. There are many factors, substrate, paint, bend diameter and forming practice, that affect the tendency to microcrack. Therefore, it is not practical to have a fixed bend diameter that guarantees no microcracking.

Most products, formed in well designed and operated equipment, will not have microcracks at tension bends. It is important that visual checks for microcracking be made on the finished product to ensure a high quality standard is maintained.

Products with microcracking on the tension bends will show earlier signs of corrosion when used in unwashed areas in severe environments.

Design Guide:

1. The use of corrugated profiles in severe and 'special conditions' (e.g. Geothermal) will help to ensure greater durability.

SOLAR HEATING PANELS OR RUBBER MATS

During the installation of solar heating systems, care should be taken to prevent any damage to the roofing material. Because of the high temperatures created and the increased condensation which may result, care should be taken to maintain an air space between the roof and the heating unit. Follow manufacturers' recommendations concerning tube direction and the use of fixing support brackets.

Failure to do this may invalidate a COLORSTEEL® prepainted steel product warranty.

Design Guide:

1. Never place heating elements or plumbing units directly on the roof surface. Follow the system supplier's recommendations concerning installation.

SWARF STAINING OF ROOFING AND CLADDING

Swarf is the term given to steel debris arising from cutting or piercing operations when using friction saws, abrasive discs, drills etc., on steel roofing and cladding products. Whilst comprising mostly fine steel particles mixed with abrasive, in this context swarf may also be taken to include any other discarded steel objects such as rivet shanks, nails, screws and nuts, which may come into contact with coated products; ie: COLORSTEEL® prepainted steel, ZINCALUME® zinc/aluminium alloy-coated steel and galvanised steel.

Swarf particles, if left on the surface, will corrode and cause rust stains which will detract from the finished appearance of a project. These stains are often mistaken for early deterioration of the roofing and cladding itself.

Design Guide:

1. Never leave swarf material on the coated surface. Follow the recommendations included in the New Zealand Steel Limited Installers Guide or Information Bulletin 7.

UNWASHED AREAS

When contaminants such as windblown salt and dust accumulate on painted surfaces and become damp, corrosion will take place. Many windblown contaminants absorb moisture when exposed to high humidity and their presence on steel accelerates corrosion.

For this reason, areas on a building which are seldom washed by rain are particularly prone to early breakdown of the material.

This effect may first be noticed as a white corrosion product, typically seen on the underside of gutters, canopies, roof vents or on sheltered areas and the underside of profiles used horizontally as wall cladding. It will be more noticeable where tighter radius bends have been used in roll forming.

Even on coated steel where corrosion reactions are much slower, the presence of contaminants over long periods of time will increase the rate of corrosion.

The maintenance regimes for unwashed areas, necessary to meet the durability requirements of the Building Code, are shown on pages 17 and 18 of this publication.

When the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel products is exposed in an unwashed area, e.g.: canopies, verandas, eaves, lean to buildings etc., additional maintenance, above that specified on pages 17 and 18, is required to ensure satisfactory performance of the product.

Design Guide:

1. Every effort must be made during the design of the building to eliminate or minimise sheltered or overhanging areas.
2. Consideration should be given during the design stage to ensure the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel is enclosed and therefore not exposed to the environment.
3. Where unwashed areas cannot be designed out, specify regular washing of these areas as part of an ongoing maintenance programme. Refer to pages 17 and 18 for New Zealand Steel Limited recommendations.
4. Design consideration for easy access must be given to areas that require regular maintenance.
5. Ensure profile bends are not tighter than those recommended under the heading of “Profile Bend Diameters – Roofing, Wall Cladding and Accessories”, and that there are no microcracks in the finished product.

WATER PONDING

Roofs

Where the roof pitch is low, changes in roof loadings may result in a negative pitch and consequently lead to water ponding. Water ponding is detrimental to the performance of COLORSTEEL® prepainted steel products. The following conditions commonly cause water ponding:

- Over-spaced purlins.
- Deformation of timber purlins.
- Placement of external loads such as air conditioning units.
- Rigid fixing on long spans which causes deformation of the profile as a result of thermal expansion.

Design Guide:

1. Never use a pitch of less than 3 degrees or the minimum recommended for the profile, whichever is greater. Pitches of less than this invalidate the warranty.
2. Design the roof according to the profile manufacturer's specifications.
3. On minimum pitch roofs, ensure that the gutter end of profiled sheets is turned down.
4. Allow for thermal expansion to prevent profile distortion.
5. Consider the use of walkways to prevent damage where the roof may be subject to heavy foot traffic.
6. Ensure roof penetrations do not block the flow of water from the roof.

Note: Please refer to "New Zealand Steel Limited Products and the New Zealand Building Code" on page 13 of this publication under "E2/AS1 External Moisture"

Gutters

Gutters must be installed with adequate fall to ensure all water is transported to appropriately located downpipes. Ponding occurs when water remains in the gutter when the fall is inadequate. Over time, this causes degradation to the coating and ultimately leads to gutter perforation. Perforation of the gutter as a consequence of inadequate fall or ponding invalidates both the manufacturer and producer warranties. The installation and downpipe construction should allow the gutter to drain completely.

Regular gutter cleaning and maintenance is required to remove leaves and other debris that may restrict water flow to downpipes. Particular care should be taken at the entrance to downpipes and corners, to avoid blockages leading to water ponding.

A gutter protection system (or any other product) that entraps water between itself and any steel product surfaces, restricting the coated steel's ability to dry, is not recommended and is an exclusion in the product warranty.

WEATHERING OF COLORSTEEL® PRODUCTS

All building products will weather over time. The weathering of COLORSTEEL® prepainted steel products will result in changes to gloss and colour. Factors which influence the change are environmental pollution, UV levels, building orientation and paint colour.

Design Guide:

1. When adding to an existing building, consideration should be given to the weathered appearance of the COLORSTEEL® prepainted steel products in the older part of the building.

NEW ZEALAND STEEL LIMITED PRODUCTS AND THE NEW ZEALAND BUILDING CODE

The New Zealand Building Code defines durability requirements for many elements of buildings. These requirements are outlined in section B2 Durability. In general, most roofing and cladding is required to last a minimum of 15 years (or a nominated period), to water penetration, but in some cases where the material has a structural function, the requirement may be for 50 years. This can be achieved with suitable maintenance.

The New Zealand Building Code calls for durability performance which is relative to both maintenance and to working environments. The following information will assist specifiers to relate these variables to New Zealand Steel Limited products.

CONFORMING WITH THE BUILDING CODE

ZINCALUME® steel and the substrate used to produce COLORSTEEL® prepainted steel products, have met the requirements of AS1397:2001 and are manufactured under a quality management system to monitor ongoing compliance with this Standard. ZINCALUME® steel has been appraised by BRANZ as being suitable as feed stock for the manufacture of roof and wall cladding systems, cladding accessories, spouting, downpipes and other rainwater goods.

EXTERNAL MOISTURE E2/AS1

Adequate Pitch

The New Zealand Building Code provides an Acceptable Solution to the problem of roof pitch. The pitch figures shown in paragraph 8·4·5 of Acceptable Solution E2/AS1 are reproduced, in part, below for your convenience.

Refer specific enquiries to the Profile Manufacturer who may have an Alternative Solution.

ROOF PITCH REQUIREMENTS

Product	**Minimum Pitch**	
For profiled metal roof cladding	Sheet Length ≤18m	> 18m
Corrugated (with end laps present)	≥ 10°	Refer manufacturer
Corrugated (no end laps present)	≥ 8°	Refer manufacturer
Trapezoidal (where the crest height is less than 27mm)	≥ 4°	Refer manufacturer
Trapezoidal (where the crest height is 27mm or higher)	≥ 3°	Refer manufacturer
Trough profile	≥ 3°	Refer manufacturer

Source: New Zealand Building Code: Acceptable Solution E2/AS1

Note: Where manufacturers have more stringent requirements, these should be followed to optimise performance and to avoid invalidating guarantees.

OUTBREAK OF FIRE

ZINCALUME® steel and COLORSTEEL® prepainted steel need not be separated from flues and chimneys. However, when formed into cladding products and associated accessories that are used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

CONTROL OF EXTERNAL FIRE SPREAD

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into roof cladding profiles are suitable for use as an external roof cladding in all purpose groups in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·1.

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into wall cladding profiles are suitable for use as an external wall cladding on all buildings in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·2a. This statement is conditional on any applied surface finish being no more than 1mm in thickness.

Specifiers should be familiar with the Acceptable Solution C/AS1 Part 7: Control of External Fire Spread, which covers vertical and horizontal spread of fire.

MAINTENANCE

All roofing and cladding products are subject to the cumulative effects of weather, dust and other deposits. Normal rain washing will remove most accumulated atmospheric contaminants from roofs. For wall cladding, manual washing every 3 to 12 months, depending on the paint system, is recommended in moderate to very severe environments to prevent accumulation of dirt, debris or other material not removed by rain washing. For areas that do not receive any or adequate rain washing (called unwashed areas) such as soffits, wall cladding under eaves, underside of gutters, fascias, sheltered areas of garage doors and unwashed roof areas, more extensive manual washing is required. Similarly, other High Risk areas, around flues, under television aerials or overhanging trees and sites prone to mould, lichen, bird droppings or debris, need to have regular manual washing.

Regular washing of COLORSTEEL® prepainted steel products increases the durability by reducing attack from airborne salts and pollutants. GALVSTEEL™ products and ZINCALUME® steel products will also benefit from routine washing.

COLORSTEEL® prepainted steel surfaces should be manually washed with water and a sponge or a soft nylon-bristled brush. For large areas it may be more appropriate to use water blasting at pressures up to 20MPa.

Overpainting of COLORSTEEL® prepainted steel products is discussed on Page 8 of this publication.

If New Zealand Steel Limited products are maintained according to the following recommendations, the requirements of the New Zealand Building Code B2 for 15 year durability for roofs and exterior walls will be met or exceeded.

Note:

1. The New Zealand Building Code durability requirement does not include aesthetic appearance.
2. The New Zealand Building Code requires a durability of 15 years minimum (with maintenance) for roofing, including valleys, and wall cladding products. This means no moisture penetration due to product failure.
3. The New Zealand Building Code requires a durability of 5 years minimum (with maintenance) for rainwater products, gutters and downpipes. This means no perforation due to product failure.
4. New Zealand Steel Limited products are designed to exceed the New Zealand Building Code B2: durability requirements. Continued maintenance and overpainting will greatly extend the ultimate life of all products.
5. Where a 50 year durability is required **OR** where a product is to be used in aggressive internal environments, New Zealand Steel Limited should be consulted.
6. In Industrial Environments, the type of pollution generated may alter the above recommendations. If in doubt, consult New Zealand Steel Limited.

The following maintenance information in the Environmental Chart is for guidance only.
Each proprietary building product should carry its own manufacturers' recommendations for usage.

New Zealand Steel Limited will not accept responsibility for proprietary roofing and cladding products which do not conform to our recommendations for manufacturing, environmental use or maintenance.

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

Important: As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.

The following four pages present a guide to New Zealand's environmental categories, the products recommended for specific conditions and residential roofing warranties.

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

INTRODUCTION

New Zealand has a wide range of environmental conditions, from the harsh West Coast beaches, to the relative shelter of the Waikato farming region. Therefore, New Zealand Steel Limited offers a range of steel products which are suitable for most locations.

VERY SEVERE – ISO CATEGORY 5

50m from high water on East Coast, 100m from high water on West Coast.

Characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf (typically 50-100 metres) such as is found on exposed coasts.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

SEVERE – ISO CATEGORY 4

Characterised by:

- Light salt deposits.
- A frequent smell of salt in the air.
- Typically starts 100-500 metres from breaking surf such as is found on exposed coasts.
- In the immediate vicinity of large expanses of calm salt water such as harbour foreshores.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

MODERATE COASTAL – ISO CATEGORY 3

Characterised by:

- Little or no salt deposits.
- The occasional smell of salt in the air.
- Typically starts 500-1000 metres from breaking surf such as is found on exposed coasts, OR in the immediate vicinity of calm salt water such as estuaries.

MODERATE INLAND – ISO CATEGORY 2

Characterised by:

- No obvious marine or industrial influences.
- Typically more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

COMMERCIAL WARRANTY

Such as schools, warehouses and buildings, refer to New Zealand Steel Limited for details of commercial warranties. Maximum warranty offered on commercial buildings is 15 years.

IMPORTANT

- As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.
- Gutters should be installed according to manufacturer's instructions.
- Unwashed and high risk areas – manual washing every 3 months.

0 metres **50 metres**

COLORSTEEL® Maxx™
COLOUR FOR THE EXTREME

Greater than 50m from breaking surf on the East Coast.
Greater than 100m from breaking surf on the West Coast.

WARRANTIES	MAINTENANCE
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 3 months.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every month.
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every month.
15 years: covering the paint surface against flaking, peeling and excessive fade. **20 years:** against perforation as a result of corrosion.	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.
15 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.

COLORSTEEL® Endura™
COLOUR FOR THE FUTURE

WARRANTIES	MAINTENANCE
Not recommended	Not recommended
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing
Not recommended	• Rain washing plus manual washing every 6 months.
5 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.
5 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.
18 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.

Zincalume®

WARRANTIES	MAINTENANCE
Not recommended	Not recommended
Not recommended	Not recommended
15 years: against perforation as a result of corrosion.	• Rain washing
15 years: against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.
10 years: against perforation as a result of corrosion.	• Manual washing every 3 months.
10 years: against perforation as a result of corrosion.	• Manual washing every 3 months.

GALVSTEEL™

WARRANTIES	MAINTENANCE
Not recommended	Not recommended
Not recommended	Not recommended
No warranty applies	• Rain washing
	• Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location.
	• Manual washing every 3 months. Painting may be advisable depending on the specific location.
	• Manual washing every 3 months. Painting may be advisable depending on the specific location.

VERY SEVERE COASTAL — **100 metres** — **SEVERE COASTAL** — **500 metres** — **MODERATE COASTAL** — **1000 metres** — **MODERATE INLAND**

COLORSTEEL® Maxx™ COLOUR FOR THE EXTREME | COLORSTEEL® Endura™ COLOUR FOR THE FUTURE | Zincalume® | GALVSTEEL™

SPECIAL ENVIRONMENTS

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas. They include:

1. **Geothermal Areas**
   Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define. Please consult New Zealand Steel Limited for further details.

2. **West Coast, South Island**
   In this area, smoke from the coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® prepainted steel coating. The effects of a severe coastal environment aggravate the situation.

   This area combines the most severe features of both industrial and coastal environments. Please contact your local supplier for the best COLORSTEEL® prepainted steel product to use.

3. **Internal Environments**
   Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds used for intensive animal farming. Please consult New Zealand Steel Limited for further details.

4. **Industrial Environments**
   Close to corrosive industrial emissions and subject to heavy fallout from them. Please consult New Zealand Steel Limited for further details.

Further Assistance
Further advice on the selection of the appropriate product to suit your particular location can be obtained from New Zealand Steel Limited or your local COLORSTEEL® prepainted steel supplier.

VERY SEVERE SPECIAL ENVIRONMENTS

COMMERCIAL WARRANTIES

Commercial warranties are issued through the Rollformer by New Zealand Steel Limited and the terms are specific to each contract.

In order to ensure the appropriate product is specified for the intended service life in any given environment, New Zealand Steel Limited is keen to be consulted as early as possible in the design stage to ensure correct material selection and backing by an appropriate warranty.

Warranty applications are generally made through the roofing manufacturer and warranty periods and conditions are assessed by New Zealand Steel Limited.

Factors such as roof design, roof pitch, profile, coating type, internal and external environments and special conditions (such as requirement for “Clean in Place”) are all assessed at the time of the warranty application. Maintenance requirements will be specified as part of the warranty.

Draft warranties are available from New Zealand Steel Limited to support tenders for specific projects. The terms and conditions of the draft will remain unchanged providing that the terms of the project are unaltered.

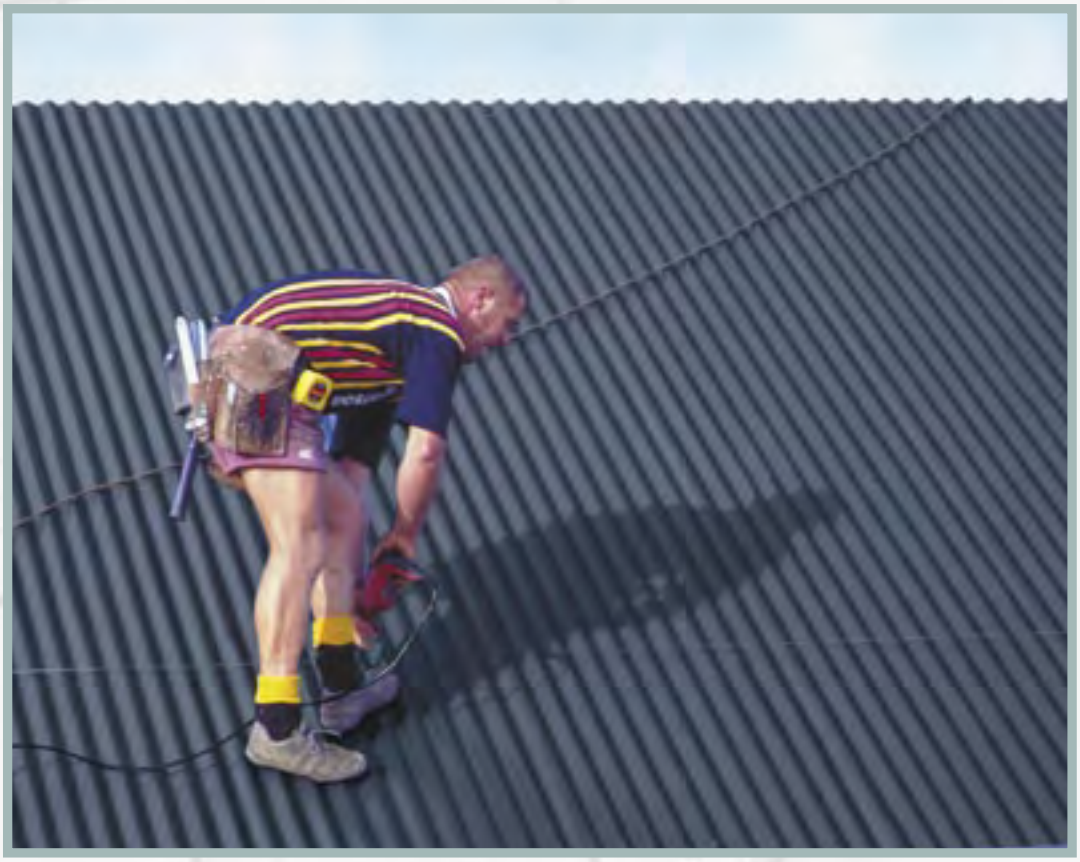
A warranty is issued on the satisfactory completion of the contract. Installation must be carried out in accordance with New Zealand Steel Limited’s requirements and according to good trade practices as detailed in the “Metal Roofing and Wall Cladding Code of Practice”.

A site inspection by New Zealand Steel Limited may be carried out prior to the issuing of any warranty.

The maintenance programme specified in the warranty must be complied with to validate the warranty.

INSTALLATION INFORMATION

Details relating to the installation of all products are provided in the “Installers Guide”. This booklet covers New Zealand Steel Limited’s recommendations for handling, cutting, fixing, sealing, site storage, etc. Additional copies of this publication may be obtained from New Zealand Steel Limited.



INFORMATION TO HELP YOU AVOID PROBLEMS

In almost all applications, ZINCALUME® coated steel and COLORSTEEL® prepainted steel will out-perform galvanised steel. There are however, a small number of applications for which galvanised steel is more suitable.

ZINCALUME® coated steel and COLORSTEEL® prepainted steel products must not be used for:

- Formwork in contact with wet concrete.
- Products to be embedded in concrete. However, where very small volumes of concrete are involved (e.g. splashes) which are able to cure quickly, there is little corrosive effect.
- Fertiliser storage sheds and containers.
- Culverts, or where ZINCALUME® coated steel material is buried in the ground.
- Water tanks.
- Highly alkaline environments (e.g. cement manufacture).
- Coolroom products.
- Buildings for intensive animal farming.

TECHNICAL FEATURES

CORROSION PROTECTION

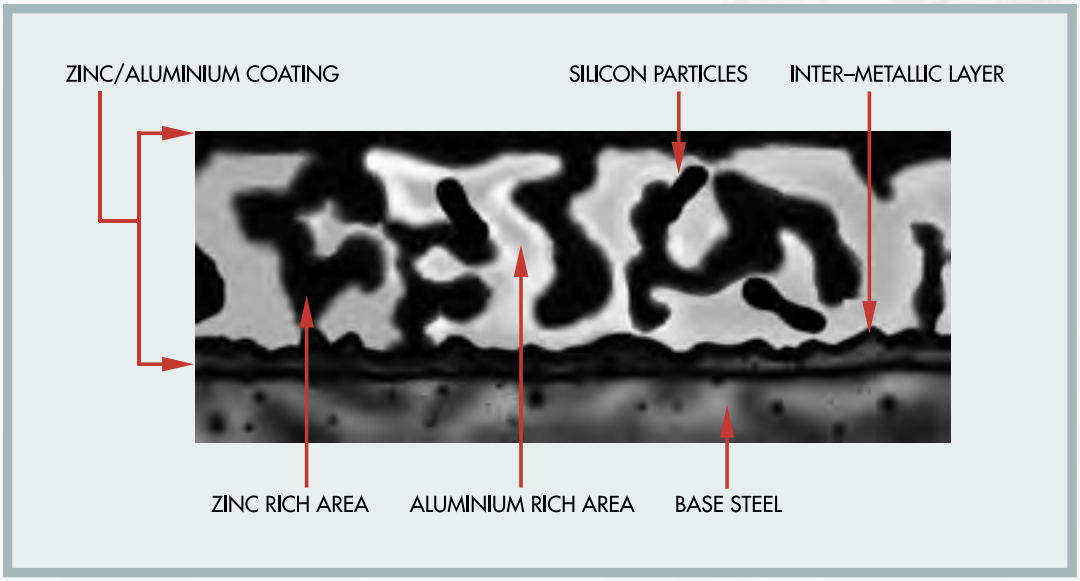
The long established method of protecting steel against corrosion has been to apply a coating of zinc (galvanising). The zinc surface forms a hard, impervious layer which limits further corrosion. This provides for the longevity of performance which we have come to expect from galvanised steel products.

The zinc coating also possesses another very useful property. Small exposed surfaces of the underlying steel such as scratches or cut edges do not corrode because of an effect known as sacrificial protection.

ZINCALUME® steel, a zinc/aluminium alloy coating, provides a superior performance to that of galvanised steel. It combines the barrier protection of aluminium and the sacrificial protection of zinc, thus giving the best of both worlds.

It follows that by coating these substrates with an added paint system, the steel core will be protected for a longer period. It is for this reason that the COLORSTEEL® prepainted steel coating systems were developed. Each coating is designed to protect the substrate from specific environmental conditions.

Cross Section of ZINCALUME® Coated Steel



UV PROTECTION

New Zealand experiences some of the most extreme UV conditions in the world. UV light can cause breakdown of the resin used in some paints. This leads to erosion and chalking of the paint film. UV light can also cause the breakdown of pigments (particularly organic based pigments) resulting in fading.

In response to this threat, an on-going programme of product improvement has led to the formulation of the current COLORSTEEL® prepainted steel paint systems. These systems utilise pigments and resins which have been selected for their colour stability, flexibility and durability.

PROFILE DESIGN INFORMATION

Specifications relating to roofing and cladding profiles and pricing details should be sought from the specialist roofing manufacturers concerned. **New Zealand Steel Limited does not provide a rollforming service.**

Profile designs from your local supplier will specify the grade and BMT appropriate to any contract.

Definitions

1. BMT: Base metal thickness is the thickness of the uncoated steel core. The finished thickness of the material will increase by the accumulation of coatings during manufacture by New Zealand Steel Limited.
2. Grade: The mechanical strength of the steel substrate is expressed in yield strength values measured in MPa. Low strength steel may be rated as G1, G250 or G300. As the yield strength of the material increases, so do the values, so that G550 has the highest strength.
3. Span: The distance between purlins, as recommended by the Rollformer for each particular profile.

ZINCALUME®

Steel Cladding.

HOW TO SPECIFY NEW ZEALAND STEEL LIMITED ROOFING AND CLADDING PRODUCTS

- Product (ZINCALUME®, GALVSTEEL™, COLORSTEEL® ENDURA™, COLORSTEEL® MAXX™)
- Profile
- Colour (Where applicable)
- BMT (eg: 0.40 or 0.55mm)
- Grade (eg: G300 or G550)

FURTHER COATING/SURFACE OPTIONS

In addition to the products making up the standard COLORSTEEL® prepainted steel product range, New Zealand Steel Limited produce non-standard coatings for special applications (eg: high reflectance finishes). For specialised options please contact New Zealand Steel Limited.

FURTHER INFORMATION

For additional information, literature or technical assistance, please contact:

COLORSTEEL® and ZINCALUME® Marketing
New Zealand Steel Limited
Private Bag 92 121, Auckland 1142
Telephone: 0-9-375 8999
Facsimile: 0-9-375 8213
Free Phone: 0800 100 523
Email Address: info@colorsteel.co.nz
http://www.colorsteel.co.nz

NOTE: With New Zealand Steel Limited's commitment to continuous improvement, information provided in this publication may be subject to modification. At the time of publication we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique, equipment or statement to reflect improvements in the manufacture and application of coil coated products. The information is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of any conflict between this information and the standard terms and conditions, the standard terms and conditions shall prevail.

This edition of the New Zealand Steel Specifiers and Builders Guide supersedes all previous editions.

NEW ZEALAND STEEL 100% RECYCLABLE
Kiwi to the core

NEW ZEALAND STEEL

NEW ZEALAND MADE

GUTTER

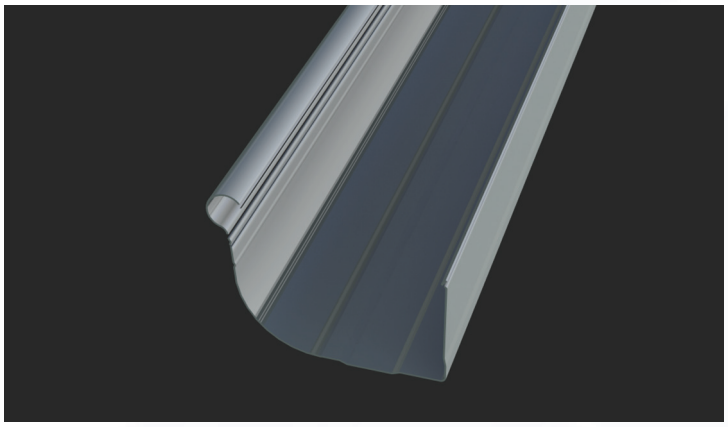
Metalcraft
ROOFING
0800 ROOFNZ (0800 766369)
Issue Date August 2008

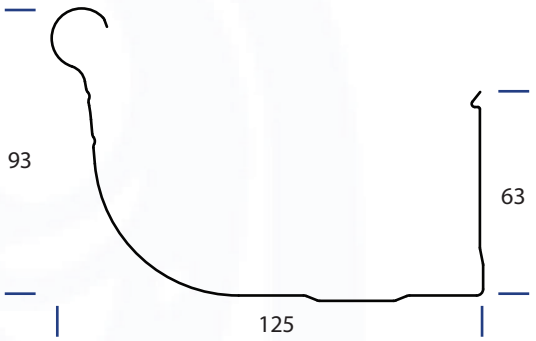
Metalline Quad Gutter

In Christchurch product is known as Colonial Quad Gutter

Metalline Quad Gutter is our most popular residential profile. Whether you are renovating or involved in a new build, this profile will enhance the appearance of your home. The Metalline system uses concealed brackets and is compatible with Metalcraft Metalline Fascia or timber fascia. Metalline Quad Gutter is available with overflow slots to prevent flooding from blockages, and snow straps are stocked to suit this profile if required. Metalline Quad Gutter is available in Zincalume, Galvsteel, Colorsteel Endura and Colorsteel Maxx.

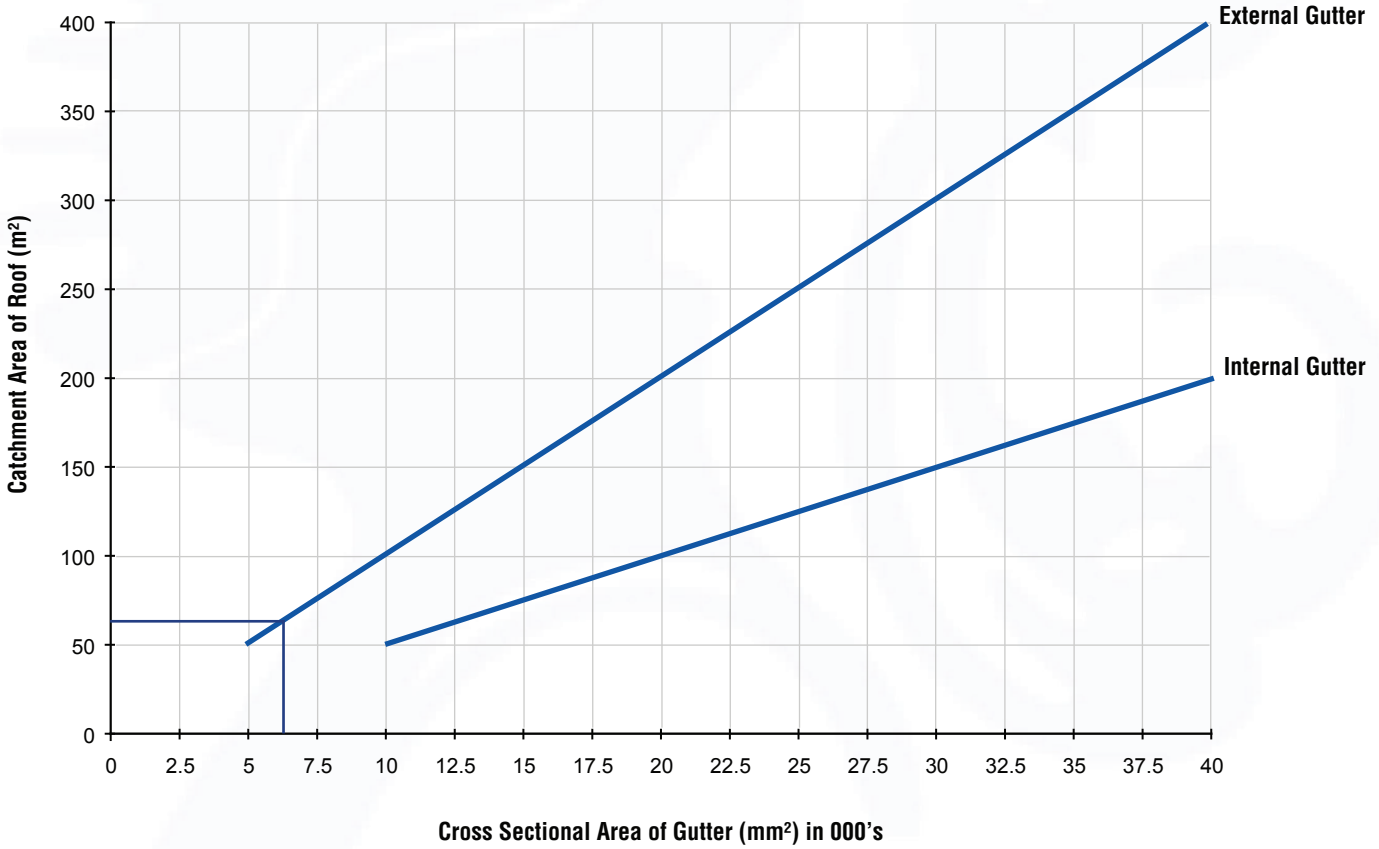
Cross-sectional Area: 5550mm²





all dimensions are nominal

Catchment Area of Roof v Cross Sectional Area of Gutter



Note: The graph is based on a rainfall intensity of 100mm / hour and roof pitches less than 10 degrees.
For more information on roof catchment areas and the effect of gutter cross sectional areas download the document on Roof Drainage

Manufacturing Locations Hamilton, Christchurch

Metalline Quad Gutter is available for purchase from all Metalcraft branch locations

www.metalcraft.net.nz

GAS SPECS

LPG Association of New Zealand

LPG Association Code of Practice
LPGA COP No 2

Installation and maintenance of twin 45kg LPG cylinder systems

July 2014





LPG Association of New Zealand Inc
PO Box 1776
Wellington
New Zealand

Foreword

The performance of LPG cylinder installations is a critical element in ensuring that gas is supplied to appliances reliably and safely. This Code of Practice has been compiled with advice and input from across the industry in New Zealand and from international authorities. The Code of Practice captures the latest knowledge and design features gained from operating experience and investigative work conducted by the LPG Association.

The purpose of this Code of Practice is to:

- Assist with the reduction of phthalates from LPG systems.
- Assist with the removal of condensate at the regulator.
- Assist with the selection of suitable equipment and fittings.
- Assist with recommendations on equipment maintenance.

It should be read in conjunction with AS/NZS 5601.1.

It is intended that gas fitters will use this Code as a best practice guide for the installation and maintenance of domestic and commercial twin pack installations.

Table of Contents

Section 1: Scope, Interpretation, Definition and General

1.1 Scope

This Code of Practice sets out the requirements for installation and servicing of domestic and commercial 45kg twin cylinder LPG installations.

1.2 Definitions

For the purposes of this code the following definitions shall apply:

Accessible:

Access can be gained without hazard or undue difficulty for inspection, repairs, testing, maintenance, renewal or operational purposes.

Breather vent:

An orifice or opening designed to permit atmospheric pressure to act on the diaphragm of a regulator.

Condensate:

The liquid that separates from the gas down stream of any regulator due to the reduction in temperature resulting from pressure reduction.

Condensate trap (also known as a drip leg or tailpipe):

A device installed in a gas line to trap the condensate liquid.

EPA: Meaning the 'Environmental Protection Authority'.

Gasfitting:

Has the same meaning as in the Plumbers, Gasfitters and Drainlayers Act 2006.

Gas load:

The total gas consumption of all downstream appliances.

Gas Pressure Regulator:

A device that automatically regulates the outlet pressure of the gas passing through it to a predetermined value.

Automatic Change-Over Regulator:

Combination valve / first stage gas pressure regulator, fitted to a LPG multiple-cylinder installation which will automatically change over from a cylinder in use to a reserve cylinder at a predetermined pressure. May be included in a one piece automatic changeover valve assembly comprised of automatic changeover valve, first and second stage regulators and may incorporate pressure relief or over pressure shut off capability.

HSNO:

Hazardous Substances and New Organisms Act 1996.

LAB number:

Number allocated by EPA when a cylinder is approved.

Lock-up pressure:

The maximum pressure in an installation when the regulator has closed and all appliances are shut down.

Non Return Valve:

A valve designed to operate automatically to prevent reversal flow in a pipe or fitting.

Phthalates:

Plasticisers mainly DOP (DiOctyl Phthalates) predominantly found in hose inner liners.

POL fitting (Prest-O-Lite):

The common name given for a standard union with left hand thread, used for connection to a 45 Kg cylinder.

Pigtail:

A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.

Pressure:

Pressure as measured above atmospheric pressure, also called gauge pressure.

Twin cylinder installation:

A cylinder installation where the cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

REFERENCED DOCUMENTS

AS/NZS 5601.1	Gas Installations
AS/NZS 1596	The storage and handling of LPG
AS/NZS 1869	Hose and hose assemblies for liquefied petroleum gases (LP Gas), natural gas and town gas
UL144	LP- Gas regulators
UL252, AGA 205	Compressed gas regulators
NF M 88-769	1977 Commercial Propane Installations In Movable Containers – Coupling And Automatic Changeover Device – Construction – Operation – Tests

Section 2: Selection criteria for LPG Cylinders, Pigtails, Change-over valves and Regulators

2.1 Cylinders

(a) All cylinders must comply with the requirements of the EPA's Guide to Gas Cylinders.

(b) Cylinders filled for use in LPG installations must be stamped with an LAB or LABSP number and a current test date.

(c) Consideration should be given to ensure that the demand of the appliances to be connected to the system can be supplied by a 45kg cylinder. As a guide on NZ LPG mix, a 45kg cylinder is capable of supplying a duty cycle of 1kg/50MJ over the period of 1 hour. The instantaneous demand can exceed this rate for short periods. Table J2 of As/NZS 5601.1 provides more guidance on withdrawal rates for propane.

2.2 Pigtails

Refer to clause 4.6 of AS/NZS 5601.1

2.3 Changeover Valves

(a) Changeover valves can be manual or automatic, and may include a non-return valve on each pigtail connection. The valve must comply with the requirements of the Authority.

(b) Changeover valves may be comprised of a first & second stage regulator system in a single body, or as a combination of separate component items.

2.4 Regulators

(a) Regulators shall comply with the requirements of the EPA "Guide to Gas Cylinders".

(b) Regulators shall comply with the requirements of section J6 of AS/NZS 5601.

(c) Consideration must be given to the total expected gas load when sizing the regulator.

(d) A single stage regulator or the first stage of a mult-stage regulator shall be located so that the length of the piping that is subject to cylinder pressure is as short as practicable.

2.5 Condensate Trap

Condensate traps remove condensate and prevent transfer downstream of most condensates present in the LPG. A condensate trap should be installed between the first and second stage regulator if they are separate items. If the regulator is the combined type then a condensate trap should be installed immediately after the regulator.

(a) Condensate traps must have a vertical limb in a direct line to the first stage regulator and be of a minimum volume of V=N X 5.5 where: V – The volume of the vertical limb in Milliliters (ml) N – The number of 45kg cylinders.

(b) The trap must have a plug or other means of removing the condensate.

Examples of length of condensate trap tube for 10 and 13 mm pipe and various numbers of cylinders.

Number of 45 kg cylinders	Length 10 mm pipe	Length 13 mm pipe
Two	140 mm	88 mm
Four	280 mm	180 mm
Six	370 mm	240 mm
Eight	560 mm	350 mm

2.6 Non-return valves

Where the regulator does not prevent LPG flowing across the changeover system, a non-return valve shall be fitted either in each pigtail connection of the changeover valve, or as part of each pigtail.

2.7 Excess flow valves

For flexible pigtails manufactured to AS/NZS 1869 an appropriately sized excess flow valve must be fitted immediately after the outlet of each cylinder valve. The excess flow valve can be an integral part of the pigtail assembly.

Section 3: Location of Cylinders

3.1 Location of Cylinders

Refer to section J3 of AS/NZS 5601.1

3.2 Requirements for cylinder deliveries

Cylinder installations should be located such that the delivery of gas can be made safely by one person without excessive manual handling or risk to customers property. In situations where the following conditions cannot be satisfied, other options such as locating the cylinders remotely and piping to the installation should be considered.

(a) Cylinder installation must be designed to be capable of accommodating the size of cylinder intended for use, for either exchange or insitu fill applications.

(b) A minimum distance of 600mm should be provided between front of the cylinder installation and other structures to allow adequate access for the cylinder delivery to be made.

(c) The cylinder compound should be accessible by cylinder trolley.

(d) Paths should have a minimum width of 600mm.

(e) Steps should have a minimum of 2: 1 tread depth to tread rise. Maximum tread rise should be 125mm.

(f) Steps should not exceed 1.5m total rise.

(g) Paths should not exceed 20 deg gradients.

(h) Total distance from cylinder delivery truck parking area and cylinder installation should not exceed 75m.

(i) It must be possible to legally and safely park the truck while making the delivery.

(j) Access route should be firm and compact with adequate grip even in wet conditions.

(k) The access route should not be over delicate or decorative surfaces such as terracotta.

Section 4: Location and Installation of Cylinders

Refer to section J4 of AS/NZS 5601.1.

4.7 Clearances around Cylinder

Refer to section J5 of AS/NZS 5601.1

4.8 Cylinder Safety Valve Discharge

Refer to section J6 of AS/NZS 5601.1

4.9 Regulators

Refer to section J6 of AS/NZS 5601.1

4.10 Test Points

Refer to section J6 of AS/NZS 5601.1

Section 5: Maintenance of twin LPG Cylinder Installations

5.1 Cylinders

Cylinders should not be filled unless they have been tested and certified within the last ten years.

5.2 Flexible Pigtails manufactured to AS/NZS 1869

(a) Pigtails should be inspected visually for cracks and deterioration every time the cylinder is exchanged or filled.

(b) Pigtail connections should be checked with a soapy solution every time the cylinder is changed or filled.

(c) Pigtails should be replaced six years from the date of manufacture.

5.3 Change-over Valves

Changeover valves should be checked for correct operation in accordance with manufacturers recommendations or in the absence of any recommendation, at least every ten years.

5.4 First Stage Regulators

(a) The first stage regulator to be checked for correct operation in accordance with the manufacturers recommendations, or in the absence of any recommendation at least every ten years.

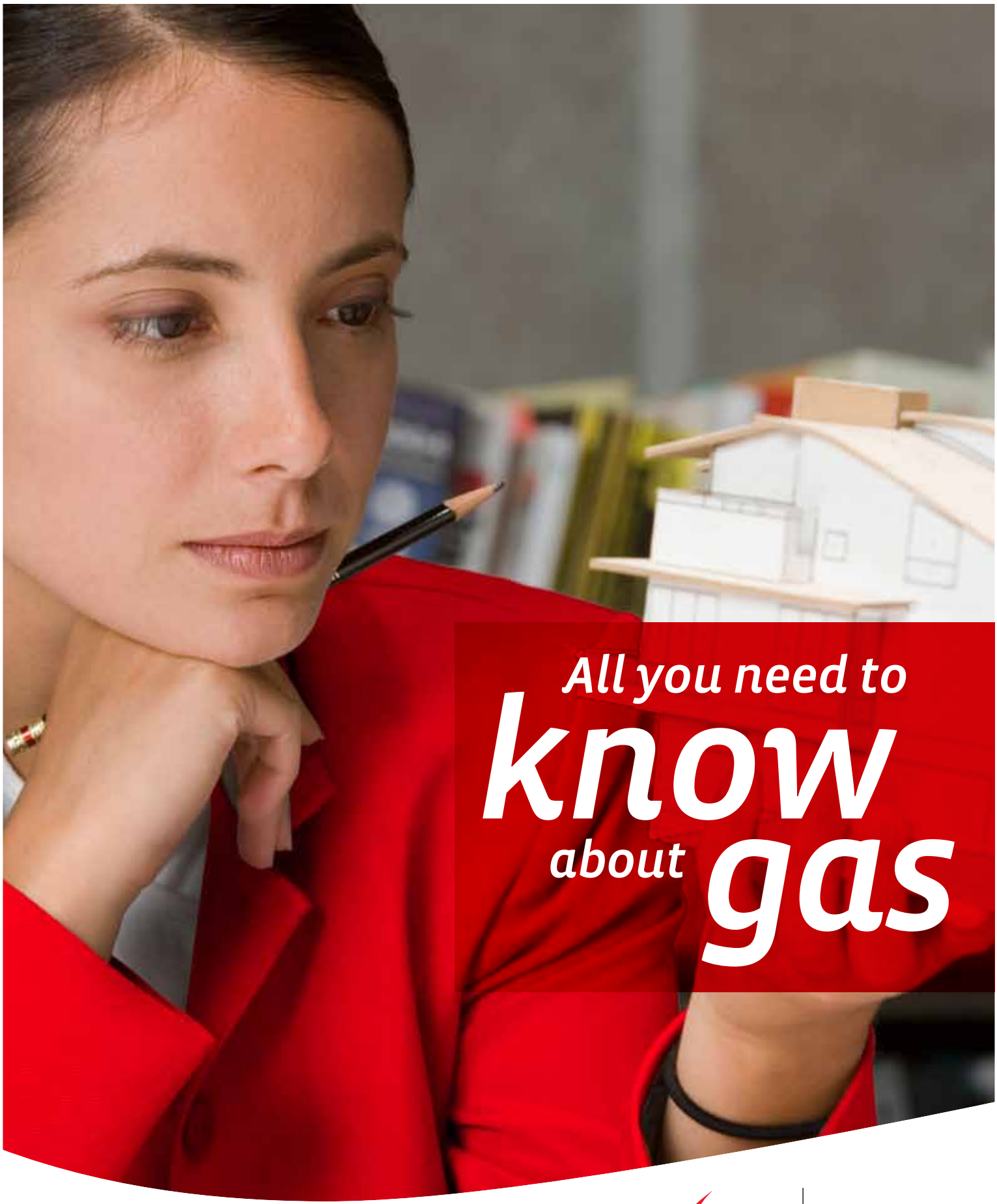
(b) The condensate trap to be drained by removing the drain plug provided) at intervals not exceeding two years, and at every visit of the Gas fitter.

5.5 Second Stage Regulators

The second stage regulator to be checked for correct operation in accordance with the manufacturers recommendations, or in the absence of any recommendation, at least every ten years. The rubber diaphragm and rubber seat must be inspected for deterioration and replaced if necessary.

5.6 Condensate Traps

Condensate traps should be emptied whenever any work is carried out on the installation and at least every 2 years. **NOTE** For the quantities of residue expected to be found in the condensate traps, between 2 to 3 ml maximum, use disposable gloves when emptying the residue into absorbent material. The used absorbent material and the gloves can then be disposed of in general waste.



All you need to know about gas

Contact Energy • February 2010

We're here to help

Whether you're working with clients who are well informed about their energy choices or they're looking to you for guidance, we can help you make good decisions about energy services. That's because we have all the energy options covered – electricity, natural gas and LPG. We'll give you honest, upfront advice on the most efficient options for your project. As well as that, our DualEnergy™ discount means we can offer your customers instant savings if they choose a combination of electricity and natural gas (including Contact Rockgas LPG).

Of course, a supply of electricity is essential from day one of any building project, but the extensive benefits, widespread availability and lifestyle benefits of natural gas and LPG are good reasons to give careful consideration to gas applications as part of the design process.

This guide focuses on the technical requirements for specifying natural gas and LPG. We want to make sure you have all the information you need at your fingertips when you're specifying a new building or advising clients about major renovations.

Please get in touch with us if you want a hand with your design plans for electricity and/or gas services. We have an experienced team ready to help. We'll work with you to make the process easy and straightforward for you and your clients.

Here's how you can get in touch with us:

Phone:	0800 401 234 Monday to Friday, 8.30am to 5.30pm (excludes public holidays)
Email:	energyprojects@contactenergy.co.nz

Benefits of gas

Residential

Hot water

Continuous flow systems

Continuous flow hot water systems can be fuelled by natural gas or LPG. They offer a host of benefits:

:: Economy – Water is heated to the required temperature at the time it's needed. Your client only pays for the hot water they use, not to store hot water they don't need.

:: Continuous supply – Everyone in the house benefits from an endless supply of hot water, no matter how many showers, baths, dishwashing or laundry cycles are run.

:: Control – A digital controller makes it easy to set the temperature. There are no cool surprises in the shower, and it keeps everyone safe from scalding themselves.

:: Space saving – Removing the need for a hot water cylinder means you'll have more space to play with.

Storage systems

These systems are good for situations where clients have a steady demand for hot water throughout the day. They are also ideal where clients have specialist bathroom fittings that demand maximum water pressure, for example massage shower heads. In areas where there is intermittent electrical supply, a storage cylinder is a reliable provider of hot water as no electricity is required. We recommend you contact manufacturers such as Rheem for more information.

Home heating

Ducted central heating

Ducted central heating is an easy way to heat an entire home. It also offers space saving and clean lines through discreet flush-mounted outlets. A digital controller allows the user to tailor the warmth in each room, and for year round comfort, dual cycle units are available for air conditioning.

Flame-effect fires

Nothing beats a gas flame-effect fire. No wood or coal to store, no grate to clean, just heart-warming live flames to make the room the ultimate 'snuggle up' zone.

There is a huge choice of appliances in a wide range of styles, including inserts to convert existing fireplaces into super-clean realistic wood fires.

Radiant heating

Radiant heating is like the sun – the flames heat ceramic elements, which warm rapidly, pushing the heat out into the room. Radiant heaters are ideal for heating larger rooms quickly.

Forced convection heating

Forced convection heaters take in cool air and pump out warm air, circulating it outwards and upwards. Forced convection systems suit a variety of room environments and are ideal for heating all of the air in a room at an equal temperature.

Indoor cooking and outdoor lifestyle

Indoors

Almost every professional kitchen in New Zealand runs on gas. Only a gas flame allows for precise temperature control and infinite heat settings. In an instant, the temperature can go from cold to hot and back again.

Outdoors

There are many options now available for outdoor heating to create the perfect outdoor environment all year round. Wall-mounted or canopy-mounted heaters can be installed onto a reticulated gas network or to a Rockgas Cylinder HomePack.

Commercial

Hot water systems

Gas is a clear winner for heating water. It's ideal for:

- meeting capacity and peak demand
- quick heating of stored cold water
- reducing costs through operating efficiency
- fuelling continuous flow appliances, which eliminates storage losses
- light to heavy demand range.

Water heating appliances come in a range of sizes. Smaller units are suited to small retail businesses, such as hair salons. Mid-sized appliances cater for applications like apartment blocks, dairy sheds, sports facilities and motels. The largest appliances are designed for businesses like large hotels, hospitals, production processes and commercial laundries.

Talk to one of our sales specialists who can assess your requirements and recommend the appliance and installation option that delivers the best solution.

Laundries

To run at peak efficiency, commercial laundries require a reliable supply of very hot water (usually 82°C). Gas-fired hot water systems are your best option. These range from continuous flow units for smaller systems, to high efficiency gas storage units for larger needs, right up to gas-fired boilers for hot water and/or steam generation.

Space heating

Gas heating offers instant, controllable and economic heat at a good price. It's ideal for heating cold, draughty commercial and industrial premises or where precise temperature control is required to optimise crop yield or livestock production. Potential savings can be achieved by combining the inherent economics of gas with thermostats and other electronic controls.

Radiant heating

Radiant heat is like the heat from the sun: it heats objects in its path so you feel warm, even if the surrounding air is cold. This makes radiant heating ideal for spot-heating draughty areas, such as warehouses.

Air conditioning

Air conditioning appliances perform the same function as heat pumps. Their efficient heating and cooling power has seen them become a popular choice for administrative areas, function centres and hospitality sites.

Forced convection heating

Forced convection air heating systems heat the air in a building. They can be direct-fired, indirect-fired or hot water systems. The very wide range of applications for these systems range from heating single rooms or showrooms through to large buildings, schools, rest homes, factories, warehouses, glasshouses and livestock sheds.

Cooking

Gas is indispensable in a commercial kitchen. Only a gas flame allows for precise temperature control and infinite heat settings. In an instant, the temperature can go from cold to hot and back again.

Drying

Gas-fired laundry equipment for drying and ironing is an ideal choice for any business, from the smallest laundromat or motel, to the largest hotel or hospital. Gas-fired clothes dryers save up to 50% over electricity (depending on tariff). In addition, these highly efficient units can dry large loads up to 20% faster than other fuelled dryers.

Gas options and installation

We can supply gas almost anywhere in New Zealand. Natural gas is available to many parts of the North Island through the reticulated network. We also offer a wide range of LPG options and can supply most of the country through our Contact Rockgas branches and franchises. These include the popular HomePack (two 45kg cylinders), multi-cylinder banks, bulk tanks or connection to our commercial and residential reticulation networks in Christchurch, Queenstown and Wanaka.

Reticulated gas

Networks

Natural gas

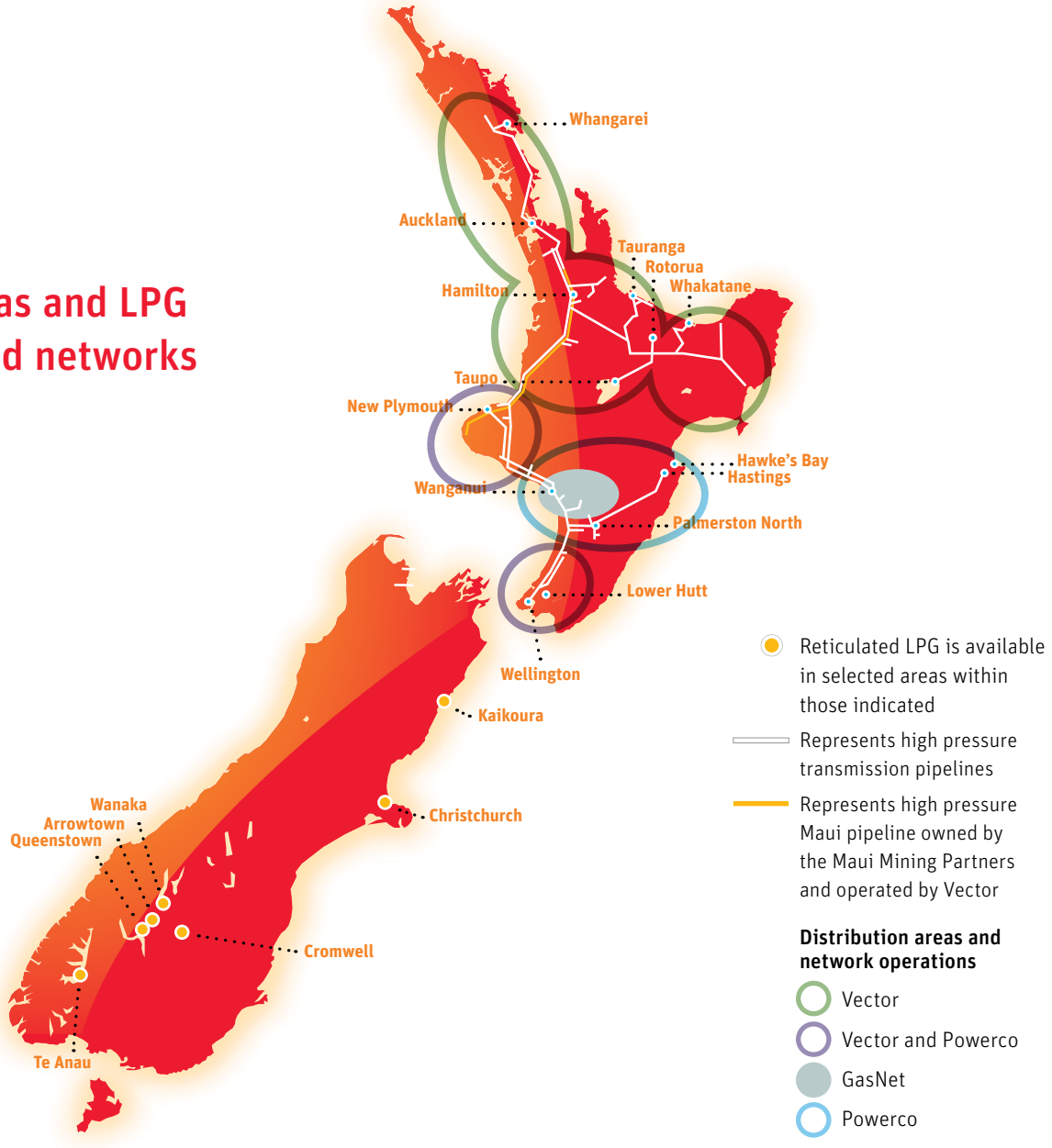
You might be surprised to learn just how widely available piped gas is in New Zealand. The map below shows the coverage of the various natural gas networks, plus our LPG reticulated networks.

LPG networks

Over ten years ago, New Zealand's first major LPG reticulation supply was developed by Rockgas (now part of Contact), with extensive networks in Christchurch and the southern lakes area including Queenstown and the Wanaka area. These networks continue to expand in line with demand. Businesses, in particular, have welcomed these developments. With no peak electricity demand charges to pay, many have been able to reduce their energy costs. Others have been able to reduce smog and pollution by replacing coal, diesel or light fuel oil with cleaner burning LPG.

Reticulation makes sense for large LPG users, offering the convenience of a gas main fuel supply and more efficient use of space by eliminating the need for storage tanks. Contact is currently working on extending its LPG networks to other selected areas.

Natural gas and LPG reticulated networks



Installation

Installation requirements for gas distribution systems are set by the NZ Standard *NZS5258:2003 Gas Distribution Networks*. This covers natural gas and LPG pipelines. This section provides a general overview of the methods used to install pipelines. You can find more detail about the specific requirements for a Rockgas installation in the *Rockgas Construction and Maintenance Manual*. Just email energyprojects@contactenergy.co.nz, and we'll send you a copy.

The two common methods for installing gas distribution systems are directional drilling and open trenching. One of our engineers can help you work out which option is best suited to your project.

Directional drilling

This is the most common form of trenchless installation and uses a mechanical 'mole' to tunnel below ground. The benefit is that only two small holes need to be dug – one at each end of the pipeline – so there is very little disturbance. The downside is the potential for serious damage to existing underground services. Extreme care needs to be taken.

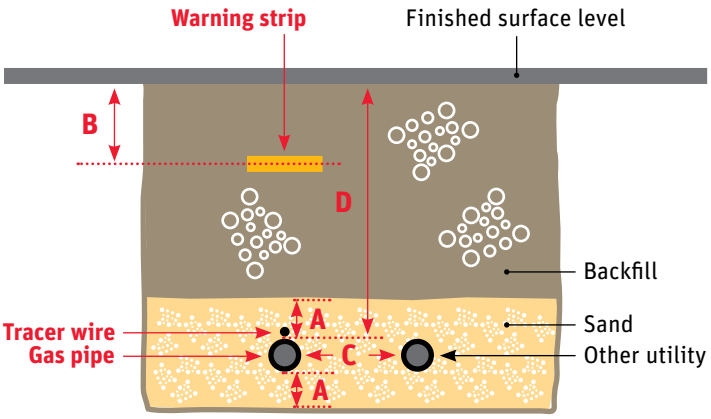
Open trenching

Open trenching involves digging a trench on site to install the gas pipe. It's often used in new developments where all underground services are installed together.

Open trenching can be used through existing streets and is useful in stony areas where directional drilling is not possible. However, it is an expensive option. This is because traffic control, the water table and existing services can make the installation difficult.

Typical services trench*

This diagram shows the specific clearances that need to be met when digging a services trench:



A Sand bedding for pipes 63mm and below – 50mm. 100mm sand bedding for pipes larger than 63mm.

B Warning strip to be located between 150mm and 300mm of the finished surface level.

C Lateral separations when running parallel with other utilities for service connections and mains 200mm diameter and below:

Telecom	200mm
Water	200mm
Storm water	200mm
Sewer	200mm
Other gas	200mm
Power 240V and 400V	300mm
Power >400V	500mm

Minimum lateral separations when running parallel with other utilities for mains above 200mm diameter:

Telecom	300mm
Water	300mm
Storm water	300mm
Sewer	300mm
Other gas	300mm
Power 240V and 400V	300mm
Power >400V	500mm

When crossing other services, a minimum vertical separation of 100mm is required.

D Depth of cover required:

	Mimimum depth of cover	Maximum depth of cover
Inside boundary	500mm	1400mm
Local road 63–200mm diameter	800mm	1400mm
Local road >200mm diameter	1000mm	2000mm
Transit road	1000mm	2000mm

Note: Installation depths outside these ranges may be approved by the engineer on a case-by-case basis.

Gas meters

Gas meters are also known as Gas Measurement Systems (GMS). They are made up of a meter, regulator, filter, isolation valves, fittings and covers.

Residential gas meters

Meter sizes vary depending on the Maximum Hourly Quantity (MHQ) of the appliances installed. Standard gas meters sit proud of the outside wall (usually by 250mm), but in-built mounting kits are available. This gives you the option of partially or fully recessing the meter. This option is particularly useful for houses clad in polystyrene, which don't provide adequate fixing for a standard meter.

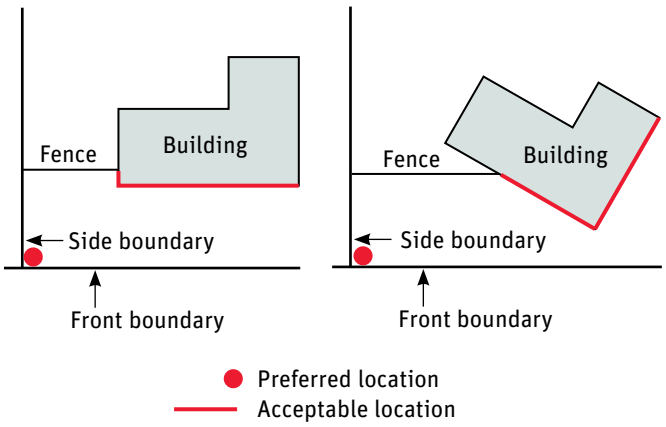
There are specific safety rules for the location of a gas meter. It must be mounted on a wall between 150mm and 2000mm above ground level on the front of the building or within 3000mm of either side. The gas regulator vent also needs to be positioned away from doors and windows, electricity meters and flue terminals. Specific clearances are given in the diagrams on the right.

Please get in touch with us if you would like more details on the types of residential gas meters available.

Commercial and industrial gas meters

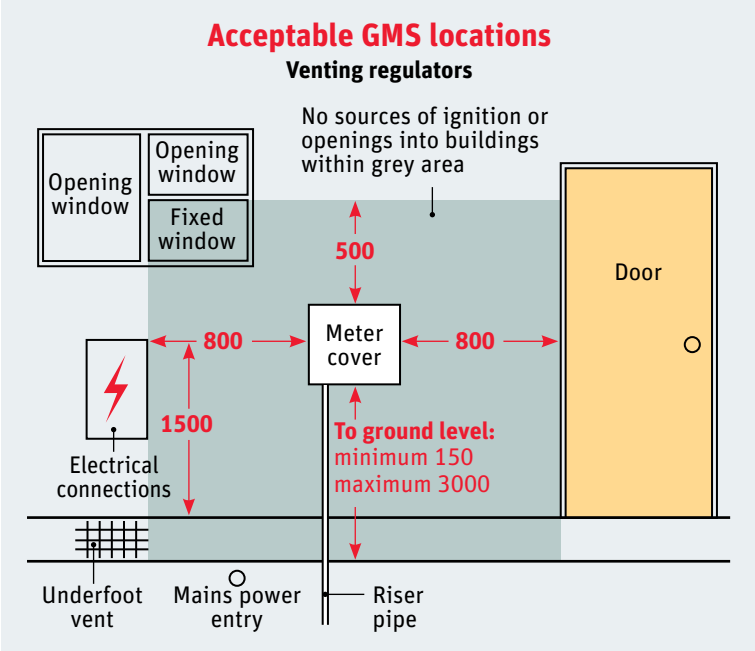
Again, there is a range of commercial and industrial gas meters. The right meter for your project will depend on the likely gas load and the MHQ. We'll work this out for you by assessing the capacity of the equipment you are installing, the gas supply and metering pressure, and factors such as whether the site will use peak or constant loads.

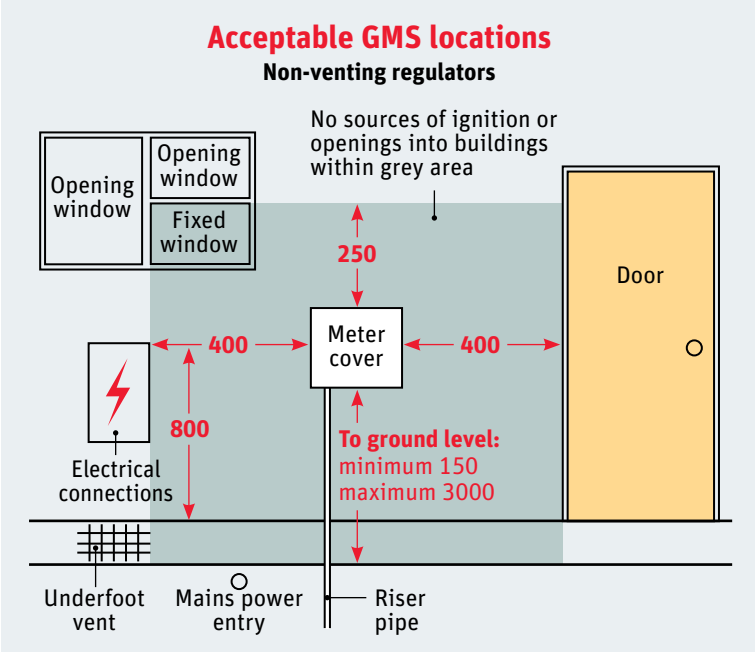
The location will depend in part on the type of meter. Meters are usually installed close to the property boundary. If this is not possible, the meter needs to be located in a well ventilated room on an external wall of the premises, sealed off from the building and accessible from the street.



GMS locations

These diagrams show where gas meters can be located and required clearances. It's a good idea to check the retailer and network requirements, plus the NZ Standards *5258:2003 Gas Distribution Networks* and *5259:2004 Gas Measurement* for more information on acceptable meter locations.





All measurements are in millimetres.

LPG cylinders

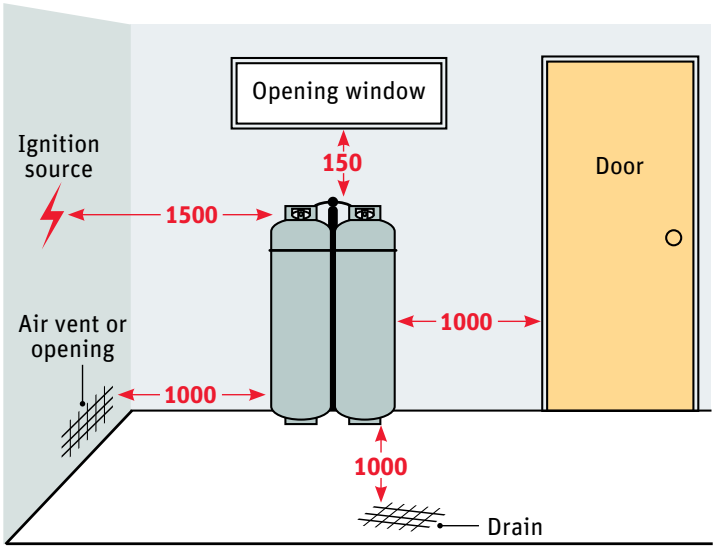
Contact Rockgas HomePack

This system is very popular in a residential setting and for small businesses. The HomePack consists of two 45kg cylinders delivered and connected by us. When the first of the two cylinders is empty, the customer orders a new one, and we exchange the empty cylinder for a full one. We will also undertake a safety check every time we visit. Almost all gas appliances can be connected to a HomePack.

Each gas installation requires a gas fitting certificate issued by a craftsman gasfitter before the gas can be turned on and is available for use.

Choosing a site

This diagram shows the clearances for location of a HomePack.



All measurements are in millimetres.

Each cylinder measures 1260mm high x 360mm wide. We suggest you allow a width of 400mm per cylinder.

Cylinders sit on a concrete slab and are secured with two hooks and a chain. The concrete slab must be at least 50mm above ground level (even if there is a poured concrete pad).

What about site conditions as well?

Installation requirements are covered under NZ Standard *5261:2003 Gas Installation* appendix G1 to G6.

Cylinder refills

Your client will want to know how much LPG they can expect to consume each year. Use this table as a guide.

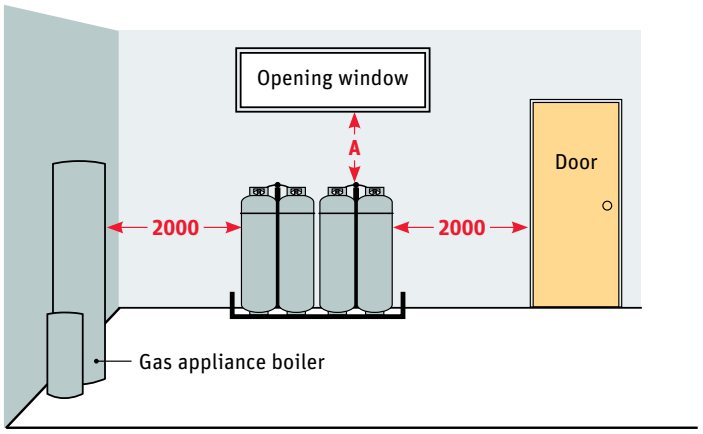
Use of gas	Gas heating	Gas hot water		
		2 person family	4 person family	6 person family
Refills per year	6–9	4–6	6–9	9–12

Multiple 45kg cylinder installation

Multi-cylinder installations are available for commercial connections or large residential connections. These are housed in their own station or cage and can be located anywhere on the property, as long as the area is accessible for delivery, and meets all compliance requirements. Piping is laid from the building to the installation.

Rules on the placement and number of cylinders on site are set out in the Hazardous Substances and New Organisms (HSNO) Act. A Location Test Certificate is required if a site has more than 100kg of LPG storage. This is issued by the Test Certifier employed by the customer and must be approved before cylinders are installed. The customer will also be required to have an approved handler on site.

This diagram shows the clearances for multi cylinder installations if located against a building.



All measurements are in millimetres.

A = 150mm for exchange cylinders or 500mm for cylinders filled on location. The measurement is taken from the top of the cylinder valve.

Bulk tanks

Large industrial and commercial customers may have the option of a bulk supply. Bulk tanks are used for a wide range of applications from horticultural activities, such as heating greenhouses, to running machinery on chicken farms and for laundry activities in the hotel industry.

With a bulk supply, LPG is delivered underground through artificial vaporisers from a bulk storage vessel located on the customer's site. Talk to us if you'd like to explore this option. We can help size your project and advise you on isolation distances and legal requirements.

Ventilation and flueing

The installation requirements for gas burning appliances and equipment are set out in NZ Standard *5261:2003 Gas Installation*. This code of practice covers the important considerations of ventilation and flueing.

All gas flued appliances give off burnt gases that result from the combustion process. These gases are discharged into the atmosphere via metal ducts (flues).

Fresh air also has a role to play in the combustion process, which is why adequate ventilation is needed for gas appliances to work efficiently. Good air flow is also required to circulate heated air within a room to maintain an even temperature.

For these reasons, it's important to follow the manufacturer's specifications when choosing and positioning an appliance. Take note of recommended room sizes: an appliance will not perform well if it is installed in a room that is smaller or larger than it was designed for.

There are certain rooms e.g. bedrooms and bathrooms where gas appliances are unable to be installed. Please refer to *NZS5261:2003*.

Legislation and standards

Industry standards/codes of practice

We've written this document to help make sure gas distribution systems are designed, installed and maintained in a safe manner. The requirements and information set out in this specification are not intended to be all encompassing but they do provide firm guidelines for Contact/Rockgas activities. All activities need to comply with the Standards and requirements set out here or issued in writing by us or our duly appointed agent.

All work must comply fully with statutory and local authority regulations. It is the responsibility of the contractor to maintain a good knowledge of Acts, Regulations, Standards, local body and Transit requirements and any amendments that may be issued from time to time.

Standards New Zealand offers an online library service you can use to select the relevant Standards you need. The online library is automatically updated with revisions and amendments to Standards as soon as they're published, so you can be confident you're viewing the most recent version. There is a subscription fee for using this service. See www.standards.govt.nz for more information.

Charges

A number of factors influence what your client is charged for the convenience of gas in their home or business.

Reticulated gas

- Possible metering service installation charges
- Monthly energy account fees and usage
- Appliances and their installation

LPG cylinders

- Cylinder station set up charges (concrete pavers, chain set, regulator, regulator cover and hoses)
- Cylinder rental fees
- Cylinder gas refills (this depends on the delivery area as well as how much gas is used)
- Appliances and their installation

Our energy partnership

Our energy partnership is the formal process we have in place for tailoring energy requirements for commercial clients. The aim is to provide customers with creative fuel solutions aimed at reducing total energy costs. First, we undertake an energy needs analysis. This provides the information we need to:

- design, build and commission all aspects of the installation, including obtaining all necessary resource consents and regulatory requirements
- provide initial and ongoing training for the client's managers
- provide a reliable and flexible fuel supply
- appoint a skilled and experienced LPG specialist to supervise the customer's account and provide ongoing service and support systems for the installation.

No job is too big, and you might be surprised to know the extent of the help available. We'll work alongside you to understand the aspects of your project that affect energy management. We can develop a detailed cost comparison, fuel supply and installation proposal. We can design, build and commission all aspects of the installation, including obtaining any resource consents and approvals. We can also recommend the best-fit gas appliances and coordinate with suppliers where we do not supply them ourselves.

Most of all, you can count on us to provide a reliable fuel supply and to deliver to your requirements.

While this guide focuses on gas installations, remember we're willing and able to help you with all aspects of all energy services design, including LPG, natural gas and electricity.

Getting in touch

We look forward to working with you to achieve the best possible outcome for you and your customer.

If there's anything you want to talk to us about that is not specifically covered in this manual, or that you want further clarification on, please contact us.

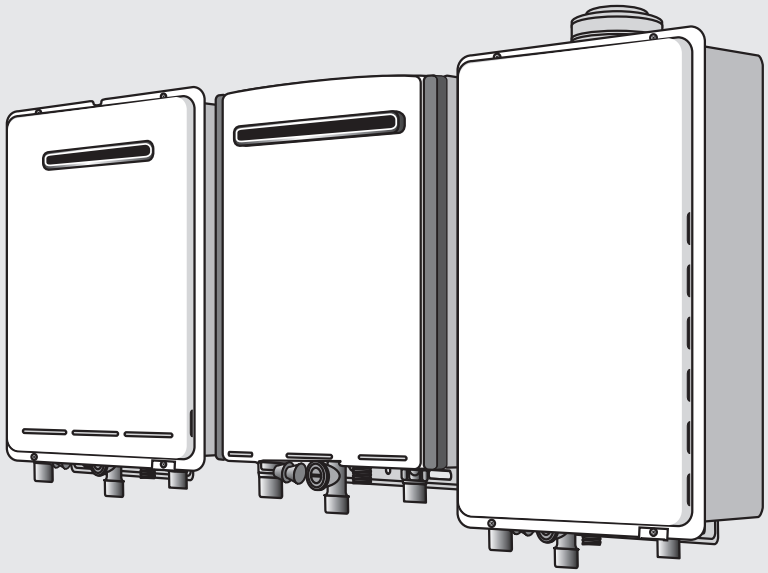
Here's how you can get in touch with us:

Phone:	0800 401 234 Monday to Friday, 8.30am to 5.30pm (excludes public holidays)
Email:	energyprojects@contactenergy.co.nz

Rinnai
EXPERIENCE OUR INNOVATION

Continuous Flow Water Heaters

Installation Manual



To suit models:

Rinnai Infinity VT16	REU-VR1620WG	Rinnai Infinity HD200	REU-VRM2632WC
Rinnai Infinity VT20	REU-VR2024WG	Rinnai Infinity HDi200	REU-VR2632FFUG
Rinnai Infinity VT24	REU-VR2426WG	Rinnai Infinity HD250	REU-VR3237WG
Rinnai Infinity VT26	REU-VR2626WG	Rinnai Infinity EF24	REU-K2430WG
Rinnai Infinity VTa26	REU-VR2626WGT	Rinnai Infinity EF250	REU-KM3237WD
		Rinnai Infinity EFi250	REU-KM3237FFUD

i = internal
a = aggressive water

Models are not suitable as a spa or swimming pool heater.

Internal Rinnai continuous flow internal water heaters ('i' models) must be installed with an approved Rinnai flue system.

Appliance must be installed, commissioned and serviced by a licensed tradesperson in accordance with these instructions and all applicable local rules and regulations.

Your Rinnai continuous flow water heater complies with NZS 5262. A declaration to this effect can be found on the Energy Safety web site; www.energysafety.govt.nz.

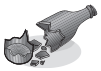
Contents

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

For assistance or additional information contact Rinnai on 0800 TO RINNAI (0800 86 746 624).

Before installation



Unpack appliance and flue components (if applicable) and check for damage. DO NOT install any damaged items.

Check all components have been supplied and that you have the correct gas type.

Read these instructions to get an overview of the steps required before starting the installation. Failure to follow these instructions could cause a malfunction of the appliance. This could result in serious injury and property damage.

For Rinnai continuous flow water heaters used in solar installations, refer 'Recommended Solar System Layout'.

The Rinnai Infinity EF models are 32 kg. Please use care when lifting and seek assistance if required.

This appliance must be installed in accordance with:

- Current AS/NZS3000, AS/NZS3500, NZS 5261 and G12/AS1
- Rinnai installation instructions
- Local regulations and municipal building codes

Installation, service and removal must be by an authorised person only.

Applicable models

These installation instructions apply to the following Rinnai continuous flow water heaters.

Rinnai Infinity VT16	External	REU-VR1620WG
Rinnai Infinity VT20	External	REU-VR2024WG
Rinnai Infinity VT24	External	REU-VR2426WG
Rinnai Infinity VT26	External	REU-VR2626WG
Rinnai Infinity VTa26	External	REU-VR2626WGT
Rinnai Infinity HD200	External	REU-VRM2632WC
Rinnai Infinity HDi200	Internal	REU-VR2632FFUG
Rinnai Infinity HD250	External	REU-VR3237WG
Rinnai Infinity EF24	External	REU-K2430WG
Rinnai Infinity EF250	External	REU-KM3237WD
Rinnai Infinity EFi250	Internal	REU-KM3237FFUD

i = internal
a = aggressive water unit

Appliance location

Installation in environments free from corrosive compounds

Air surrounding the water heater, venting and vent termination(s) is used for combustion and must be free from compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/varnishes, and refrigerants. Therefore Rinnai recommends outdoor models be used for these locations where possible. The water heater, venting and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds.

If it is necessary for a water heater to be located in areas which may contain corrosive compounds, Rinnai strongly recommends the following:

Indoor/internal water heaters:

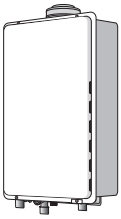
- DO NOT install in areas where contaminated air is present
- Consider before installation where air has the ability to travel within the building
- Chemicals that are corrosive in nature should not be stored or used near the water heater
- Where possible, install the water heater in a sealed closet so that it is free of contaminated indoor air

Outdoor/external water heaters and vent terminations of indoor/internal water heaters:

- Install as far away as possible from exhaust vent hoods
- Install as far away as possible from air inlet vents—corrosive fumes may be released through these vents when air is not being brought in through them
- Chemicals that are corrosive in nature should not be stored or used near the water heater or vent termination

Damage and repair due to corrosive compounds in the air is not covered by warranty.

Internal models



Internal models are designed for indoor installations only. They may be installed in an enclosure if the requirements of NZS 5261 are satisfied. An enclosure is defined as a compartment, enclosed area or partitioned off space primarily used for the installation of the appliance. If installed in an enclosure either internally or externally, the location should be ventilated to allow gas to dissipate.

They must be mounted on a vertical structure with the water and gas connections on the underside pointing downwards. For appliances installed in roof spaces or elevated structures, specific requirements apply. Refer to NZS 5261 section 1.6 for details.

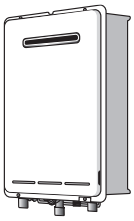
This appliance MUST be used with an approved Rinnai flueing system. The use of a non-Rinnai flueing system may result in a dangerous situation and violates regulations.

This appliance must be located so that the flue terminal exits the building at a suitable point, refer 'Minimum Clearances Required for Flue Terminals', NZS 5261:2003.

Manufacturer's instructions for model REU-KM3237FFUD (EFi250); for reference j, gas appliances over 200 MJ/h input, use ≥ 300 mm.

Appliance location

External models



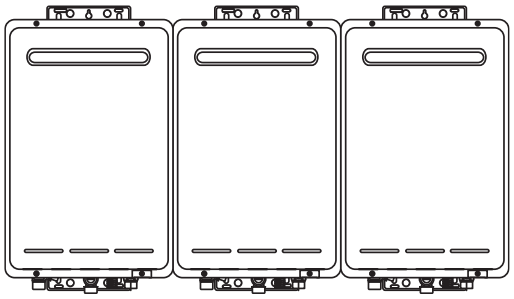
External models are designed for outdoor installations only. They must be located in an above ground open-air situation with natural ventilation, without stagnant areas, and where gas leakage and products of combustion are rapidly dispersed by wind and natural convection.

They must be mounted on a vertical structure with the water and gas connections on the underside pointing downwards. For appliances installed on elevated structures or under floors specific requirements apply. Refer to NZS 5261 for details.

This appliance must be located so that the flue terminal exits the building at a suitable point, refer 'Minimum Clearances Required for Flue Terminals', NZS 5261:2003.

Manufacturer's instructions for model REU-KM3237WD (EF250); for reference j, gas appliances over 200 MJ/h input, use ≥ 300 mm.

When multiple units of the same model are installed on the same vertical face, with the flue terminals at the same height, they can be installed next to each other (as shown).



All models

This appliance must be placed as close as possible to the most frequently used hot water outlet or outlets to minimise the delay for hot water delivery.

For installations where the distance between the water heater and the outlets is considerable, a flow and return system can be used to minimise the waiting time for hot water delivery. Alternatively, multiple appliances can be strategically placed to serve different outlets. Contact Rinnai for further information.

An AC 230 V, 10 Amp, earthed power point must be provided adjacent to the appliance. For outdoor installations, this power point must be weatherproof. It must be clear of the gas and water connections to the appliance and also the flue exhaust and water pressure relief valve. The power cord of the appliance is 1.5 m long.

All appliances must be installed to ensure access can be gained without hazard or undue difficulty for inspection, repair, renewal or operational purposes. Sufficient clearances shall allow access to and removal of all serviceable components.

Appliances should not be mounted higher than 3.5 m above the ground or floor level unless the customer can arrange permanent and safe access or can provide another means of access such as scissor or boom lifts.

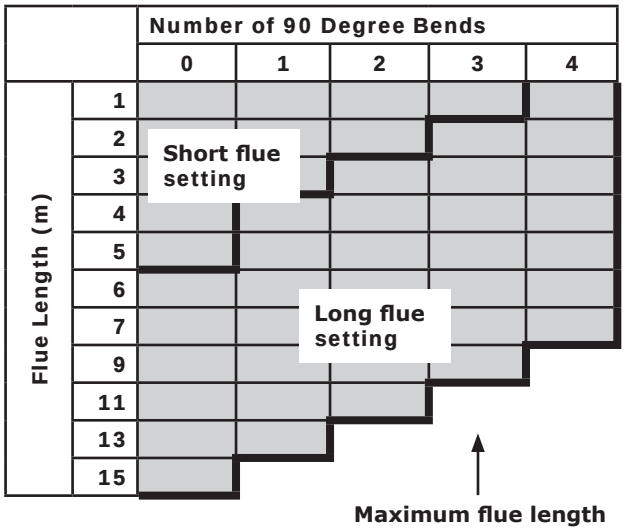
General installation information

Catch pan

It is important a suitably drained catch pan is fitted (especially for internal units) where damage could be caused by discharge from the water heater. Provision must be made for safe disposal of any leaking water to an external location.

Flued water heaters (internal units)

The chart below highlights the maximum flue length and number of bends. It also shows the difference between a short and long flue—this is important if changing settings (dip switches).

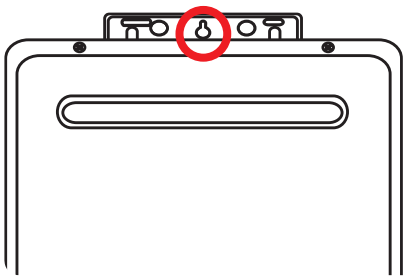


Mounting the appliance

Refer 'Connections and Fittings' for individual appliance weights. The wall or structure on which these units are to be mounted must be capable of supporting these weights and the associated pipe work.

Ensure suitable fixing screws or bolts are used to secure the units to the walls, in accordance with NZS 5261 (section 5.0). Wooden plugs shall not be used.

The top bracket has a keyhole slot (circled below) so the appliance can be positioned by hanging it on one screw while the other screws are secured.



General installation information

Pipe sizing

Refer 'Connections and Fittings' for appliance gas consumption. If the gas pipe sizing is insufficient the customer will not get the full performance benefit. Gas pipe sizing must consider the gas input to this appliance as well as all the other gas appliances in the premises. The gas meter and regulator must be specified for this gas rate. An approved sizing chart such as the one in NZS 5261 should be used.

Water pipe sizing and layout should be performed in accordance with AS/NZS3500. All hot water pipe work should be insulated to optimise performance and energy efficiency.

Water delivery temperature

Local regulations and/or requirements of AS/NZS3500.4 must be considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene. The temperature of these areas may be limited to 55 °C or less.

If the appliance is to deliver water primarily for the purposes of personal hygiene in an early childhood centre, school, nursing home or similar facility as defined in AS/NZ3500.4 a Temperature Limiting Device (TLD), such as a Tempering Valve may be required (even if the appliance is set to 55 °C or less). For these types of applications contact Rinnai.

Requirements for Rinnai Continuous Flow Units Installed Without Controllers

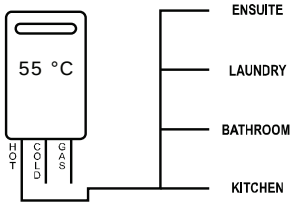


Diagram 1 - 55 °C Appliance

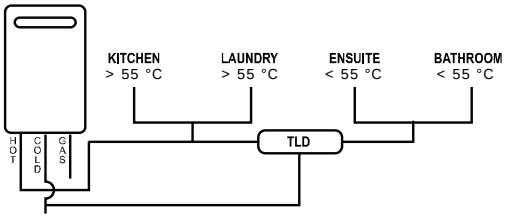


Diagram 2 - Not a 55 °C Appliance
(TLD = Temperature Limiting Device)

When the continuous flow unit is set to deliver water at a temperature higher than 55 °C, it will be necessary to fit a Temperature Limiting Device for delivery to areas used for the purposes of personal hygiene. Refer Department of Building and Housing G12.

Water supply

Refer 'Connections and Fittings' for applicable water pressures. Approved pressure limiting valves may be required if the stated maximum rated water supply pressures are exceeded. To achieve the rated flow, the stated minimum water supply pressures must be supplied. The water heaters will operate at lower pressures but will not achieve the rated flow.

Water chemistry and impurity limits are stated in our detailed warranty statement. Most metropolitan water supplies fall within these requirements. If you are unsure about the quality of the water, please contact Rinnai and we will provide you with the details of an authorised agency who are able to test your water for compliance to Rinnai standards. If sludge or foreign matter is present in the water supply, a suitable filter or strainer should be incorporated in the water supply to the water heater.

Connections and fittings

Models	Gas Consumption MJ/h	Water Supply kPa		Weight kg	Fittings			Condensate
		Min.	Max.		Hot	Cold	Gas	
VT16 Ext REU-VR1620WG	125	120	1000	15	R½ (15 mm)	R½ (15 mm)	R¾ (20 mm)	
VT20 Ext REU-VR2024WG	160	160	1000	16	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VT24 Ext REU-VR2426WG	188	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VT26 Ext REU-VR2626WG	199	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
VTa26 REU-VR2626WGT	199	180	1000	17	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HD200 Ext REU-VRM2632WC	199	140	1000	21	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HDi200 Int REU-VR2632FFUG	195	140	1000	21	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
HD250 Ext REU-VR3237WG	250	200	1000	29	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	
EF24 Ext REU-K2430WG	162	240	1000	27	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)
EF250 Ext REU-KM3237WD	211	240	1000	32	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)
EFi250 Int REU-KM3237FFUD	211	240	1000	32	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)	R½ (15 mm)

Service connection points

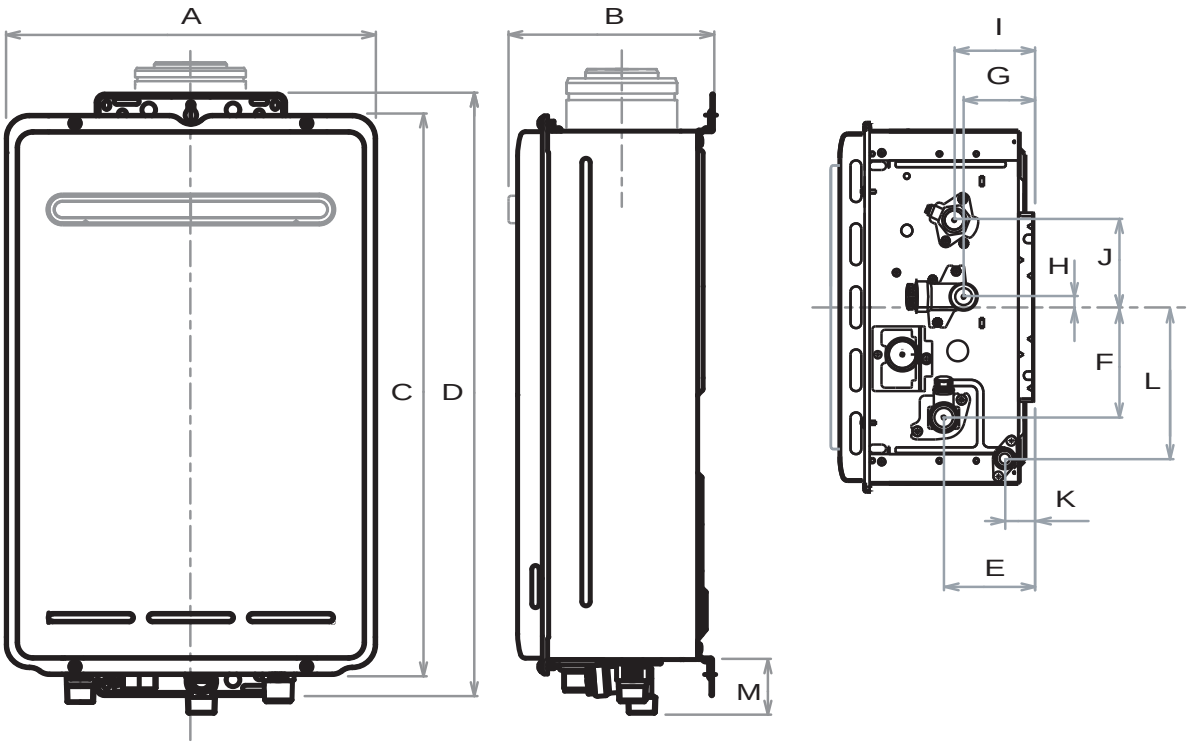
These dimensions are NOT an indication of the pipe sizes required.

An approved full flow isolation valve and disconnection union MUST be fitted to the cold water inlet. A non-return valve is not required unless required by local regulations.

Isolation valves must be fitted so the appliance can be removed.

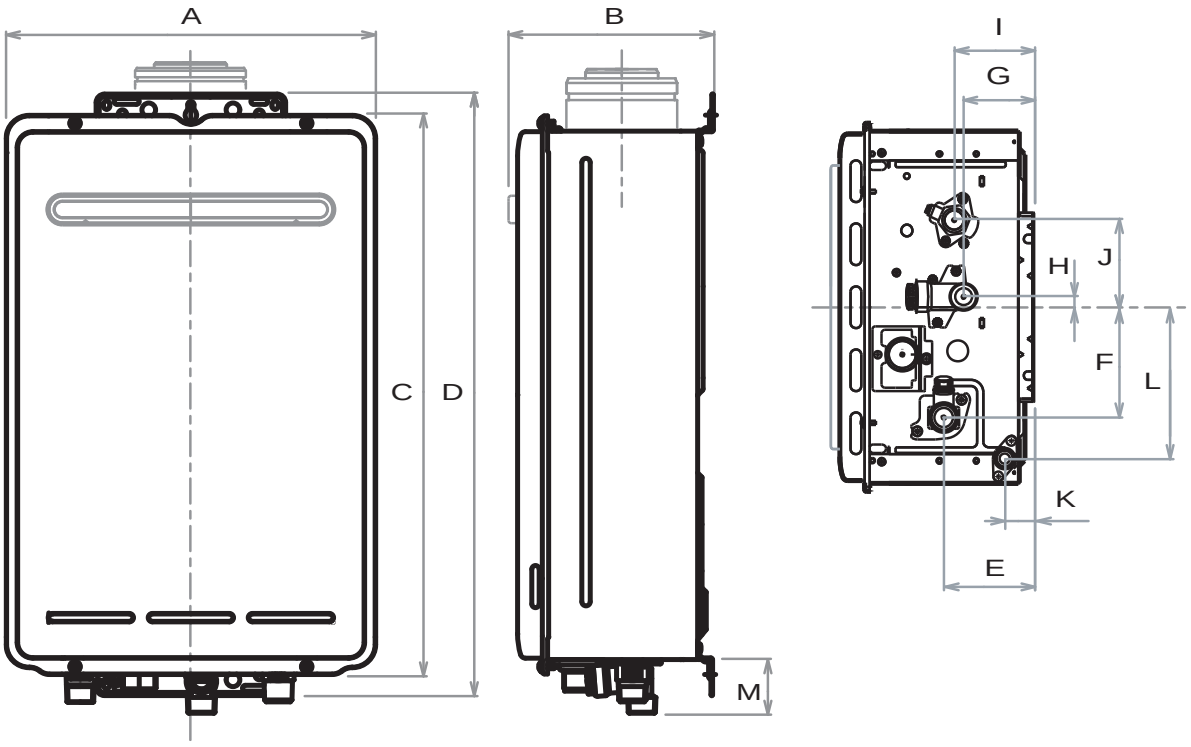
Purge gas and cold water supply lines to remove air and swarf before final connection of the appliance. Swarf in the gas or water supplies may cause damage.

Dimensions - VT and HD range



Dimension (mm)		VT16 Ext (REU-VR1620WG)	VT20 Ext (REU-VR2020WG)	VT24 Ext (REU-VR2426WG)	VT26 Ext (REU-VR2626WG)	VTa26 Ext (REU-VR2626WGT)	HD200 Ext (REU-VRM2632WC)	HDi200 Int (REU-VR2632FFUG)	HD250 Ext (REU-VR3237WG)
A	Width	350	350	350	350	350	350	350	470
B	Depth	194	194	194	194	194	250	235~275	244
C	Height - Unit	530	530	530	530	530	600	600	600
D	Height - Including Brackets	571	571	571	571	571	636	641	644
E	Hot Water Outlet (from wall)	87	87	87	87	87	95	91~131	115
F	Hot Water Outlet (from centre)	105	105	105	105	105	110	110	61
G	Cold Water Inlet (from wall)	68	68	68	68	68	74	70~110	99
H	Cold Water Inlet (from centre)	10	10	10	10	10	27*	27*	52
I	Gas Connection (from wall)	77	77	77	77	77	103	99~139	61
J	Gas Connection (from centre)	83	83	83	83	83	89	89	110
K	Condensate Outlet (from wall)	•	•	•	•	•	•	•	•
L	Condensate Outlet (from centre)	•	•	•	•	•	•	•	•
M	Gas: Length Gas Connection (from base)	40	40	40	40	40	41	41	41
	Cold: Length of Cold Water Inlet (from base)	50	50	50	50	50	51	51	51
	Hot: Length of Hot Water Outlet (from base)	39	39	39	39	39	42	42	42
* this measurement is to the left of the centre line									
HDi200, height of flue spigot from base of unit ≈ 85 mm									

Dimensions - EF range



Dimension (mm)		EF24 Ext (REU-K2430WG)	EF250 Ext (REU-KM3237WD	EFi250 Int (REU-KM3237FFUD)
A	Width	350	470	470
B	Depth	277	283.1	257~307
C	Height - Unit	600	654	654
D	Height - Including Brackets	644	721.6	721.6
E	Hot Water Outlet (from wall)	164.5	100	100~150
F	Hot Water Outlet (from centre)	100	100	100
G	Cold Water Inlet (from wall)	83	64.6	64.6~114.6
H	Cold Water Inlet (from centre)	53*	27.2	27.7
I	Gas Connection (from wall)	70.5	89	89~139
J	Gas Connection (from centre)	25	103.2	103.2
K	Condensate Outlet (from wall)	33	122.6	122.6
L	Condensate Outlet (from centre)	132	195	195
M	Gas: Length Gas Connection (from base)	51	40.2	40.2
	Cold: Length of Cold Water Inlet (from base)	62	50.2	50.2
	Hot: Length of Hot Water Outlet (from base)	41	41.2	41.2
	Condensate Connection Length (from base)	24	22.4	22.4

* this measurement is to the left of the centre line

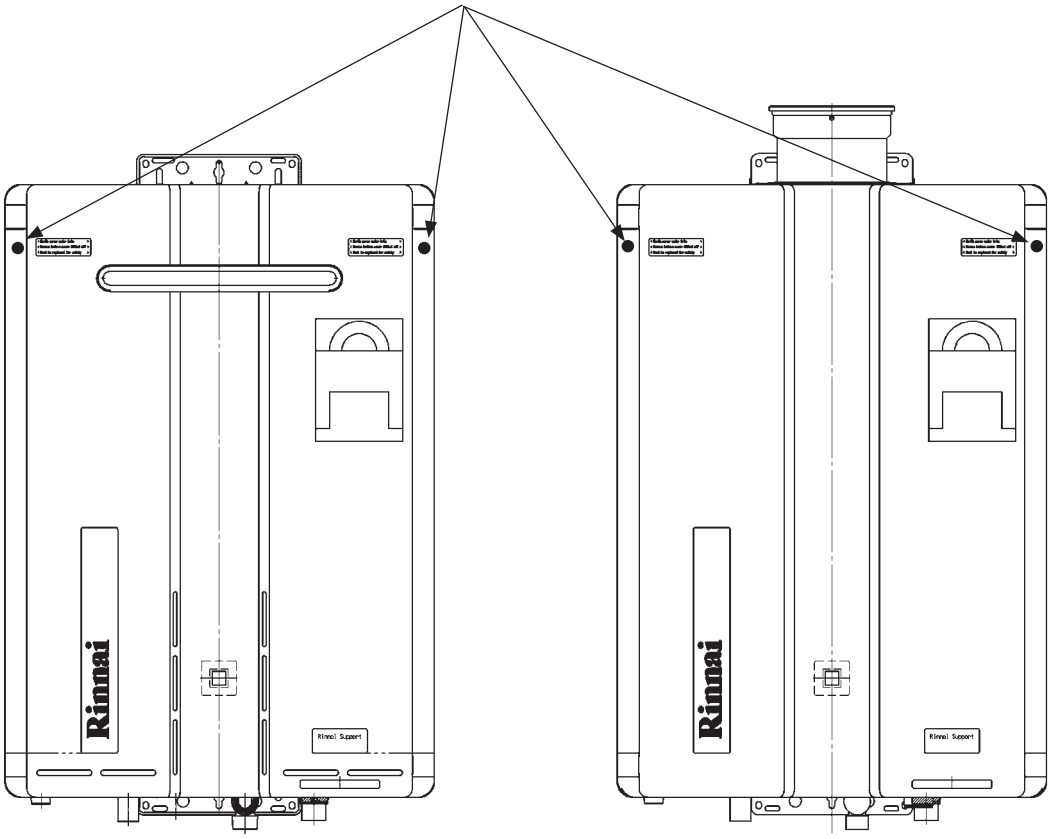
EF250 models: Earthing the unit

Removing the cover and earthing the unit

For the Rinnai condensing continuous flow water heaters (EF250 & EFi250), the earthing screws are located under the side trim, refer image below. First remove the trim and then the earthing screws before lifting off the cover.

WARNING For safe operation of the appliance the earthing screws MUST be replaced.

Earthing screws located under side trim



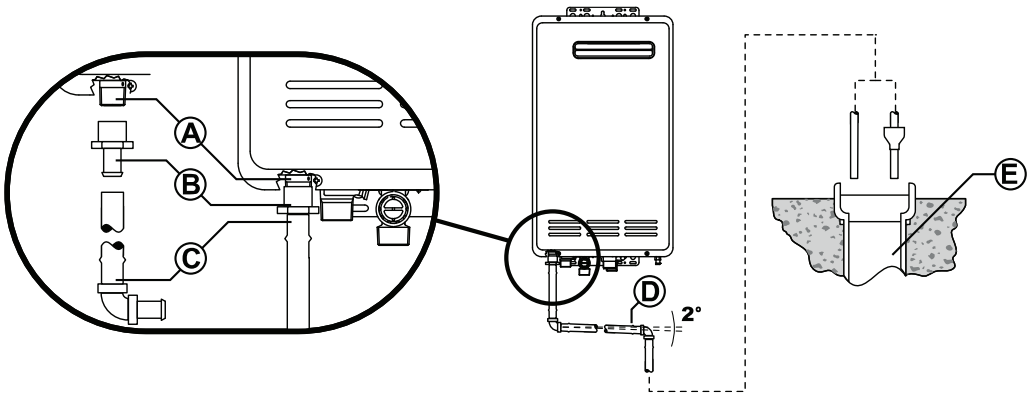
Condensate drain - EF models only

The Rinnai Infinity EF water heaters generate condensate continuously at a rate of up to five litres per hour as a by-product of a highly efficient gas burner. Condensate must be drained via a pipe to a suitable discharge point.

As condensate is a by-product of gas combustion it is mildly acidic. For this reason copper tube and fittings MUST NOT be used as it will corrode. Instead Rinnai recommend plastic pipes and fittings.

Important considerations for condensate drain pipe

Content of AS3500.4.2003 section 5.12 'Temperature/Pressure Relief and Expansion Control Valve Drain Lines' has been used as a guide in preparing these considerations.



A) Water heater drain outlet connection, ½ ″ (15 mm) BSP male.

B) PE ½ ″ BSP (15 mm) female to barbed ignition system connector (13-19 mm) or equivalent plastic fitting.

C) Drain pipe and fittings to match (B).

D) Continuous fall of at least 2° from water heater to discharge point, length and bends in accordance with those stated below.

E) Suitable points of discharge are deemed to be sewers or pits. DO NOT discharge onto electrical connections, earth stakes, copper pipes, concrete paths or into a pond.

Maximum length and changes of direction greater than 45°

Length and Changes of Direction				
Maximum length (m)	9	8	7	6
Maximum changes of direction (> 45°)	3	4	5	6

Condensate drain - EF models only

Installation of a condensate drain

Point of discharge from each drain line shall be located so the release of condensate does not cause a nuisance, is readily discernible and incurs no risk of building damage. There shall be no tap, valve or other restrictions in any line. Each line shall fall continuously from the valve to the approved point of discharge.

Drain lines shall not discharge into a storage water heater safe tray. The end of the condensate drain line shall be:

- Not lower than 200 mm or higher than 300 mm above an unpaved surface; or
- Not lower than 75 mm or higher than 300 mm above a gravel pit and not less than 100 mm in diameter in a paved surface.

Where discharging over a tundish or gully trap, drain lines shall have an air gap of a size at least twice the diameter of a drain line.

Joining of condensate drain lines

Condensate drain lines from multiple water heaters may be joined together provided they conform with the installation requirements above.

Common stack discharge

Where individual heaters are installed in a multistorey building, the condensate drain lines may discharge into a common stack subject to the following:

- Drained to a tundish having a discharge line that is not less than the common stack, directly connected to a fixture trap, and installed in a connection with any adjacent soil or waste stack
- Discharge point of the common stack is readily visible and does not cause any nuisance
- Common stack is vented by extending the pipe upwards, above the roof level

Tundish drain lines

The drain line from any tundish shall be not less than DN 20 or less than one size larger than that of the largest drain line discharging into the tundish. Tundish drain lines shall comply with the installation requirements above.

Areas subject to freezing

In areas where water pipes are prone to freezing, the drain pipe from any valve shall be insulated and not exceed 300 mm in length. It shall discharge into a tundish through an air gap of not less than 75 mm and not exceed more than 150 mm measured from the outlet of the drain pipe to the rim of the tundish.

Controllers - general

Water controllers are available as an optional extra. Universal (Compact), Deluxe and Wireless Controllers can be used together. A maximum of four water controllers can be fitted with the following limitations:

- Maximum of one Kitchen Deluxe Controller (MC-100V)
- Maximum of two Bathroom Deluxe Controllers (BC-100V)
- Only one controller can be set to deliver 55 °C, this cannot be a Bathroom Deluxe Controller

This section refers to wired controllers. For details on Wireless Controllers, refer to separate instructions.

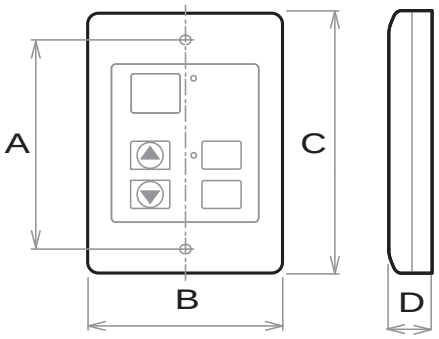
IMPORTANT

Other manufacturers' controllers are not compatible with this appliance.

Do not install controllers:

- near a heat source such as, a cook top, stove or oven (heat, steam, smoke or hot oil may cause damage)
- in direct sunlight
- outdoors unless protection from dust ingress and sunlight are provided
- against a metal wall unless in accordance with AS3000.

Dimensions (mm)



Dim'	Description	Universal (MC-91)	Kitchen Deluxe (MC-100V)	Bathroom Deluxe (BC-100V)
A	Distance between mounting holes	83	83	181
B	Width	90	128	195
C	Height	120	120	97
D	Depth	20	20	22

Controllers - general

Positioning

Controllers must be installed in shaded and clean locations. They should be fitted out of reach of children (suggested height 1.5 m). The Compact and Bathroom Deluxe Controllers are water resistant, however, durability is improved when positioned outside the shower recess or at least 400 mm above the highest part of a sink, basin or bath.

Water controller cables

Water controllers operate at extra low voltage (12 Volts DC) which is supplied from the water heater. Controllers come with 15 m of electrical cable. The appliance end of the controller cables are fitted with spade terminals.

Extension cabling is available as an accessory from Rinnai. Alternatively, a two core sheathed (double insulated) flex with a minimum cross sectional area of 0.5 mm^2 may be used. Maximum individual cable runs:

One controller	= 100 m
Two controllers	= 50 m (per controller)
Three or more controllers	= 20 m (per controller)

Water controller cables are not polarity sensitive.

Controllers - Universal installation

Fitting the Universal (Compact) Controller

1. Determine the most suitable position for the controller.
2. Drill three holes as shown (Fig.1 and Fig.2) for the securing screws and one to provide cable access.
3. When running cable through the access hole ensure the connector end of the cable is located nearest to the controller (Fig.2).
4. Carefully remove the face plate from the controller using a screwdriver (Fig.3).
5. Fix the controller to the wall using appropriate fittings as shown (Fig.4).
6. Remove protective plastic from the controller face as shown (Fig.4) and replace the face plate.

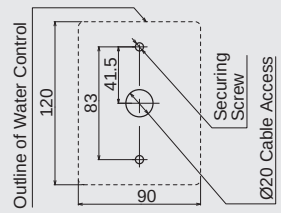


Fig.1

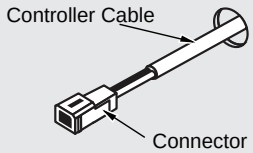


Fig.2

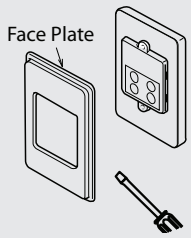


Fig.3

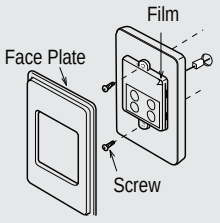
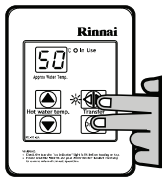


Fig.4

Optional programming of the Universal controller

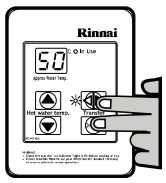
Step 1



Are four controllers connected? **No**, refer step 2. **Yes**, you will need to activate the fourth controller as follows:

1. For the controller in the kitchen only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously until a beep is heard (approximately five seconds).
2. Check display on all four controllers is displaying a temperature when switched on. If any controller displays two dashes, repeat above step.

Step 2

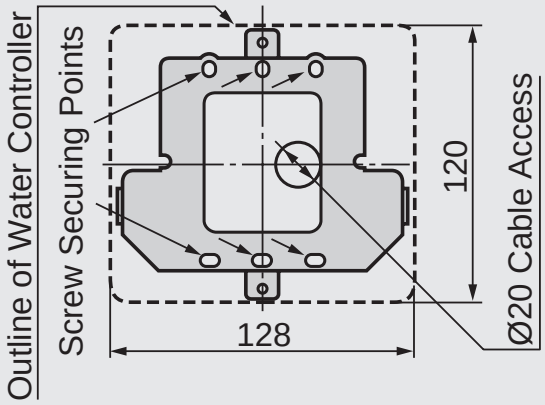


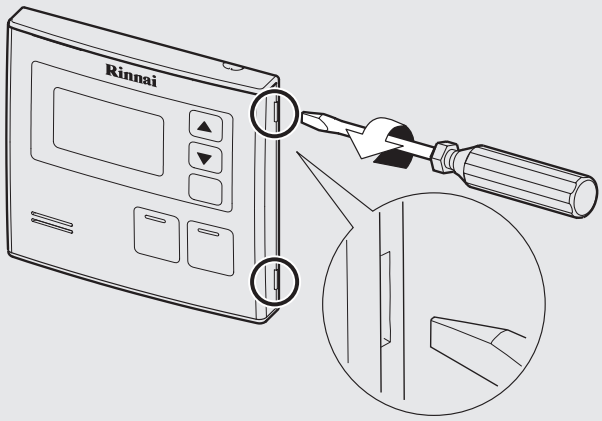
1. For the controller in the kitchen only, press and hold the 'Transfer' and 'On/Off' buttons simultaneously until a beep is heard (approximately five seconds).
2. When the controller fitted in the kitchen is switched on it will be possible to select temperatures higher than 50 °C (at this controller). If not repeat above step.

If the kitchen controller is replaced or swapped repeat the programming procedure.

Controllers - Kitchen Deluxe installation

1. Determine the most suitable position for the controller.
2. Use the wall mounting bracket as a template to mark and drill three holes, locating the cable access hole as shown below.
3. Fix the mounting bracket to the wall using the appropriate fixings.
4. Run the water controller cable through the hole in the wall.
5. Carefully remove face plate from the controller, using a screwdriver as shown below.
6. Connect the controller cable to the kitchen water controller. At this point cables from other controllers (if fitted) may also be connected to the kitchen water terminals, eliminating the need for multiple cable runs directly to the water heater. Feed excess cable lengths into the wall cavity to avoid pinching of cables between the wall and the water controllers.
7. Fasten water controllers to wall mounting bracket. Avoid the use of impact drills and over-tightening of fixings as this may damage the controllers.
8. Remove the protective plastic from the controller face and replace the face plate.





Controllers - Bathroom Deluxe installation

1. Determine the most suitable position for the controller.
2. Mark and drill three holes, locating the cable access hole as shown (Fig.1).
3. When running a cable through the access hole ensure the connector end of the cable is located nearest to the controller (Fig.2).
4. Affix the double sided self-adhesive seal to the back of the controller (Fig.3).
5. Carefully remove the face plate from the controller. Do this by placing your thumbs on the front digital display while hooking your fingers behind the top plate and gently push down as shown (Fig.4). Do not use a screwdriver as this may damage the controller.
6. Connect the cable to the bathroom controller. Feed excess cable lengths into the wall cavity to avoid pinching of cables between the wall and the controller.
7. Fix bathroom controller to the wall using appropriate fixings. Avoid the use of impact drills and over-tightening of fixings as this may damage the controller.
8. Remove the protective plastic from the controller face and replace the face plate.

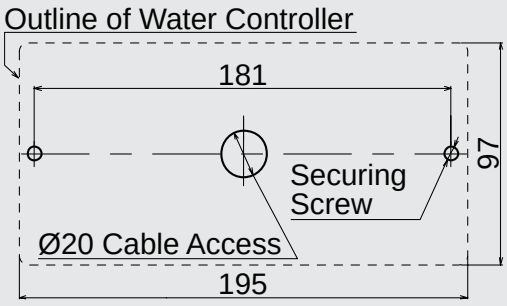


Fig.1

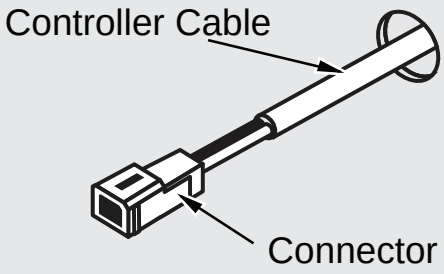


Fig.2

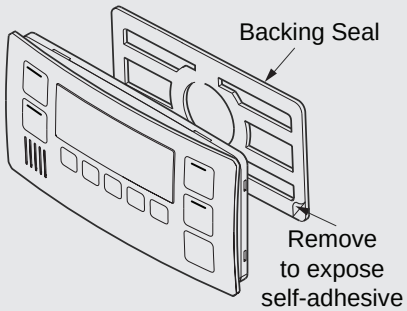


Fig.3

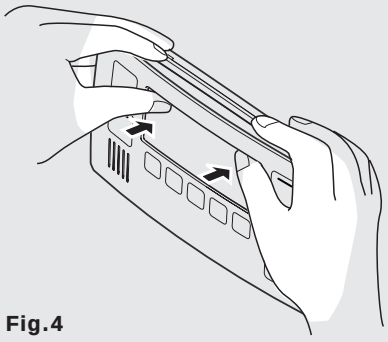


Fig.4

Controllers - communication cables

Communication cables connect the water heater to the water controllers and operate at an extra low voltage (12 Volts DC) which is supplied from the water heater. Communication cables are supplied with the water controllers (15 m) and are fitted with spade terminals for connection to the water heater. Up to two cables can be connected to the cable connector at the water heater.

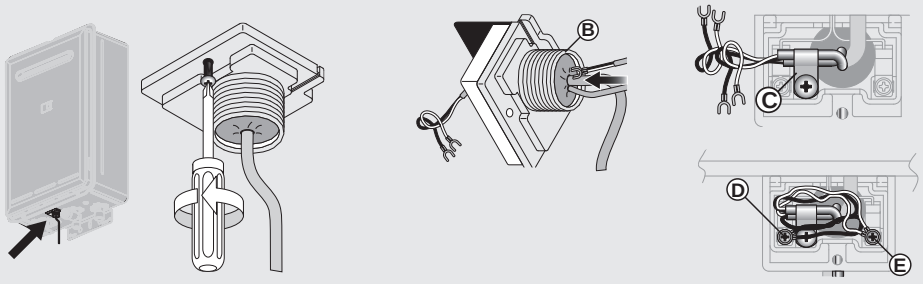
Extension cables are available from Rinnai. Alternatively two core sheathed (double insulated) flex with a minimum cross sectional area of 0.5 mm^2 may be used (refer maximum individual cable lengths on p. 15).

CAUTION Do not attempt to connect cables to the cable connector at the water heater unless the electric power supply to the water heater is switched off otherwise damage to electrical components may occur.

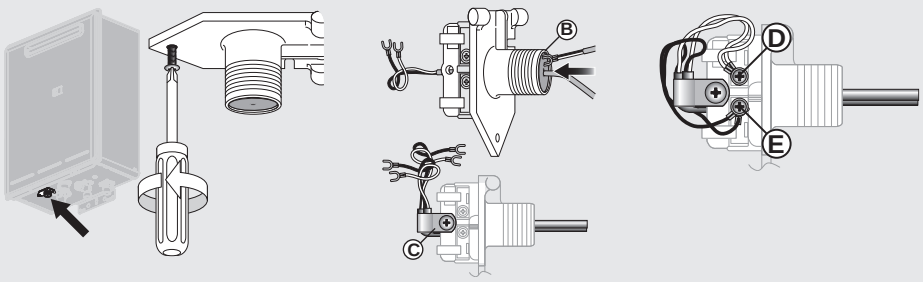
To connect up to two cables to the cable connector

1. Turn off power supply and unplug water heater from the power point.
2. Remove retaining screw of the cable connector at the base of the appliance.
3. Swing the cable connector door open. Thread the cable through the weather seal of the cable access hole (B) in the direction shown allowing sufficient cable length so the cable sheath can be secured with the cable clamp (C) supplied with the transceiver.
4. Loosen screw terminals (D) and (E) and connect cable spade connectors to these terminals and re-tighten. Polarity is not important, either wire colour can be connected to either terminal.
5. Return the cable connector to the original position taking care not to damage cable wires in the process and replace the retaining screw.

Cable connector for VT26, VTa26, VT24, VT20, and VT16



Cable connector for HD250, HD200, HDi200, and EF models



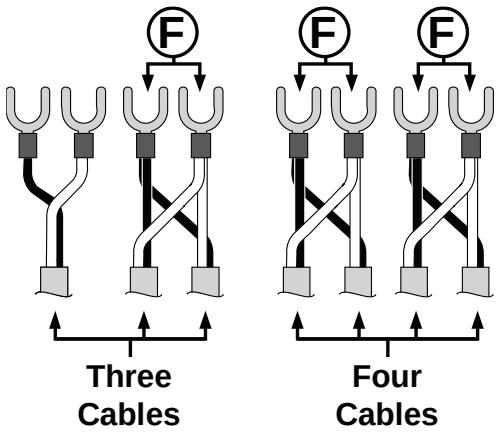
Controllers - communication cables

Connecting three to four controllers

1. Repeat steps 1-3 on previous page.

2. To connect three to four controllers, separate all the cables to be fitted into pairs. Cut off the existing spade connectors from each pair and re-terminate each pair into a new spade connector (F) (available from your local electrical supplier) so there are only two sets of spade connectors. Four spade connectors in total to be terminated.

3. Repeat steps 4 and 5 on previous page.



Spade connectors are available from your local electrical supplier.

Commissioning

Testing

WARNING Ensure building occupants do not have access to the hot water outlets during this procedure.

1. Before final connection of the water heater, purge the gas and hot and cold water supply lines. Swarf in the gas or water supplies may cause damage.
2. Turn on the gas and water supplies and test for leaks (gas and water) near the unit.
3. Isolate gas supply. Remove test point screw located on the gas inlet and attach pressure gauge.
4. Turn the power on at the power point socket and turn on the gas.
5. If water controllers are fitted ensure they are on. Select the maximum delivery temperature and open all available hot water taps including the shower. If water controllers are not fitted, open all available hot water taps.
6. Operate all other gas appliances at their maximum gas rate.
7. With all gas appliances operating on maximum, the pressure should read between 1.0-3.5 kPa (NG) or 2.75-3.5 kPa (LPG). If the pressure is lower, the gas supply is inadequate and the appliance will not operate to specification. It is the responsibility of the installer to check the gas meter, service regulator and pipe work for correct operation and sizing. The gas regulator on the appliance is electronically controlled and factory preset. Under normal circumstances it does not need adjustment during installation.
8. Close all hot water outlets.
9. Inspect and clean the strainer located on the cold water inlet connection. This may need to be repeated to ensure the strainer remains clear, especially on new installations.
10. If water controllers are fitted, it is necessary to test their operation through the complete range of functions (refer operation manual).
11. Confirm hot water delivery temperatures using a thermometer. If controllers are fitted, ensure temperatures exceeding 55 °C cannot be selected on bathroom controllers.
12. After testing is completed, explain to the customer how to operate the water heater and water controllers (if fitted). Ensure your details are completed (p. 26 of the operation manual).

Gas pressure setting

The gas regulator on the appliance is electronically controlled and factory preset. Under normal circumstances it does not need adjustment during installation. Make adjustments only if the unit is not operating correctly and all other causes for incorrect operation have been eliminated. Instructions for gas pressure setting are in the instruction pocket located inside the appliance front cover.

Commissioning checklist

Commission the unit in accordance with the Commissioning Checklist supplied with the appliance (front cover of appliance). Ensure you leave the completed checklist with the customer.

Recommended solar system layout

Warning about hot water

Rinnai continuous flow water heaters configured for solar systems produce hot water at 75 °C and are not suitable for use with water controllers. The household water supply MUST be protected by a suitable tempering valve.

Installation

Rinnai continuous flow water heaters in solar installations are only suitable as gas boosters in solar hot water systems. These models produce water at higher than normal temperatures and must be connected to the hot water supply by use of a suitable tempering valve.

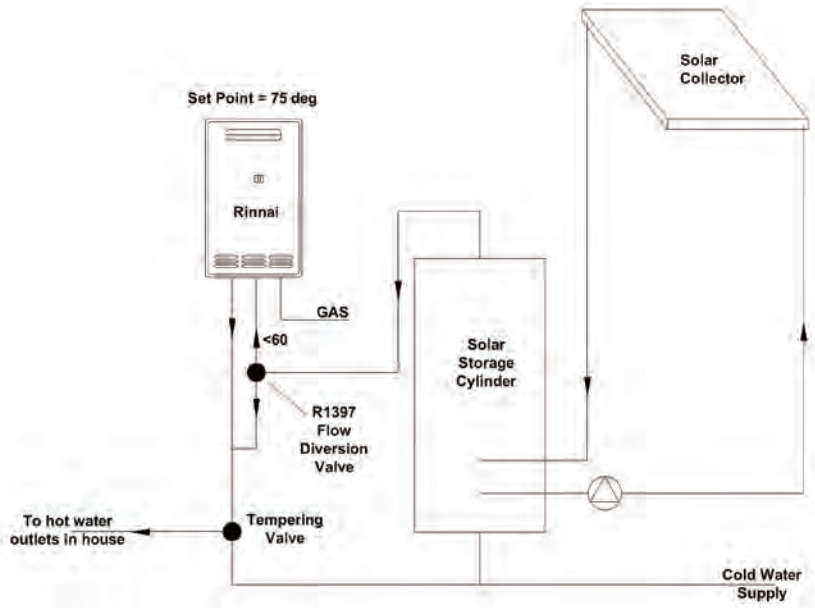
Install a Rinnai continuous flow water heater using a flow diversion valve as shown below. Remember 'B to Boiler' when setting up the flow diversion valve.

The water heater must be set to 75 °C (refer dip switch settings on following pages).

Rinnai water controllers cannot be used with Rinnai Infinity solar units as the:

- Hot water does not always pass through the Rinnai Infinity
- Rinnai Infinity dip switch setting of 75 °C is unable to be adjusted

Recommended system layout using a Rinnai Continuous Flow water Heater and Flow Diversion Valve



System configuration to protect for Legionella

If the system is configured according to the details above it will meet the requirements of the Acceptable Solution G12/AS2 for protection against Legionella. Section 3.5.2 states:

> b) *the instantaneous water heater must heat all water passing through it to not less than 70 °C.*

Dip switch settings - important

Dip switch settings must only be changed by a licensed gasfitter. They have been provided as there may be a requirement to change the temperature of the water delivered from the water heater.

WARNING

Care must be taken when changing the temperature settings as the dip switches are small and can be easily switched or bumped into the wrong position. Please use this information carefully and fully check the operation of the water heater before leaving site including the temperature of the water delivered.

The cover of the water heater will need to be removed to carry out this operation. As this will expose live mains voltage wiring **please disconnect the power supply before removing the front cover**.

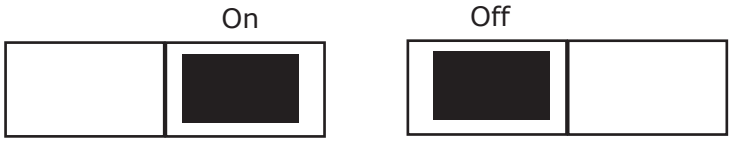
We wish to draw your attention to the requirements of the New Zealand Building Code and compliance document G12. This requires that water delivered to sanitary fixtures be no more than 55 °C. Increasing the water heater set temperature will therefore require that you protect all sanitary fixtures to which the appliance is plumbed with suitable tempering valves or similar.

Rinnai will accept no liability for issues arising out of the use of this dip switch information. If you have any doubts about the performance of the water heater please contact Rinnai by phoning 0800 TO RINNAI (0800 86 746 624).

The setting of water temperatures in domestic model Infinity units (white cases) to greater than 55 °C (with the exception of units set to 75 °C in domestic solar installations) will reduce the warranty period. Refer to warranty information in the Operation Manual for further information.

The following pages detail dip switch settings for the specific Rinnai continuous flow water heaters listed. They ARE NOT applicable for older models.

Legend for Dip Switch Settings (black section indicates position of switch)



Short and long flues

Reference to what is a short and long flue can be found on page 6.

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity VT16	External	REU-VR1620WG
Rinnai Infinity VT20	External	REU-VR2024WG
Rinnai Infinity VT24	External	REU-VR2426WG
Rinnai Infinity VT26	External	REU-VR2626WG
Rinnai Infinity VTa26	External	REU-VR2626WGT
Rinnai Infinity EF24	External	REU-K2430WG

Dip Switch 1: Upper SW(8P)

SW No.	Note						
1		Off					
2	Fixed temperature (with controllers)	Off	Fixed temperature			On	With controllers
3 4 5	Temperature settings	See Chart A					
6		Off					
7	Gas pressure	Off	Normal	On	Forced min.	On	Forced max.
8		Off		Off		On	

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	4	5	No controllers (fixed temp.)	No controllers (fixed temp.)	With controllers (max. set temp.)
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	On	not to be used	40	40
On	On	On	not to be used	55	75

Dip Switch 2: Lower SW(4P)

SW No.	Note				
1	Gas type	Off	LPG	On	NG
2,3,4	Model settings	See Chart B			

Chart B: Model Settings

Dip.SW.2-SW No.(4P)			Model (REU-number)
2	3	4	
Off	Off	Off	VT26 (VR2626WG), VTa26 (VR2626WGT) and EF24 (K2430WG)
Off	On	Off	VT24 (VR2426WG)
Off	Off	On	VT20 (VR2024WG)
Off	On	On	VT16 (VR1620WG)

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity HD200	External	REU-VRM2632WC
Rinnai Infinity HDi200	Internal	REU-VR2632FFUG
Rinnai Infinity HD250	External	REU-VR3237WG

Dip Switch 1: Upper SW(8P)

SW No.	Note							
1	FF model	Flue setting	Off	Long flue (p. 6)		On	Short flue (p. 6)	
	W model	Model setting	Off					
2	Fixed temperature (with controllers)		Off	Fixed temperature		On	With controllers	
3 4 5	Temperature settings		See Chart A					
6			Off					
7	Gas pressure		Off	Normal	On	Forced min.	On	Forced max.
8			Off		Off		On	

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	**4**	**5**	**No controllers (fixed temp.)**	**No controllers (fixed temp.)**	**With controllers (max. set temp.)**
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	On	85, 95[1]	40	40
On	On	On	85	55	75

[1] 95 °C setting only available for HD250 model

Dip Switch 2: Lower SW(4P)

SW No.	Note				
1	Gas type	Off	LPG	On	NG
2,3,4	Model settings	See Chart B			
5,6	Not in use	Off			

Chart B: Model Settings

Dip.SW.2-SW No.(4P)			Model (REU-number)
2	**3**	**4**	
Off	Off	Off	HD250 (VR3237WG)
Off	Off	On	HD200 (VRM2632WC)
Off	On	On	HDi200 (VR2632FFUG)

Dip switch settings

Applicable models and REU-numbers

Rinnai Infinity EF250	External	REU-KM3237WD
Rinnai Infinity EFi250	Internal	REU-KM3237FFUD

Dip Switch 1: Upper SW(8P)

SW No.	Note							
1	Flue settings	Off	EF250 Ext & EFi250 Int long flue (p. 6)			On	EFi250 Internal short flue (p. 6)	
2	Fixed temperature (with controllers)	Off	Fixed temperature			On	With controllers	
3 4 5	Temperature settings	See Chart A						
6	Not in use	Factory setting is 'Off'						
7	Gas pressure	Off	Normal	On	Forced min.	On	Forced max.	
8		Off		Off		On		

Chart A: Temperature Settings

Dip.SW.1-SW No.(8P)			SW No.2 = Off (fixed temperature)	SW No.2 = On (with controllers)	
3	4	5	No controllers (fixed temp.)	No controllers (fixed temp.)	With controllers (max. set temp.)
Off	Off	Off	55	55	55
On	Off	Off	75	55	75
Off	On	Off	65	55	65
On	On	Off	60	55	60
Off	Off	On	50	50	50
On	Off	On	42	42	42
Off	On	Off	95	40	40
On	On	On	85	55	75

Dip Switch 2: Lower SW(6P)

SW No.	Note				
1	Gas type settings	Off	LPG	On	NG
2		Off		Off	
3	Type settings	Off	External	Off	Internal
4		Off		On	
5	Automatic return	Off	Inactive	On	Active
6	External device	Off	S-BMS	On	AH

Rinnai

EXPERIENCE OUR INNOVATION

Consumers: 0800 RINNAI (746 624)
Installers: 0800 TO RINNAI (86 746 624)

Address: 105 Pavilion Drive, Airport Oaks, Mangere, Manukau
PO Box 53177, Auckland Airport, Manukau 2150

Phone: (09) 257 3800
Fax: (09) 257 3899

Email: info@rinnai.co.nz
Website: www.rinnai.co.nz

Installation Manual

070 00012 33049 5

U298-1272(00)

Rinnai

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Suitable for:

• external domestic applications

• high simultaneous hot water demand applications (homes with 1-2 bathrooms)

• mains and low pressure systems

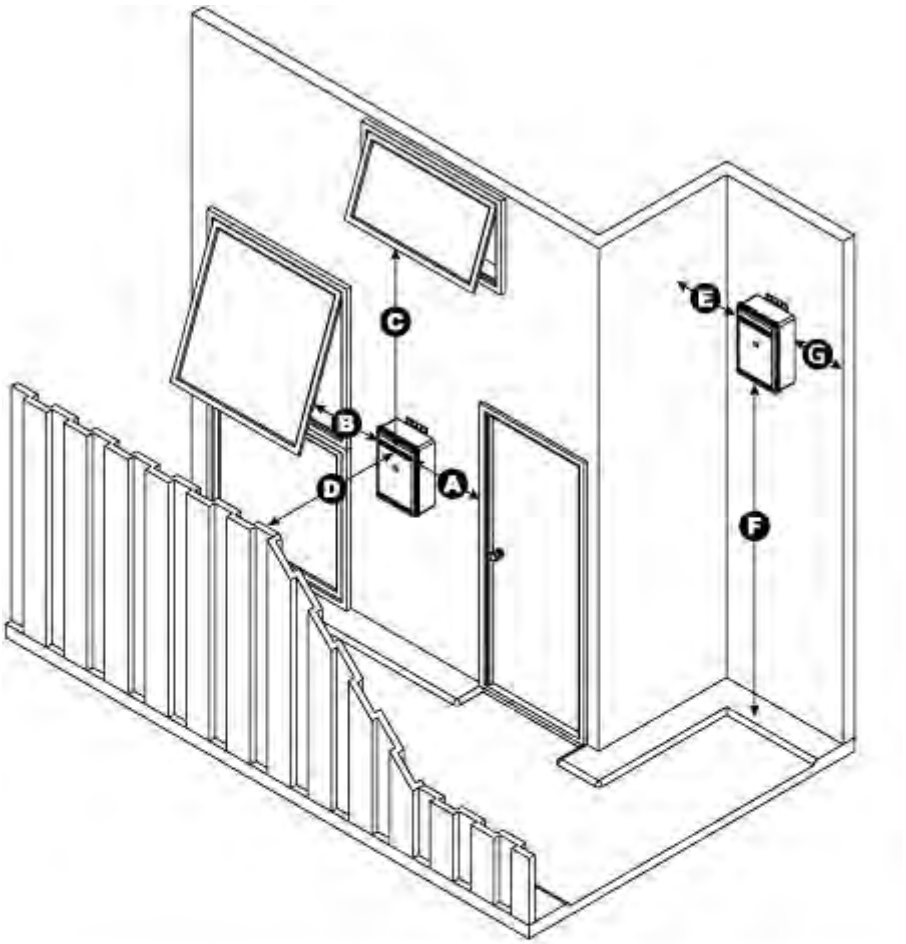
Hard or acidic water will need to be treated to use this product.

Gas type

Available for Natural Gas or LPG. Specify gas type at time of purchase.

General clearances

The following diagram has been provided to assist you in determining where (and if) an external continuous flow water heater can be positioned. If in doubt, prior to purchase, consult a licensed gasfitter.



Dimension	Infinity VT models Infinity HD200 models Infinity EF models	Infinity HD250 models
A	Min. 300 mm	Min. 500 mm
B	Min. 300 mm	Min. 500 mm
C	Min. 1.5 m	Min. 1.5 m
D	Min. 500 mm	Min. 500 mm
E	Min. 300 mm	Min. 300 mm
F	Min. 300 mm*	Min. 300 mm*
G	Min. 300 mm	Min. 300 mm

Clearance below eaves, balconies, and other projections, for all models, is 300 mm.

*Rinnai recommend 1.5 m to give enough clearance for the pipe work, and to safely expel flue gases.

BUILDING WRAPS

Product Data Sheet

WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

Smarter products. Better buildings.
thermakraft.co.nz

CodeMark BRANZ-CM-1002

BRANZ Appraised
Appraisal No.695 [2017]

Watergate Plus

Premium Synthetic Wall wrap

Watergate Plus comes in five roll sizes and two soffit roll sizes:

Width	Length	Coverage
1370mm wide	18.5m long	25m² coverage*
1370mm wide	37.0m long	50m² coverage*
1370mm wide	73.0m long	100m² coverage*
2740mm wide	18.5m long	50m² coverage*
2740mm wide	36.5m long	100m² coverage*

Soffit Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP600025SOF	685mm	36.5m	25m² coverage*
WGP600050SOF	685mm	73m	50m² coverage*

Custom Branding Available – Contact your Thermakraft Representative for more details

* **Note:** M² is the roll size for actual coverage, allow for laps and joins.

Product Description

Watergate Plus is a two-layer laminated wall underlay combining a Polyester non-woven layer with a high quality vapour permeable film. This allows water vapour to pass through from inside the wall cavity whilst water from the exterior is kept out.

The product is simply fixed to timber framing using construction staples and is made to stretch around corners providing a tight fit and reducing the risk of staple tear. It will provide temporary weather protection during construction. (Max 60 Days).

Scope of Use

Watergate Plus can be used as a wall underlay on both residential and commercial buildings within the following scope:

- With absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with timber and steel framing, either directly fixed or in conjunction with an 18mm minimum drained cavity.
- With masonry veneer in accordance with NZS 3604, NZBC Acceptable Solution E2/AS1.
- Situated in NZS3604 Building Wind Zones up to (and including) 'Very High' when used as a standalone flexible underlay, and "Extra High" when used as a flexible underlay over a rigid wall underlay.
- Is suitable as an air barrier in unlined wall spaces.
- Is suitable to be used in conjunction with thermal breaks on steel framed buildings.
- Refer to BRANZ Appraisal No 695 (2017) and CodeMark Certificate for full details.

General

- Fire retardant.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.

Limitations

- Must NOT be used as a roof underlay.
- Must NOT be exposed to the weather or UV for more than 60 days.
- Watergate Plus is NOT a vapour barrier.

Compliance

- Watergate Plus has been appraised with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area.
- Watergate Plus has also been BRANZ appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate-Plus into their design in accordance with the declared properties and the instructions of Thermakraft Limited.
- Refer to BRANZ Appraisal No 695 (2017) and CodeMark Certificate for full details.

Watergate Plus

Premium Synthetic Wall wrap

Flammability Index

Thermakraft Watergate Plus Wall Underlay has an AS 1530 Part 2 Flammability Index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Durability

Meets the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), E2 External Moisture (E2.3.2), and F2 Hazardous Building Materials F2.3.1, providing:

- It is not damaged.
- Installed in accordance with instruction guide.
- Is not left exposed for more than 60 days.
- Installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used.*

* **Note:** specifiers and product user must test for wall cladding system compatibility with the underlay before installation.

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Property Performance

NZBC E2/AS1 Table 23 (NZS2295) Wall Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 100gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	≥ 20mm	≥ 0.1 MN.s/m3
Property Performance	Pass	Pass	Pass	Pass	Pass	Can be used as an air barrier

Thermakraft Limited / 0800 806 595

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CODEMARK BRANZ-CM-1002

BRANZ Appraised Appraisal No.695 [2017]

Issue 7, November 2019

Thermakraft

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Installation Guide

WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

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BRANZ Appraised
Appraisal No.695 [2017]

Installation Guide

Application Method

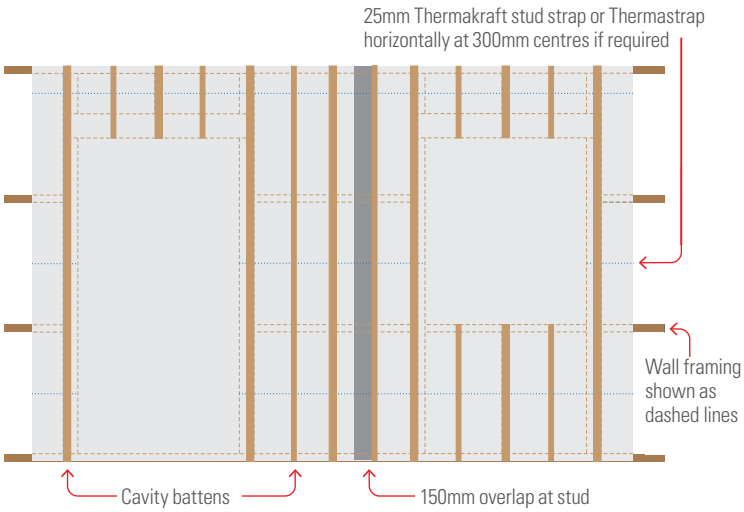
- Fix Watergate Plus underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Watergate Plus underlays are available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to come from below the bottom plate to the top plate.
- When fixing Watergate Plus underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Watergate Plus underlay.
- It is recommended that the Watergate Plus underlay is not cut and prepared for window installation until the arrival of the windows. minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system. **Note:** In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft stud strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 60 days. Watergate Plus underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Watergate Plus underlay must be installed by a licensed building practitioner.

Fix securely to the frame with fasteners such as 6-8mm staples

On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.



Handling and Storage

Thermakraft Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Thermakraft Limited / 0800 806 595

Issue 1, November 2019

CODEMARK

cate No: BRANZ-CM-1002
f Issue: 11 January 2019
on Date: 11 January 2022

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PRODUCT CERTIFICATE

THIS IS TO CERTIFY

THERMAKRAFT WATERGATE PLUS 295 WALL UNDERLAY

DESCRIPTION OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is a white coloured flexible synthetic wall underlay.

USE OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is for use as a flexible wall underlay for timber and steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with direct fixed wall claddings, or with wall claddings installed over a drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- situated in NZS 3604: 2011 Wind Zones up to and including Very High when fixed directly to framing, and Extra High when fixed over a rigid air barrier.

Thermakraft Watergate Plus 295 Wall Underlay is also for use:

- as an air barrier in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c); or,
- as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1, or as a slip layer over a rigid backing for stucco cladding in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 (b).

COMPLIES WITH THE FOLLOWING PROVISIONS OF THE NEW ZEALAND BUILDING CODE (NZBC)

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years (for when the cladding durability requirement is not less than 50 years), B2.3.1 (b), 15 years (for when the cladding durability requirement is 15 years) and B2.3.2 (a).

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c).

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

SUBJECT TO THE FOLLOWING CONDITIONS AND LIMITATIONS

- Thermakraft Watergate Plus 295 Wall Underlay must not be exposed to the weather or ultra violet light for more than 60 days before being covered by the wall cladding.
- Framing studs must be at a maximum of 600 mm centres. Timber framing must be in accordance with NZS 3604: 2011 or to a specific design. Steel framing must be to a specific design.

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REFERENCE DOCUMENTS

This Product Certificate must be read in conjunction with:

- BRANZ Appraisal No. 695 (2017) Thermakraft Watergate Plus 295 Wall Underlay.
- Technical Literature: Thermakraft Watergate Plus 295, Issue 2, dated October 2018.
- Technical Literature: Thermakraft Wall Underlay Installation Procedures, Issue 2, dated November 2018.

APPENDIX A - PRODUCT TECHNICAL DATA

A1: TYPE AND INTENDED USE OF PRODUCT

Thermakraft Watergate Plus 295 Wall Underlay is for use as a flexible wall underlay fixed over timber or steel framed walls to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

Thermakraft Watergate Plus 295 Wall Underlay is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations. Thermakraft Watergate Plus 295 Wall Underlay is suitable for use under cavity-based wall claddings as an absorbent synthetic wall underlay as called up in NZS 2295: 2006, Table 2.4 on steel framed buildings.

A2: PRODUCT SPECIFICATION

Thermakraft Watergate Plus 295 Wall Underlay is a synthetic building underlay manufactured from film coated, non-woven, laminated flexible synthetic fabric. Thermakraft Watergate Plus 295 Wall Underlay is coloured white on the top and bottom faces and is printed with the Watergate Plus 295 logo repeated along the length of the roll.

The product is supplied in rolls 1.370 m wide x 18.5 m, 37.0 m and 73.0 m long; 2.740 m wide x 18.5 m and 36.5 m long and 3.0 m wide x 22.4m long. The rolls are wrapped in clear polythene film.

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A3: PRODUCT SPECIFICATION

TABLE 1: NZBC E2/AS1 TABLE 23 (NZS 2295:2006) REQUIREMENTS

NZBC E2/AS1 Table 23 (NZS 2295: 2006) Wall Underlay Properties	Property Performance Requirement	Actual Property Performance
Vapour Resistance	≤ 7 MN s/g	Pass
Absorbency	≥ 100 g/m2	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): Machine direction = 75 N 1 Cross direction = 56 N (Pass] Tensile strength (Average): Machine direction = 2.2 kN/m (Pass] Cross direction = 1.6 kN/m (Pass]
Air Barrier	Air resistance: ≥ 0.1 MN s/m3	Pass. Thermakraft Watergate Plus 295 Wall Underlay is suitable for use as an air barrier.

Note 1: Pass of BRANZ criteria for edge tear resistance.

A4 INSTALLATION REQUIREMENTS

Installation must be carried out in accordance with the following:

- Technical Literature: Thermakraft Watergate Plus, Issue 2, dated October 2018; and,
- Technical Literature: Thermakraft Wall Underlay Installation Procedures, Issue 2 dated November 2018; and,
- NZBC Acceptable Solution E2/AS1.

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APPENDIX B - OTHER RELEVANT TECHNICAL DATA

B1 STRUCTURE

Thermakraft Watergate Plus 295 Wall Underlay is suitable for use in all Wind Zones of NZS 3604: 2011 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604: 2011 up to, and including, Extra High when used as an overlay for rigid building underlays.

B2 DURABILITY

Thermakraft Watergate Plus 295 Wall Underlay meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building underlays used where the cladding durability requirement is 15 years. Thermakraft Watergate Plus 295 Wall Underlay is expected to have a serviceable life equal to that of the cladding.

B3 CONTROL OF INTERNAL FIRE AND SMOKE SPREAD

Thermakraft Watergate Plus 295 Wall Underlay has an AS 1530 - 1993 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b) for suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

B4 PREVENTION OF FIRE OCCURRING

Separation or protection must be provided to Thermakraft Watergate Plus 295 Wall Underlay from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

APPENDIX C - BASIS OF CODEMARK CERTIFICATION

The following tests have been carried out on Thermakraft Watergate Plus 295 Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23:

- tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1: 1994
- shrinkage in accordance with AS/NZS 4201.3:1994
- resistance to water penetration in accordance with AS/NZS 4201.4: 1994
- surface water absorbency in accordance with AS/NZS 4201.6: 1994
- pH of extract in accordance with AS/NZS 1301.421s: 1998
- air resistance to BS 6538.3:1987.

Ultra-violet (UV) light ageing of wall underlays is a critical evaluation requirement to verify a products continued performance after site construction exposure. UV aging of Thermakraft Watergate Plus 295 Wall Underlay equivalent to 60 days construction site exposure was completed and the range of tests detailed above were repeated after aging.

The Flammability Index of Thermakraft Watergate Plus 295 Wall Underlay has been evaluated in accordance with AS 1530.2 - 1993.

BRANZ Expert Judgement (Materials Scientist) confirmation of compliance to the NZBC Clause B2 Durability Performance Requirements.

The practicability of installation of Thermakraft Watergate Plus 295 Wall Underlay has been assessed by BRANZ and found to be satisfactory.

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The referenced Technical Literature has been examined by BRANZ and found to be satisfactory.

The quality of supply to the market is the responsibility of Thermakraft Limited.

Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.

Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

SOURCES OF INFORMATION

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- ASTM D882:2012 Standard test method for tensile properties of thin plastic sheeting.
- ASTM E96/E96M:2016 Standard test methods for water vapor transmission of materials.
- ASTM G155:2013 Standard practice for operating xenon arc light apparatus for exposure of non-metallic underlays.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, permeable building underlays.
- NZS 3604: 2011 Timber-framed buildings.
- TAPPI T470:1986 Edge tearing resistance of paper (Edge-tear stirrup method)
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 8, 30 November 2018).
- Acceptable Solutions and Verification Methods for New Zealand Building Code Protection from Fire Clauses C1-C6, Ministry of Business, Innovation and Employment, First Edition April 2002 (Amendment 4, 1 January 2017)
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

BRANZ Appraised
Appraisal No. 695 [2017]

WATERGATE PLUS WALL UNDERLAY

Appraisal No. 695 (2017)

Amended 26 February 2020

This Appraisal replaces BRANZ Appraisal No. 695 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or to NASH Building Envelope Solutions for steel framed buildings; and,
- situated in NZS 3604 Wind Zones up to and including Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or NASH Building Envelope Solutions for steel framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to and including Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Thermakraft Limited.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Watergate Plus, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years, B2.3.1 (b), 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in rolls 1.370 m wide x 54.8 and 30 m long, 2.740 m wide x 30 and 18.5 m long and 3 m wide x 30 m long. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- Fixings - staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the wall underlay to the framing.
- Wall underlay restraint (timber frame) - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- Wall underlay restraint (steel frame) - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Watergate Plus. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 1 for material properties.

7.2 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.3 Watergate Plus must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber frame or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel frame. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel frame only).

Table 1: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m²	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m³	Pass. Watergate Plus can be used as an air barrier.

Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings and NASH Building Envelope Solutions Table 23 a steel framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 (b) for timber framing or NASH Building Envelope Solutions Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

9.1 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years for wall underlays used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 (b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber frames or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

14.6 Any damaged areas of Watergate Plus, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to ultra-violet light.

15.2 The flammability Index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- AS 1530.2: 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test - Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, permeable building underlays
- NZS 3604: 2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

BRANZ

Amendments

Amendment No 1, dated 30 November 2018

This Appraisal has been amended to change the Appraisal name to Watergate 295 Synthetic Underlay and to update Table 1.

Amendment No 2, dated 15 February 2019

This Appraisal has been amended to change the Appraisal name to Watergate Plus Wall Underlay

Amendment No 3, dated 26 February 2020

This Appraisal has been amended to change the Appraisal name to Watergate Plus, include roll size of 3.0 m x 30 m, update Table 1 and update NZBC referenced documents.

BRANZ

In the opinion of BRANZ, Watergate Plus Wall Underlay is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Thermakraft Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Thermakraft Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions.
   d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Thermakraft Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
21 September 2017

Product Data Sheet

ALUBAND

Bituminous adhesive flexible window flashing tape.

Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Aluband comes in four roll sizes:

Product Code	Roll Size	Rolls Per Carton
ALU075025	75mm x 25m	12
ALU150010	150mm x 10m	6
ALU150025	150mm x 25m	6
ALU200025	200mm x 25m	4

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BRANZ Appraised
Appraisal No.878 [2019]

Aluband

Bituminous adhesive flexible window flashing tape.

Scope of Use

Thermakraft Aluband Window Flashing Tapes can be used within the following scope:

- Installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier.
- Installed at joinery heads to seal flashing upstands to the wall underlay.
- To assist the overall weathertightness performance of window and door joinery installations.
- To be used in conjunction with air seals and joinery flashing systems. Installer must check for air seal product compatibility with Aluband Window Flashing Tape.
- Thermakraft Aluband Window Flashing Tape must be used with Thermakraft Corner Moulded Pieces (on windowsill corners).
- Situated in NZS3604 Wind Zones up to, and including 'Extra High'.

General

- Compatible with all Thermakraft building underlays.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.
- Thermakraft corner moulds MUST be used at flashing corners (see installation guide).

Limitations

- Must NOT be exposed to the weather/UV for more than 42 days.
- Should be installed when temperatures are above 5ºC.
- NOT designed to overcome poor detailing and workmanship of the window or door joinery installation.
- Bitumen may react with window sealants. Always check compatibility before use.

Compliance:

- Aluband should be used within the product scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1;
- Can be used on buildings constructed with timber and steel framing complying with the NZBC;
- With a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- Can be used with wall cladding systems complying with NZBC Acceptable Solution E2/AS1.

Durability:

- Thermakraft Aluband Window Flashing Tape will meet the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 [a] 50 years*, B2.3.1 [b] 15 years* and B2.3.2), E2 External Moisture Performance and F2 Hazardous Building Materials.

* **Note:** When the external cladding is maintained according to the cladding manufacturer's instructions and the cladding remains weather resistant, Thermakraft Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

- Thermakraft Aluband Window Flashing Tape has a serviceable life expectancy equal to that of the cladding, when installed in accordance with this technical specification and in accordance to the product installation guide, provided it is not exposed to the weather or ultra-violet (UV) light for more than 42 days, or is not damaged upon installation.
- Thermakraft Aluband Window Flashing Tape is designed to work on all building underlays that meet the requirements of NZBC E2/AS1 Table 23, and on all Thermakraft BRANZ Appraised wall underlays.

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Thermakraft Limited / 0800 806 595

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BRANZ Appraised
Appraisal No.878 [2019]

Issue 5, January 2020

Thermakraft

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Installation Guide

ALUBAND

Bituminous adhesive flexible window flashing tape.

Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Product usage

Aluband Window Flashing Tape is installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.

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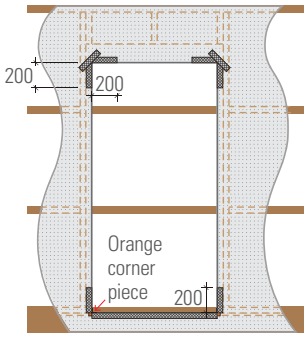
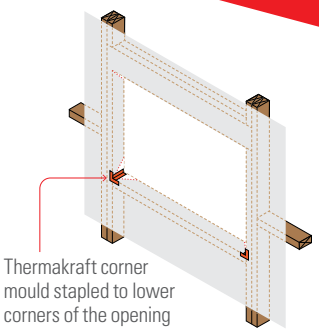
BRANZ Appraised
Appraisal No.878 [2019]

Installation Guide

Application Method

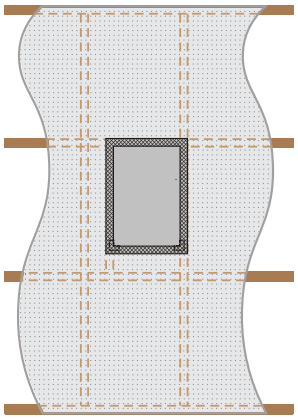
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Thermakraft Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes. Note the following: 150mm wide tape is used for 100mm wide window or door framing, and the 200mm wide tape is used for 140mm to 150mm wide reveals. (With steel framed houses use Double Sided Tape to attach the Thermakraft Aluband Corner Moulded Piece to metal framing).
- Measure 200mm up both jambs, add 400mm to the length of the window sill and cut to suit that measurement.
- First remove the release film from the tape; align the back edge of the tape with the inside edge of the sill.
- Using the Thermakraft Tool, firmly press the tape onto the wall underlay to ensure good adhesion and ensure the tape is fitted tightly into the jamb to sill corners.
- At the sill/jamb corners cut the tape from the external edge of the frame outwards. Fold flaps back onto the wall underlay/air barrier and press tape firmly for good adhesion.
- Proceed to fit the Window Flashing Tape to the top corners of the frame (200mm across lintel x 200mm down jamb).
- For window or door lintel to jamb junction, apply a butterfly using the 75mm wide x 100mm long Aluband. Fix at a 45° angle to the jamb with an overlap at the corner of 3mm.
- Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.
- Window Flashing Tape is used to seal the up stand of the window head flashing to the building underlay. (Refer to the cladding manufacturer's details).
- Aluband must NOT be left exposed to the weather or UV for more than 42 days.

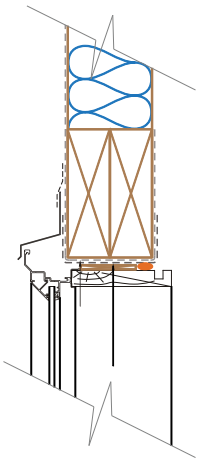




Window and door frames

- Staple orange corner piece to the bottom corner sill. Place tape 200mm up the jambs and across the full width of the sill opening. Align tape with the back of the frame opening.
- At the top corner place tape 200mm down the jamb and 200mm across the lintel. Place a strip of 75mm tape across the top corner.





Application Tips

- Always use the Thermakraft Aluband Window Flashing Tool to apply firm pressure onto the tape during installation. This will ensure proper adhesion of the tape to the building underlay or other substrates.
- Install the Aluband Window Flashing above 5°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Important Information

To assist the adhesion of Aluband window flashing tape, Thermakraft suggests the following two options this is particularly relevant in the following conditions:

- In temperatures below 5°C.
- When adhering to difficult to bond substrates such as rough/uneven surfaces.
- When the tape has been lifted or moved after initial application.

Installation Guide

Application of Heat:

- Press the window sill tape into position in the usual manner.
- Apply a gentle heat, using a heat gun on low heat to the top of the window sill tape.
- Once the adhesive starts to soften use the Thermakraft tool or a roller to firmly press the tape into the wall underlay ensuring good adhesion.
- Take care not to damage the foil face lining.

Difficult to Bond Substrates Surface Preparation:

- Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes.
- Application of Scotch® Super 77™ Spray Adhesive: When installing Aluband Flashing Tapes on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

Adhesives and Sealants:

- After the installation of Aluband window flashing tape, ensure that the edges do NOT come into contact with solvent based sealants or adhesives. Solvents in these products can adversely affect the adhesion or dissolve the bituminous adhesive and cause it to run.
- If the application of solvent based adhesives or sealants are necessary, cover the edges with Thermakraft joining tape or a true aluminium foil tape to form a barrier. With a true aluminium foil tape, the installer must test the bonding strength.
- The installer must check the compatibility of the Aluband window flashing tape with the sealant or adhesive product to ensure the components are fully compatible.

Handling and Storage

Aluband window flashing tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Issue 4, January 2020

BRANZ Appraised
Appraisal No. 878 [2019]

THERMAKRAFT ALUBAND WINDOW FLASHING TAPE

Appraisal No. 878 (2019)

This Appraisal replaces BRANZ Appraisal No. 878 (2014)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Thermakraft Aluband Window Flashing Tape in conjunction with the Thermakraft Corner Moulded Piece is a flexible flashing tape system for use around framed joinery openings as a secondary weather resistant barrier.

1.2 The system is installed into and around the framed joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing. Thermakraft Aluband Window Flashing Tape is also used at joinery heads to seal flashing upstands to the wall underlay.

Scope

2.1 Thermakraft Aluband Window Flashing Tape has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:

- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
- constructed with steel framing subject to specific engineering design with building height and floor plan area scope limitations in accordance with NZBC Acceptable Solution E2/AS1; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing system; and,
- with flexible wall underlays compatible with the flashing tape and complying with the NZBC; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High (refer to Paragraph 7.3).

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Thermakraft Aluband Window Flashing Tape meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Thermakraft Aluband Window Flashing Tape contributes to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Aluband Window Flashing Tape meets this requirement and will not present a health hazard to people.

BRANZ Appraised
Appraisal No. 878 [2019]

Technical Specification

4.1 System components and accessories supplied by Thermakraft Limited are:

- Thermakraft Aluband Window Flashing Tape is a polymeric faced, bituminous modified, self-adhesive tape with a release backing paper. The tape is supplied in rolls 200, 150 and 75 mm wide x 25 m long. The rolls are wrapped in clear polythene film.
- The Thermakraft Corner Moulded Piece is made from inert polyethylene and is coloured orange. It is used in conjunction with the Thermakraft Aluband Window Flashing Tape and building underlays as part of the Thermakraft Aluband Window Flashing Tape system.
- The Thermakraft Tool is used to ensure proper adhesion of the Thermakraft Aluband Window Flashing Tape and to achieve a tight fit into corners.

4.2 Accessories used with the system which are supplied by the installer are:

- Thermakraft Corner Moulded Piece fixings - staples, clouts or other temporary fixings to attach the corner mould to the framing prior to the installation of the Thermakraft Aluband Window Flashing Tape.
- Scotch® Super 77™ Multipurpose Adhesive is a clear spray primer.

Handling and Storage

5.1 Handling and storage of all materials supplied by Thermakraft Limited, whether on or off site, is under the control of the installer. Thermakraft Aluband Window Flashing Tape and accessories must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Thermakraft Aluband Window Flashing Tape. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Thermakraft Aluband Window Flashing Tape meets the requirements of AC148: 2001 which is an alternative solution to the version of AC148 referenced by NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5 (b). The installation method for Thermakraft Aluband Window Flashing Tape is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figures 72A and 72B.

7.2 The use of flexible flashing systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.

7.3 Thermakraft Aluband Window Flashing Tape is suitable for use over flexible wall underlays compatible with the flashing tape in NZS 3604 Wind Zones up to and including Extra High. In the Extra High Wind Zone, the flexible underlay must be installed over a rigid underlay complying with NZBC Acceptable Solution E2/AS1, Table 23.

7.4 Thermakraft Aluband Window Flashing Tape is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing timber.

7.5 Thermakraft Aluband Window Flashing Tape is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. Thermakraft Aluband Window Flashing Tape is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

7.6 When Thermakraft Aluband Window Flashing Tape is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of Thermakraft Aluband Window Flashing Tape both during normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's in-structions and the cladding remains weather resistant, Thermakraft Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

Maintenance

9.1 No maintenance is required for Thermakraft Aluband Window Flashing Tape. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Thermakraft Aluband Window Flashing Tape from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 (b), Thermakraft Aluband Window Flashing Tape may be used.

Installation Information

Installation Skill Level Requirements

12.1 All design and building work must be carried out in accordance with the Thermakraft Aluband Window Flashing Tape Technical Literature and this Appraisal by competent and experienced tradespersons conversant with flashing tapes. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License class.

General

13.1 The selected wall underlay must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The underlay is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.

13.2 Fit a Thermakraft Corner Moulded Piece into each of the bottom corners to create a seal at the corner junction. The corner piece must be fixed to the framing with staples or clouts.

13.3 Before the Thermakraft Aluband Window Flashing Tape is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion. When installing Thermakraft Aluband Window Flashing Tape on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the wall underlay/substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the underlay/substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

13.4 A length of Thermakraft Aluband Window Flashing Tape must be cut to the length of the sill plus 400 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 200 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the building underlay. The Thermakraft Tool must be used to ensure that adequate adhesion of the tape is achieved and that the tape is installed tight into the sill/jamb junction.

13.5 A 400 mm length of Thermakraft Aluband Window Flashing Tape must be installed 200 mm down the jamb and 200 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 100 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.

13.6 Thermakraft Aluband Window Flashing Tape must not be stretched. To avoid wastage, the tape can be lapped 100 mm minimum onto itself without reducing the performance of the Thermakraft Aluband Window Flashing Tape system.

13.7 If the Thermakraft Aluband Window Flashing Tape is exposed to the weather or UV light for more than 42 days, then it must be replaced with new material.

Installation Temperature

13.8 Thermakraft Aluband Window Flashing Tape must not be installed at temperatures of less than 5°C.

Inspections

13.9 The Technical Literature must be referred to during the inspection of Thermakraft Aluband Window Flashing Tape installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

14.1 Testing of Thermakraft Aluband Window Flashing Tape has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC148:2001. The adhesion of Thermakraft Aluband Window Flashing Tape to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays has been tested and found to be satisfactory.

Other Investigations

15.1 An assessment was made of the durability of Thermakraft Aluband Window Flashing Tape by BRANZ technical experts.

15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

16.1 The manufacture of Thermakraft Aluband Window Flashing Tape has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

16.2 The quality of supply to the market is the responsibility of Thermakraft Limited.

16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and wall underlays in accordance with the instructions of the designer.

16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Thermakraft Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
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   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
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   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Thermakraft Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive
Date of Issue:
18 December 2019

Thermakraft™

Product Data Sheet

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as “Building Paper” Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Thermakraft 215 comes in two roll sizes:

1250mm wide	20m long	25m^2 coverage*
1250mm wide	40m long	50m^2 coverage*

* **Note:** m2 is the roll size for actual coverage, allow for laps and joins.

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

Scope of Use (Roof Application)

- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Direct fix or cavity fix.
- Can be used on roofs up to and including NZS 3604 'Extra High' wind zones.
- Refer to installation guide regarding underlay support requirements.
- Will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended.

Scope of Use (Wall Application)

- Suitable for use with both timber and steel framing, either direct fix or in conjunction with an 18mm minimum drained cavity.
- Can be used with absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with masonry veneer in accordance with NZS 3604.
- Suitable for buildings situated in NZS3604 Building Wind Zones up to and including 'Very High'.
- Thermakraft 215 can be used as an air barrier to reduce wind entry and is highly water resistant.
- Will provide temporary weather protection during construction (maximum 28 days).

General

Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.

Limitations

- In roofing applications must NOT be exposed to the weather or UV for more than 7 days.
- In wall applications must NOT be exposed to the weather or UV for more than 28 days.
- Must NOT be used under translucent sheeting.
- Is not fire retardant.
- Not suitable for School Property, please refer to Ministry of Education; Weather-Tightness & Durability requirements for School Property.

Compliance

Thermakraft 215 meets the requirements of NZBC Acceptable Solutions E2/AS1, Table 23 and NZS 2295:2006 for both wall & roof underlay.

Durability

Meets the Performance Requirements of NZBC Clause B2, Durability B2.3.1 (a) 50 years and B2.3.1 (b) 15 years, E2 External Moisture providing:

- It is installed in accordance to Thermakraft Installation Guide.
- Run length is no greater than 10 meters.
- Is NOT left exposed to the weather or UV for more than 7 days on roof.
- Is NOT left exposed to the weather or UV for more than 28 days on walls.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is installed in accordance with the MRM Code of Practice.
- Is compatible with the cladding system used.*

* **Note:** roof cladding system compatibility testing must be done first before installation.

Property Performance

NZBC E2/AS1 Wall Underlay Requirements					
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	**Absorbency**	**Vapour Resistance**	**pH of Extract**	**Shrinkage**	**Water Resistance**
Property Performance Requirement	≥ 150gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	100mm for 24 hrs
Property Performance	Pass	Pass	Pass	Pass	Pass

NZS2295:2006 Classification			
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	**Flammability Index**	**Wind Zone**	**NZS2295:2006 Index**
Property Performance Requirement		R2	R2
Property Performance	Non-Fire Retardant	Up to Extra High	Self - Support

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation method to prevent moisture build-up in the roof cavities.

Factors which adversely affect the condensation risk in roofing systems include:

- Humid, and/or cold climatic regions.
- Warm/Skillion roof construction.
- Low roof cavity air volume and restricted air movement.
- Omitting Vapour Control Layers.
- Occupancy activities which have high moisture loading on conditioned spaces.
- Ceiling penetrations and entry of warm air into roof cavities.
- Low pitched roof.
- Bulk insulation.
- Building structures ability to naturally dry construction moisture.

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer to MRM Code of Practice for details.

For passive ventilation of the roof space, it is recommended that all roof underlays are terminated at the ridge, and if not it should be slit or slotted to allow for passive ventilation. (For further information refer to the NZ MRM Roofing Code of Practice).

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

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Issue 6, November 2019

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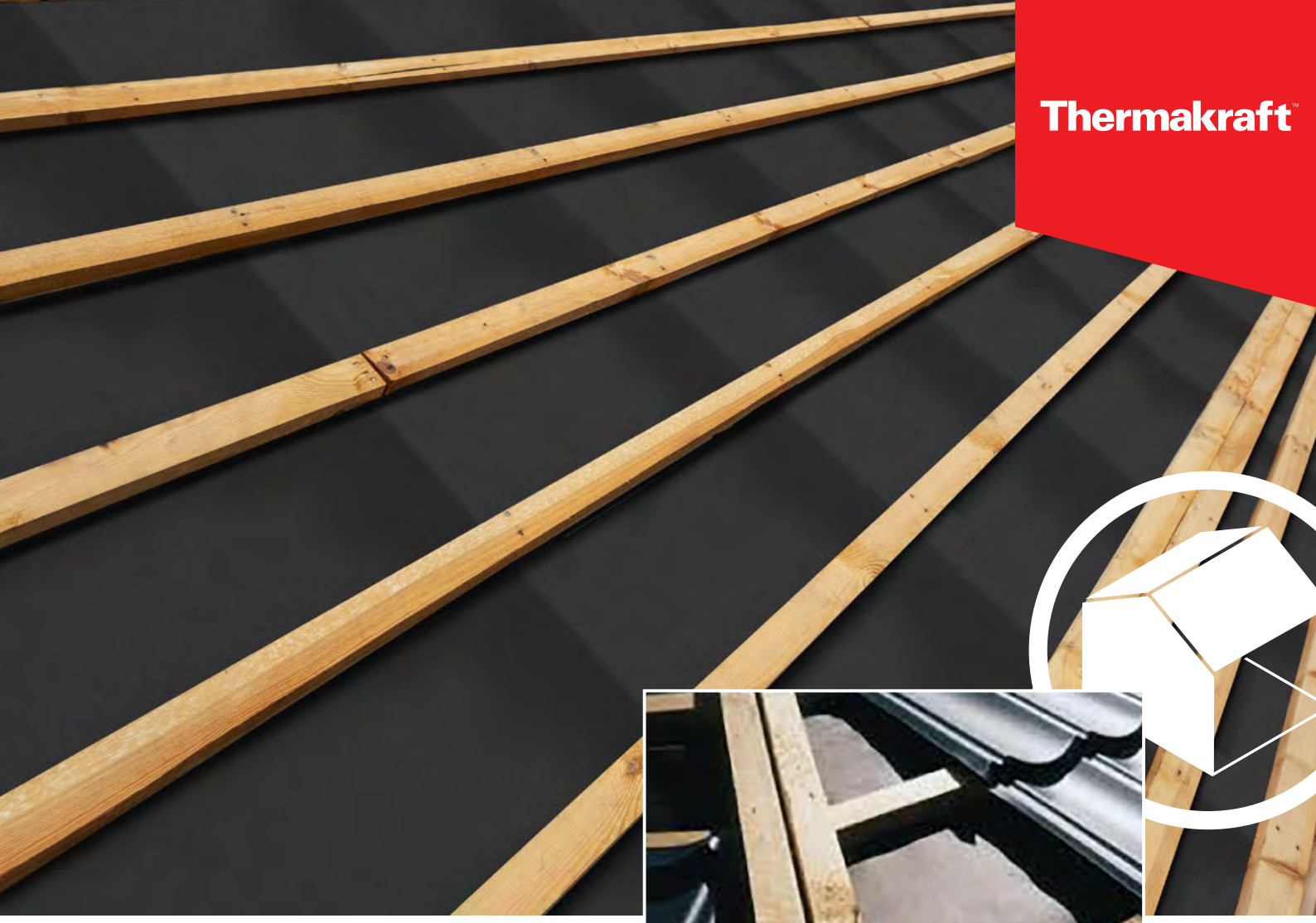

Installation Guide

THERMAKRAFT 215

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Commonly referred to as “Building Paper” Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

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Installation Guide

Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used in direct fix or cavity fix for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof Pitch	Span	Underlay Support Required	
		Horizontally Installed	Vertically Installed
≥ 10°	> 1200mm	Yes	Yes
	≤ 1200mm	No	No
< 10° (Min 3°)	> 1200mm	Yes	Yes
	≤ 1200mm	No	Yes

- Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.
  Note: Thermakraft 215 can move downwards. To prevent this, it must be "Captured" by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Thermakraft recommend using AUSMESH Safety Mesh, AUSNET hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.
- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the MRM Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

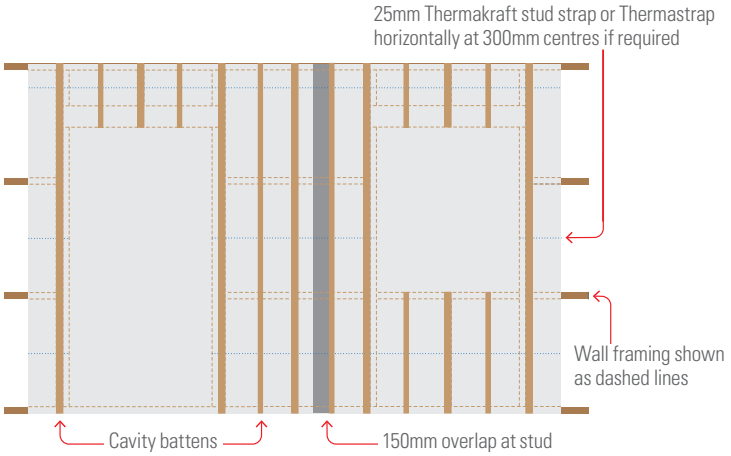
- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with NZS 3604.
- Do NOT Run Thermakraft 215 longer than 10m in length.

Application Method (Wall)

- Fix Thermakraft 215 underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.

Installation Guide

- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215 underlay is not cut and prepared for window installation until the arrival of the windows. minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft stud strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 28 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- For wall cavity systems where stud spacings are greater than 450mm centres, another means of restraint is required on the flexible underlay to prevent insulation bulge (refer to E2/AS1).
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Thermakraft Limited / 0800 806 595

Issue 1, November 2019

INTERIOR WATER PROOFING

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed)

Single component undertile waterproofing membrane

Low VOC content – meets Green Building Council of Australia Green Star IEQ-13 requirements

Fast drying one part acrylic membrane

Class III membrane, conforms to the requirements of AS4858:2004 Wet Area Membranes

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ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

PRODUCT DESCRIPTION

ARDEX WPM 001 (Superflex Premixed) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. ARDEX WPM 001 has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. ARDEX WPM 001 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification once cured.

ARDEX WPM 001 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. ARDEX WPM 001 is one of the fastest drying one part acrylic membranes on the market – normally ready to tile in 48 hours @ 23°C.

WPM 001 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

- Fast drying ARDEX WPM 001 can be tiled over in 48 hours in non critical areas*.
- Fibre reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement class 3 membrane as per AS 4858: 2004 Wet Area Membranes.
- Advanced acrylic: Will not re-emulsify once cured.
- Designed for tiling – Fully compatible with ARDEX tile adhesive systems.
- Water based, safe to use, low odour and easy cleaning.
- Conforms to the requirements of Australian Standards 4858: 2004 Wet Area Membranes.

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance levels

Commercial and residential.

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls and floors.

Substrates

Concrete	Cured for min. 28 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. External wet concrete should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Renders and screeds	Cured for min. 7 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Fibre cement	Wet area grade fibre cement.
Plasterboard	Wet area grade only.
Plywood	Structural plywood (PAA branded), marine grade or other wet area grade only. Special preparation is required – contact ARDEX. Not recommended for external use (refer ARDEX).
Particleboard	Wet area grade, internal use only (special preparation is required – contact ARDEX). Not recommended for external use (refer ARDEX).
Permanent Immersion	In conditions of permanent immersion, it is recommended that ARDEX WPM 002 (Superflex Two Part) is used. Must be covered with tiles for full immersion.

Contact ARDEX for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

ARDEX WPM 001 (Superflex Premixed)

The waterproofing membrane shall be ARDEX WPM 001: a one part acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Single component: 20kg (approx 15 litres) or 6.5kg (approx 5 litres).

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

TABLE 1

	Thickness per coat		Total dry film thickness (2 coats)	Theoretical coverage		Per unit
	Dry film	Wet film		Per coat	For 2 coats	
FLOORS	0.5mm	1.0mm	1.0mm	15m²	7.5m²	20kg(15L) unit
WALLS	0.25mm	0.5mm	0.5mm	30m²	15m²	20kg(15L) unit

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 20kg (15 litre) unit will cover approximately 7.5–15m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated. Refer Table 1.

DRYING TIMES

Recoat time

1–2 hours at (23°C / 50% RH) between first and second coats. Alternatively, if a woven cloth reinforcement mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. ARDEX WPM 001 is totally dry in 48 hours at 23°C / 50% RH, but can take up to 72 hours at 10°C / 50% RH in corners or for thick films.

Fully cured

The shower should not be used until the membrane has reached its full strength. ARDEX WPM 001 membrane is fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with ARDEX HydrEpoxy WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the ARDEX WPM 001.

For substrates or situations other than those listed contact ARDEX.

SAFETY DATA

ARDEX WPM 001 is non-hazardous and non dangerous. In case of skin contact, flush with running water. In case of irritation seek medical advice. If swallowed, immediately give a glass of water.

Additional information is listed in the Material Safety Data Sheet.

QUALITY PRODUCT

ARDEX WPM 001 is manufactured and tested to ARDEX procedures which are maintained in accordance with Quality System Standard ISO 9001.

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with ARDEX instructions and in applications for which they are intended.

APPLICATION

Apply ARDEX WPM 001 by brush or roller. A medium nap (12–15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat, application must consist of laying the product onto the surface and lightly finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25–40 micrometers wet film thickness while ARDEX WPM 001 needs to be applied at between 0.5 and 1.0mm per coat depending on product and application (Refer Table 1).

Critical areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian Standards 3740 – 2004 Waterproofing of wet areas within residential buildings.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall and floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards.
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2mtr) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cure silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS 3740 and the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.
12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.
14. Apply the membrane 1800mm up the walls or 80mm above the height of the shower rose within the shower recess.
15. Install the shower screen to inside edge of the hob.

Fig.1 – Shower recess – Critical areas

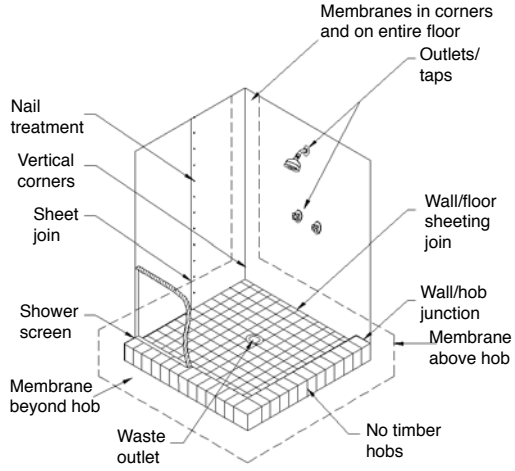
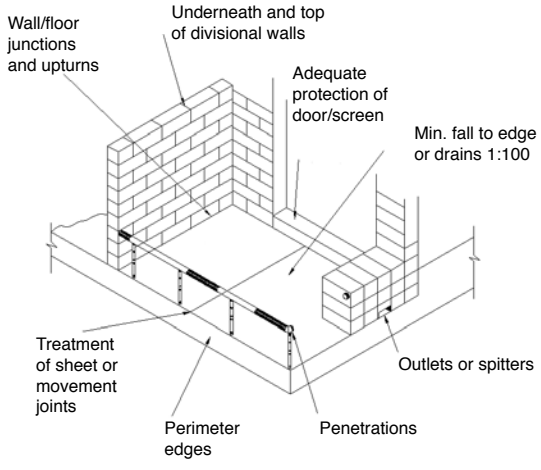


Fig.2 – Balcony – Critical areas



BALCONIES AND DECKS

1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
3. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
4. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
5. Apply the membrane as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
6. Where possible, apply the membrane prior to building divisional walls.
7. Apply the membrane to the entire balcony floor and at least 100mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
8. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
9. Apply the membrane down over the front edge of the balcony onto the drip rail.
10. Carefully seal any gaps around balcony penetrations with a neutral cure silicone prior to applying the membrane.
11. Apply the membrane down into outlets and drains, ensuring excess material is removed.
12. Ensure all weep holes are above the membrane application area.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm in 2 metre (wet areas) or 1:100 externally, must be achieved prior to tiling.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of ARDEX WPM 265 water based primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to completely dry prior to the application of the ARDEX WPM 001 membrane. This will take around 20–30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with ARDEX WPM 265 water based primer and allow to dry before applying two coats of ARDEX WPM 001 membrane in a band at least 200mm wide equidistantly across the crack and along the length of the crack.

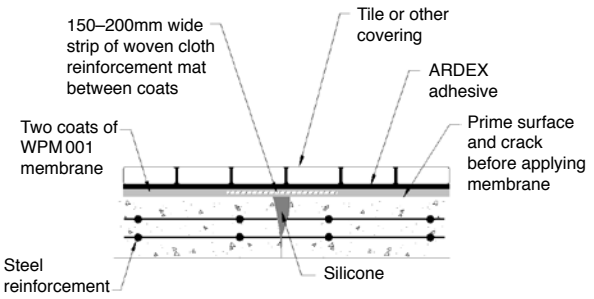
Cracks 2–6mm:

(Refer Fig.3) Prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth preferably using a fluted roller, and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

Contact your local ARDEX representative.

Fig.3 – Crack treatments



ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

MOVEMENT/CONSTRUCTION JOINTS

Movement joints (<6mm)

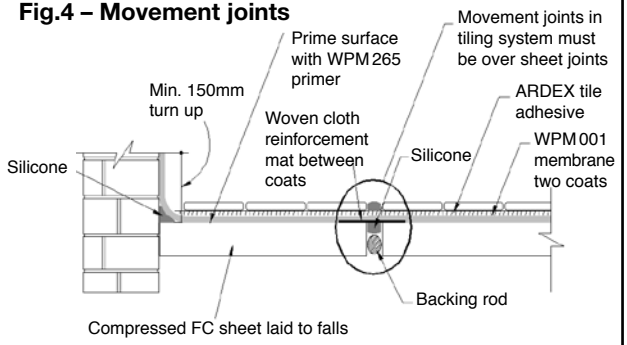
Use same procedure as in crack preparation.

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the mat and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of ARDEX Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)

Fig.4 – Movement joints



Corners and coving areas

After priming with ARDEX WPM 265 water based primer and allowing it to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates in coving areas and corners. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry.

Apply a first coat of ARDEX WPM 001 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be minimum of 1.0mm). Alternatively, if a reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry. Place a 190mm wide band of ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The ARDEX WPM 001 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of ARDEX WPM 001 to floors.

Walls

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply two coats of ARDEX WPM 001 (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheet joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 1.0mm. The flooring recommendations should be extended at least 150 mm up all perimeter walls.

Prime the surface with ARDEX WPM 265 water based primer and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1–2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone sealant. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

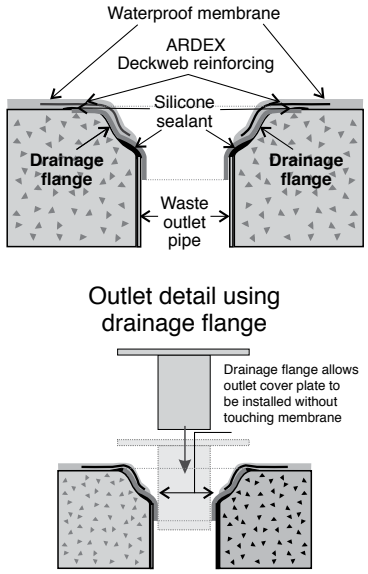
Waste outlet

Prime the surface with ARDEX WPM 265 water based primer and allow to dry. Surfaces of the outlet flange must be primed with an appropriate primer.

Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.

Apply ARDEX WPM 001 over the adjacent floor surface extending down into the waste outlet flange overlapping the edge of flange by at least 30 mm. Place ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig.5)

Fig.5 – Waste outlet



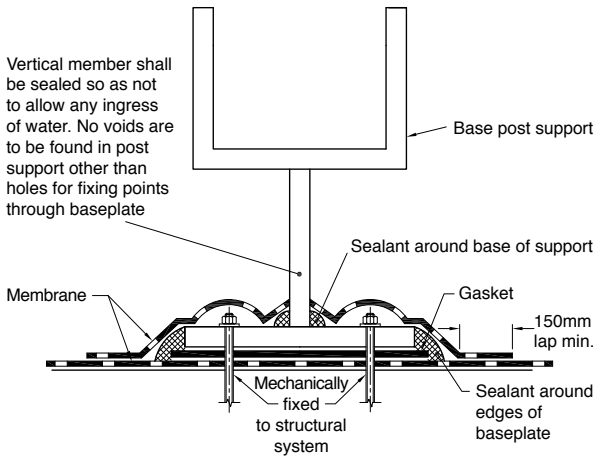
Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.

Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 12mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of ARDEX WPM 001 on the substrate and the flanged metal.

Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.0mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Fig.6 – Post membrane installation



Tiling systems

It is advisable to conduct a flood test of the waterproofed area once the membrane has cured (normally after 72 hours), and before the tiling commences. A broad range of ARDEX tile adhesives can be used over ARDEX membranes. Contact ARDEX or your nearest ARDEX stockist for advice on the most suitable system.

TECHNICAL DATA

ARDEX WPM 001 (Superflex Premixed)
Characteristics of liquid

Form and colour	Blue viscous paste
Type	Single part
Specific gravity	Approx. 1.3kg/litre
pH of liquid	8.5
Tensile strength 7 days dry AS1145	1.04 MPa
Full cure	1.92 MPa
Elongation at break 7 days dry AS1145	780%

Conforms to requirements of class 3 membrane of AS/NZ 4858: 2004 Wet Area Membranes.

VOC content	18g/L

NOTE: Most of the tests have been carried out in the ARDEX laboratory under standard conditions (23±2°C, 50±5% R.H).

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program.

Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations.

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

ARDEX Australia Pty Ltd

Technical Services Toll Free: 1800 224 070

New South Wales	Ph (02) 9851 9100	Fax (02) 9838 7970
Queensland	Ph (07) 3817 6000	Fax (07) 3881 3188
Victoria/Tasmania	Ph (03) 8339 3100	Fax (03) 9308 9332
South Australia	Ph (08) 8406 2500	Fax (08) 8345 3207
Western Australia	Ph (08) 9256 8600	Fax (08) 9455 1227

ARDEX New Zealand Ltd

Technical Services Toll Free: 0800 227 339

Auckland	Ph (09) 580 0005	Fax (09) 579 9963
Wellington	Ph (04) 568 5949	Fax (04) 568 6376
Christchurch	Ph (03) 373 6900	Fax (03) 384 9779

October 2010

Form 2A

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: **Lot 460 Hoffman Street**	
Suburb:	
Town/City **Christchurch**	Postcode:

THE OWNER

Name(s): **Lynley Bunn**	
Mailing address: **8 Havana Gardens**	
Suburb:	PO Box/Private Bag:
Town/City: **Christchurch**	Postcode:
Phone number: **0274901323**	Email address: **lyn390@gmail.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 **Andrew Siegenthaler** carried out in part 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**
Tick(√)*if included* *Cross (X) if excluded*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*
Primary structure			
All RBW Design work relating to B1 ( )		( ) Carried out ( ) Supervised	
Foundations and subfloor framing		Carried out in part ( ) Supervised	
Walls ✓	*Timber Framed Walls*	✓ Carried out in part ( ) Supervised	Floor Plan, Sections & Details
Roof ✓	*Timber Truss*	Carried out in part (✓) Supervised	Roof Plan & Truss Manufactures Design
Columns and beams		Carried out in part ( ) Supervised	
Bracing ✓	*Sheet Bracing*	✓ Carried out in part ( ) Supervised	Bracing Plan & Bracing Calcs
Other ( )		( ) Carried out ( ) Supervised	
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 ( )		( ) Carried out ( ) Supervised	
Damp proofing ✓	*DPM underside of slab & DPC under bottom plate*	✓ Carried out in part ( ) Supervised	Cross Section & Construction Details
Roof cladding or roof cladding system ✓	*Roof Cladding on Building Paper plus fixings*	✓ Carried out in part ( ) Supervised	Roof Plan & Construction Details
Ventilation system (for example, subfloor or cavity) ✓	*Mechanical Vents* *20mm Vavity System*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plans Cross Sections & Construction

			Details
Wall cladding or wall cladding system ✓	*Exterior Wall Claddings*	✓ Carried out in part ( ) Supervised	Elevations, Cross Sections & Construction Details
Waterproofing ✓	*Bath, Shower, WHB*	✓ Carried out in part ( ) Supervised	Details
Other ( )		( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ✓	*Smoke Alarms*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plan

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**
[List relevant clause numbers of building code]	*[Specify nature of waiver or modification of building code]*

Note: continue on another page if necessary.

ISSUED BY

Name: **Andrew Siegenthaler**	LBP or Registration number: **108550**
The practitioner is a: ✓ Design LBP ( ) Registered architect ( ) Chartered professional engineer	
Design Entity or Company (optional): **a.s.c.a.d. ltd**	
Mailing address (if different from below):	
Street address / Registered office: **59 Warwick Road**	

Suburb: **Ohoka**	Town/City: **Rangiora**
PO Box/Private Bag:	Postcode:
Phone number: **03 329 2092**	Mobile:
After Hours:	Fax:
Email address: **ascadltd@snap.net.nz**	Website:

DECLARATION

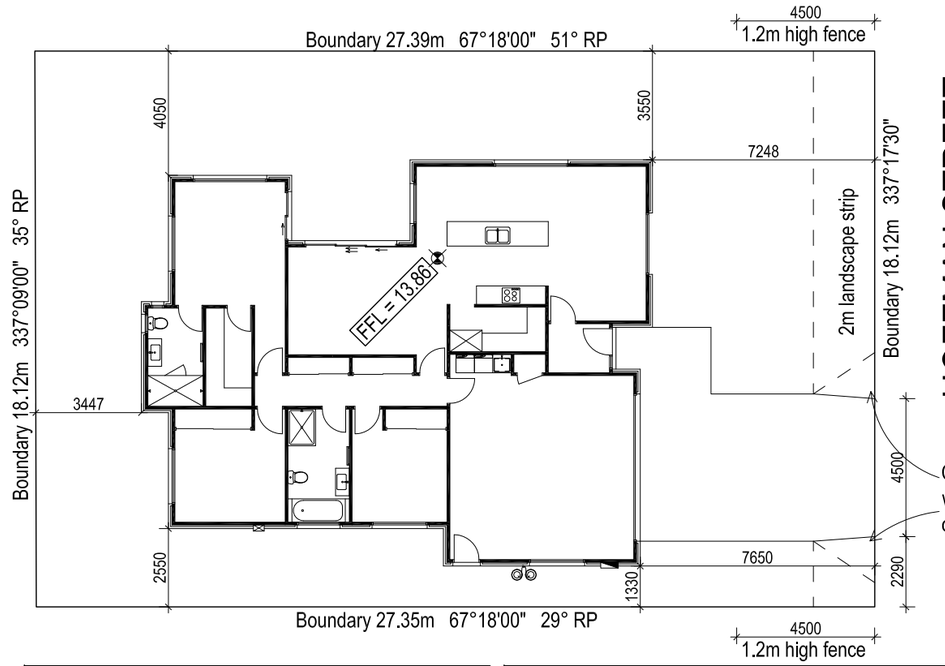
I **Andrew Siegenthaler** LBP **108550**

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; or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature: 

Date: **30/09/2020**



HOFFMAN STREET

N

Lot 460
DP 549008

Hoffman Street
Prestons Park
CHRISTCHURCH

Site Coverage:

184.7m² / 495.0m² = 37.3%

Clear Visibility above 1m for a width of at least 1.5m either side of the entrance for at least 2m

Care to be taken around street trees. Protect trees while construction in progress. All contractors to be made aware. Arborist (Treetech Specialist Treecare Ltd) to be engaged to over see earthworks within 5m of any street trees.

NZBC F5: All Construction work on the building shall be performed in a manner that avoids the likelihood of:
(a) Objects falling onto people on or off the site,
(b) Objects falling on property off the site,
(c) Other hazards arising on the site affecting people off the site and other property, and
(d) Unauthorised entry of children to hazards on the site

ALLOW FOR STEPS OR LANDSCAPING TO ALL EXTERNAL DOORS SO STEP FROM FFL NO GREATER THAN 190mm (100mm min)

Anti-slip: on all access routes both internal & external, provide Anti-slip surface complying with NZBC D1/AS Table 2 (except surfaces in side Entry Doors of housing maybe considered dry areas)

SITE SAFETY
Allow for and maintain
- 2m high galv chainlink netting fencing to street front
- where side fencing not in place use same 2m high fencing
- where water hazards are present use same 2m high fencing

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ascadltd@snap.net.nz
0272 838 775

job title:
BUNN HOUSE

drawing title:
SITE PLAN
15/10/20 REV A - Notes added

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
SUBJECT TO COUNCIL APPROVAL
ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK
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Job No.:
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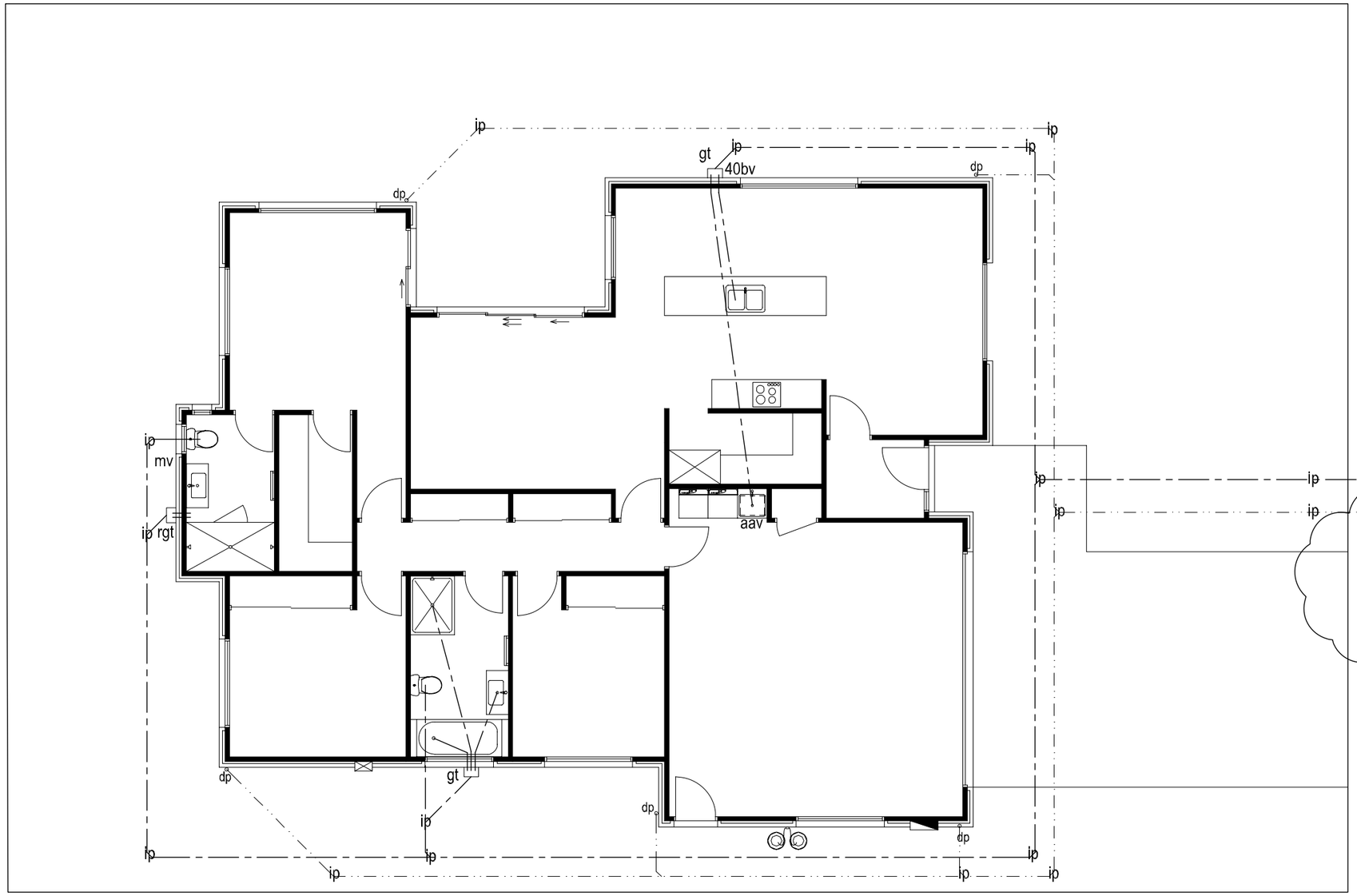
of: 22
DATE: 30/09/2020



SANITARY FIXTURE	FLOW RATE/TEMP	PIPE DIAMETER
Bath	0.3 at 45°C	15mm
Sink	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Laundry Tub	0.2 at 60°C (hot)	15mm
	0.2 (cold)	15mm
Basin	0.1 at 45°C	10mm
Shower	0.1 at 42°C	20mm

PIPE DIAMETER	MAXIMUM DISTANCE BETWEEN SUPPORTS (mm)	
	VERTICAL PIPE	GRADED PIPE
32 to 50	1000	500
65 to 100	1200	1000
Greater than 100	1800	1200

All drains laid at 1:120 to be laid with a verifiable leveling device

Relief GT - top of GT to be 150mm below overflow level of lowest sanitary fixture. FGL around Relief GT to be no higher than 13.61 (13.68 if paved)	13.86 = FFL - 0.15 = Shower Recess to Top GT - 0.10 = Top GT to FGL 13.61 = FGL

All pipes in Concrete to have Denso Tape (synthetic fabric based tape impregnated and coated with organic petroleum based compounds) applied

Pipes shall incorporate expansion joints in accordance with Chapter 8 of NZS7643

Hot water pipes to be sized according to NZBC G12 & NZS 4305. Mains Pressure: 15mm dia allows 12m max pipe length. Pipe length beyond this must be lagged

SANITARY FIXTURE	MIN PIPE DIA	MIN GRADE
Basin	32mm	1:20
Bath	40mm	1:40
Washing Machine	40mm	1:40
Kitchen Sink / Dish Washer	50mm	1:40
Laundry Sink	40mm	1:30
Shower	40mm	1:40
WC	100mm	1:60
SEWER PIPE	100mm	1:60
STORMWATER PIPE	100mm	1:120

Main Vent (MV) to terminate either:
- 3.0m above ground level
- 600mm above windows / openings
- 150mm above roof
- 600mm above eaves / parapets

HWC Relief Drain = 20mm Copper Pipe

VENT PIPES:
Discharge Pipes upto 40mm dia = 32mm Vent Pipe
Discharge Pipes over 40mm dia = 40mm Vent Pipe
Main Drain Vent Pipe = 80mm Vent Pipe

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ascadltd@snap.net.nz
0272 838 775

job title:
BUNN HOUSE

drawing title:
SERVICES PLAN
28/10/20 REV B - Notes added

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
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scale: 1:100
Job No.: -

page: 02b of: 22
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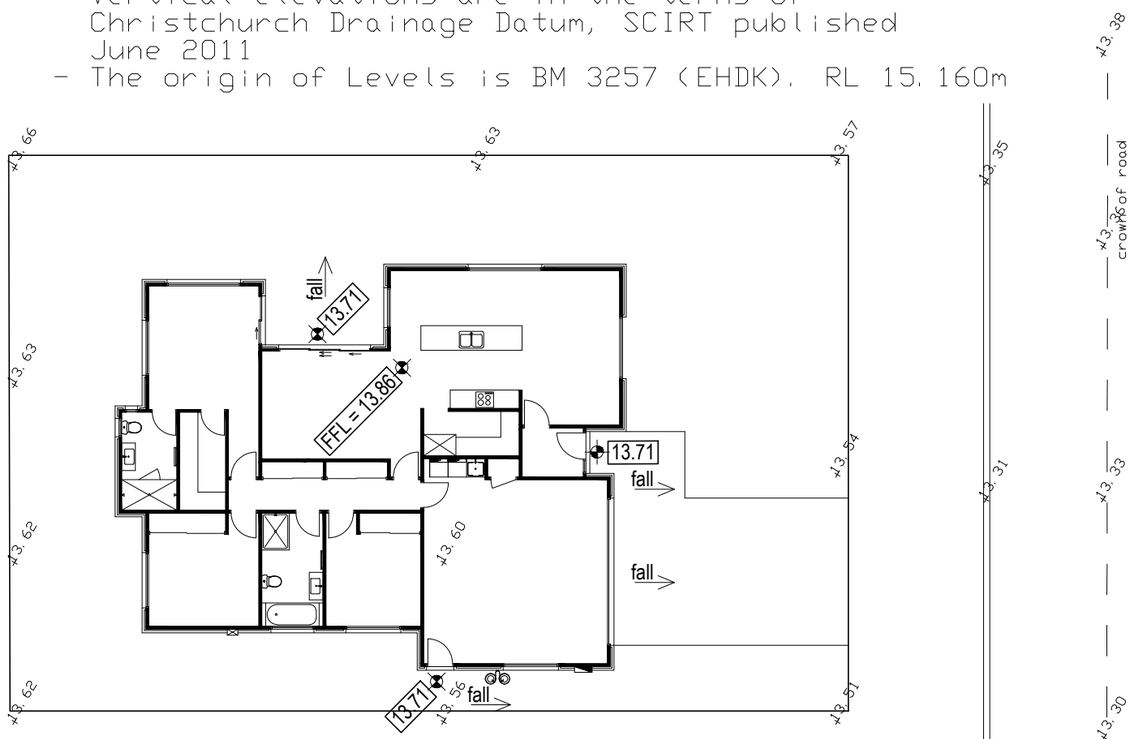
SURVEY ORIGIN DATA
- The property data has been sourced from Aurecon (May 2019) and is subject to final legal review by Land Information NZ (LINZ)
- Vertical elevations are in the terms of Christchurch Drainage Datum, SCIRT published June 2011
- The origin of Levels is BM 3257 (EHDK). RL 15.160m



CLEARANCES:
FFL to Ground = 200mm min (Brick)
FFL to Ground = 225mm min (WB)

Fall Ground away from building at 1:30 for atleast 1m

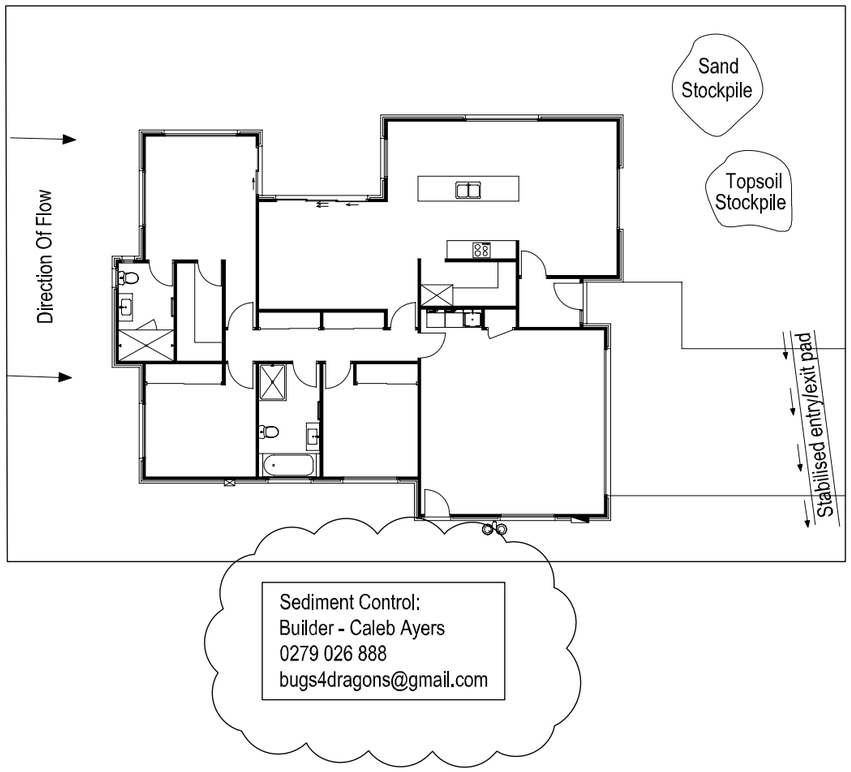
FFL to Paving = 150mm min
Fall Paving away from building

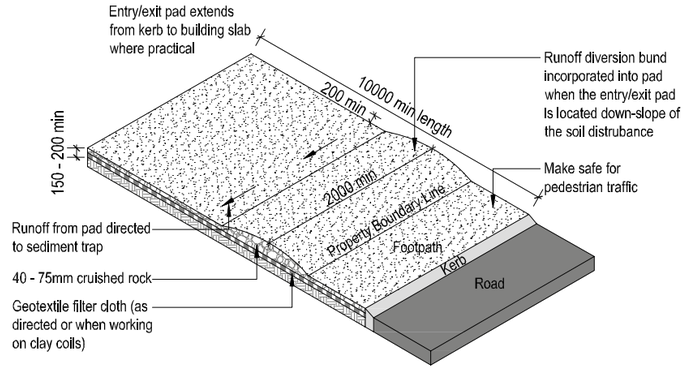
FALL DRIVE & PATHS AT 1:100 Min

10.62 = Proposed levels
+10.59 = Existing levels

Fall Drive towards Gardens & Grassed areas as much as possible for water run off

a.s.c.a.d. limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: SITE LEVELS PLAN	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:200 Job No.: -	page: 03 of: 22 DATE: 30/09/2020





STABILISED ENTRY/EXIT PAD

Remove Stablisied Entry/Exit Pad apon completion of the formed driveway

Notes:

1. All erosion and sediment control structures to be inspected each working day and maintained in good working order

2. All ground cover vegetation outside the immediate building area to be preserved during the building phase

3. All erosion and sediment control measures to be installed prior to commencement of major earthworks

4. Stockpiles of clay materials to be covered with impervious sheet

5. Roof water downpipes to be connected to the permanent underground stormwater system as soon as practical after roof is laid

Grassed Kerb to street - where possible make sure grass remains intact or replace as soon as possible

Temperary Sediment Control Fence to Street Boundary

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0272 838 775

job title:
BUNN HOUSE

drawing title:
SEDIMENT CONTROL PLAN
28/10/20 REV B - Notes added

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
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Type 1 Smoke alarm to comply with NZBC clause F7, with Hush & Test facilities

All Lintels SG8 unless otherwise stated

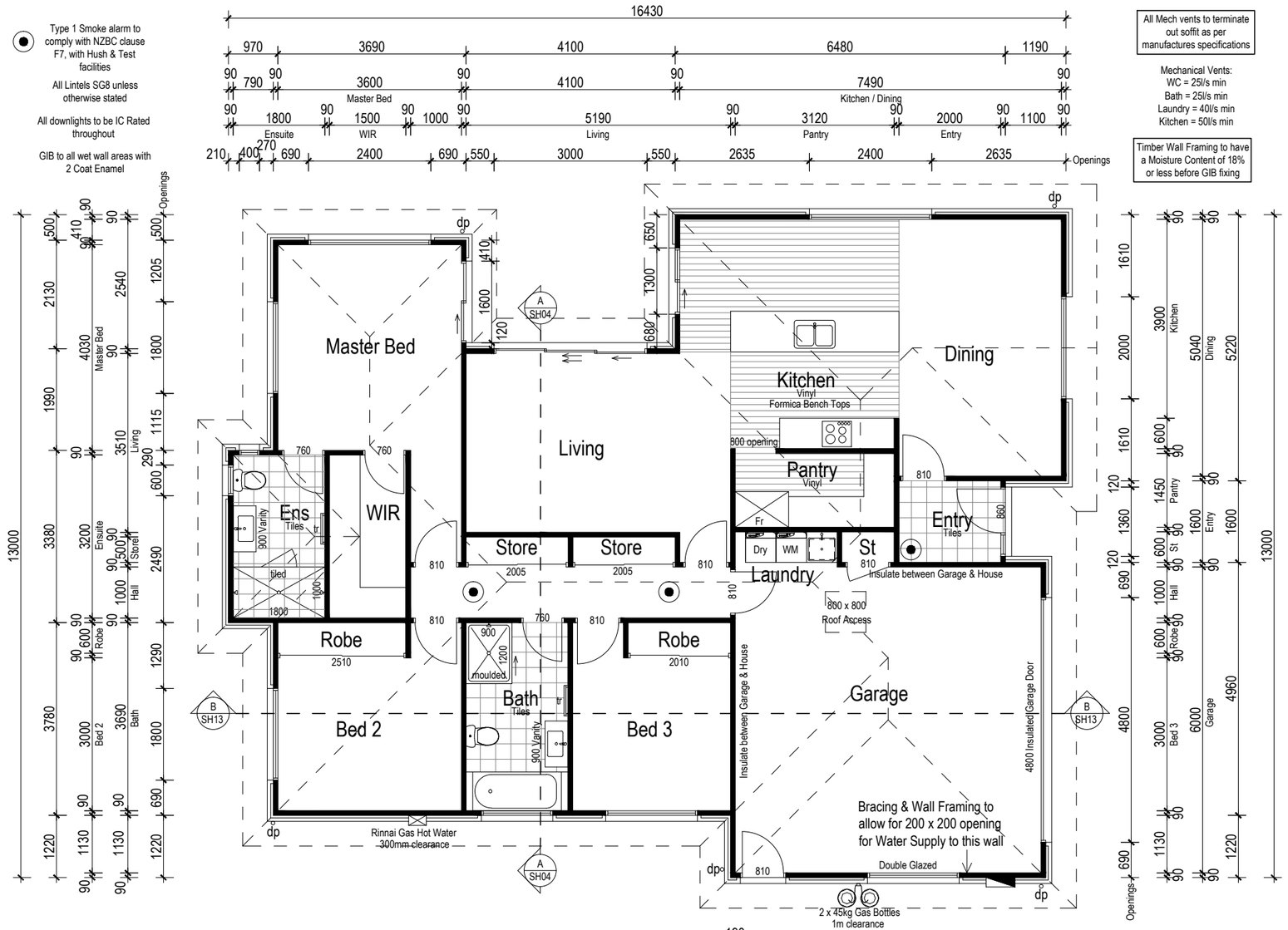
All downlights to be IC Rated throughout

GIB to all wet wall areas with 2 Coat Enamel

All Mech vents to terminate out soffit as per manufactures specifications

Mechanical Vents:
WC = 25l/s min
Bath = 25l/s min
Laundry = 40l/s min
Kitchen = 50l/s min

Timber Wall Framing to have a Moisture Content of 18% or less before GIB fixing



SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
INTERNAL WALLS
Light & Heavy Roof
Wind Zone = All

Loaded Dimension of Wall	Stud Size for Max Height of:			
	3.0m @ 600crs	3.6m @ 600crs	4.2m @ 400crs	4.8m @ 400crs
2.0	90 x 45	90 x 70	90 x 90	140 x 45
4.0	90 x 45	90 x 70	90 x 90	140 x 45
6.0	90 x 45	90 x 70	90 x 90	140 x 45

Note: Dwangs @ 800crs max

184.7m² OVER FOUNDATION

SINGLE OR TOP STOREY
SG8 STUDS TO LOAD BEARING WALLS
Light & Heavy Roof
Wind Zone = High

Loaded Dimension of Wall	Stud Size for Max Height of:					
	2.4m @ 600crs	2.7m @ 400crs	3.0m @ 300crs	3.6m @ 300crs	4.2m @ 300crs	4.8m @ 400crs
2.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
4.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90
6.0	90 x 45	90 x 45	90 x 45	90 x 90	140 x 45	140 x 90

Note: Dwangs @ 800crs max

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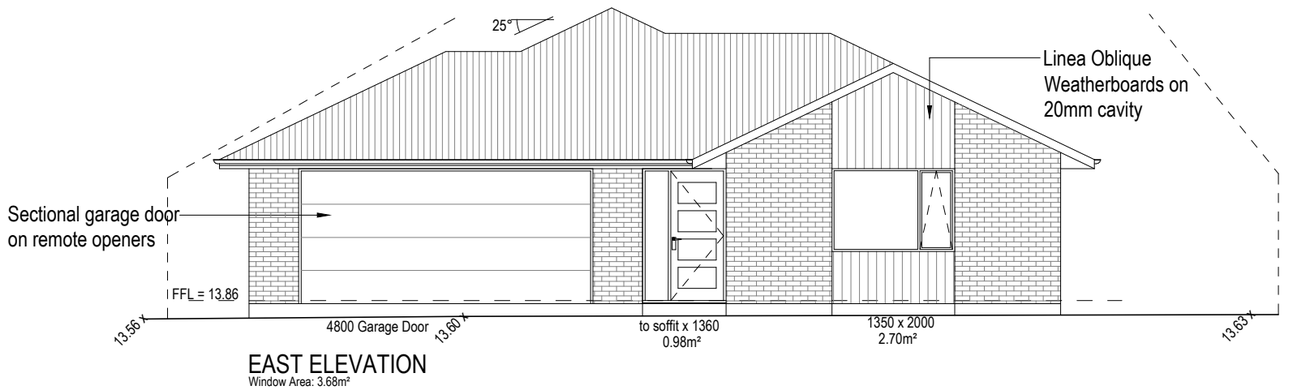
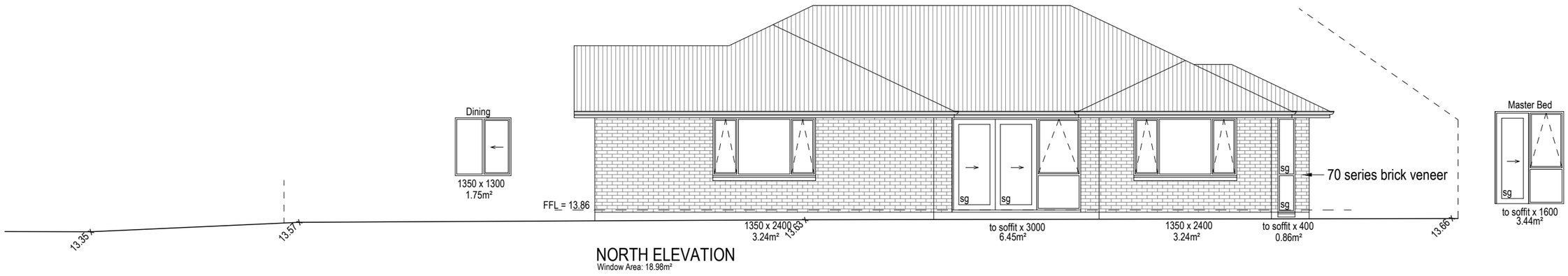


EAST ELEVATION
Window Area: 3.68m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



NORTH ELEVATION
Window Area: 18.98m²

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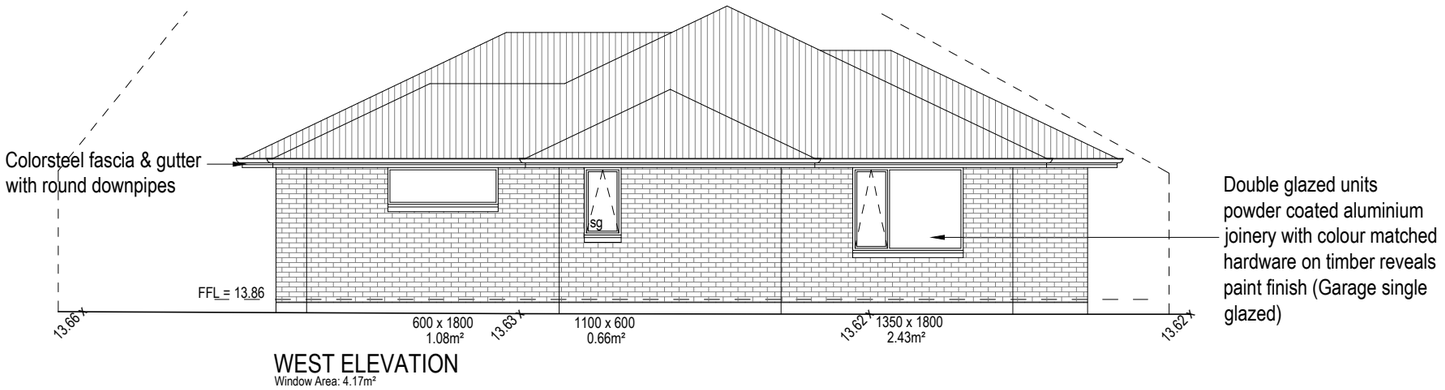
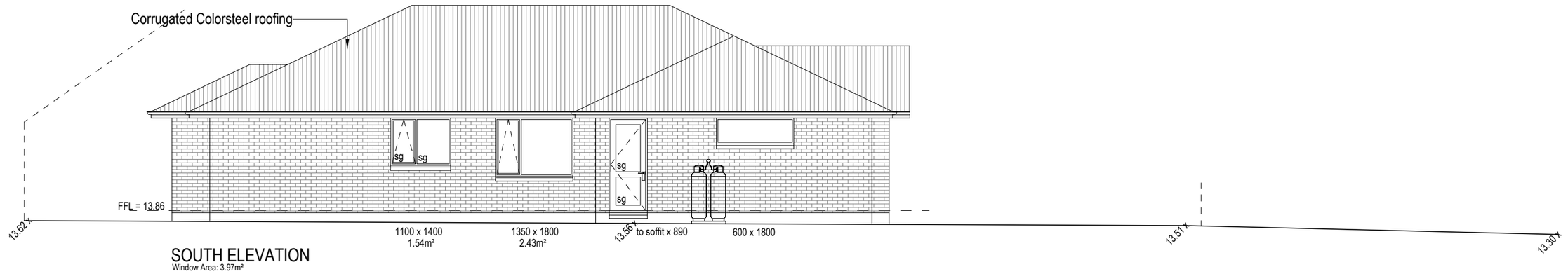


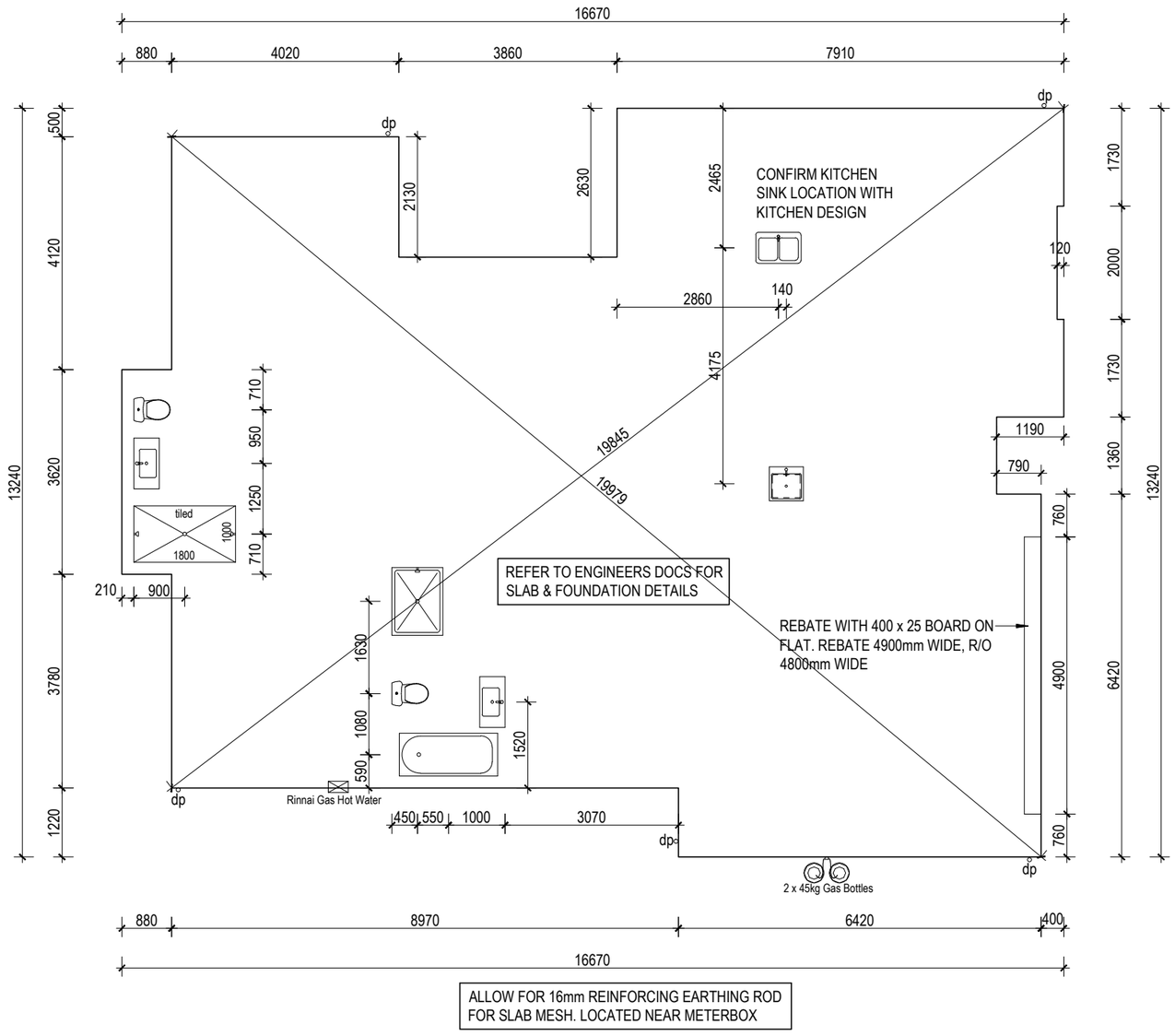
WEST ELEVATION
Window Area: 4.17m²

- "A Grade" safety glass to NZS4223 - Part 1 - 4 (sg)
- WANZ support bar to all doors & windows
- 85mm Brick ties to be Hot Dip Galvanised at 600crs Horizontal & 350crs Vertical max, screw fixed with Hot Dip Glav 35mm x 12g Type 17 Hex Head Screws. Ties to be positioned in 2 rows immediately above a DPC
- Tyvek Straps horizontally 300mm crs max to prevent insulation bulging



SOUTH ELEVATION
Window Area: 3.97m²

a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: ELEVATIONS	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:100 Job No.: -	page: 07 of: 22 DATE: 30/09/2020



a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: FOUNDATION PLAN	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:100 Job No.: -	page: 08 of: 22 DATE: 30/09/2020

BRACED WALLS - Extend top plate and or ceiling battens or bottom cord of truss to connect with external walls

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BUNN HOUSE

drawing title:
BRACING PLAN

legal description:
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Hoffman Street
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scale: 1:100
Job No.: -

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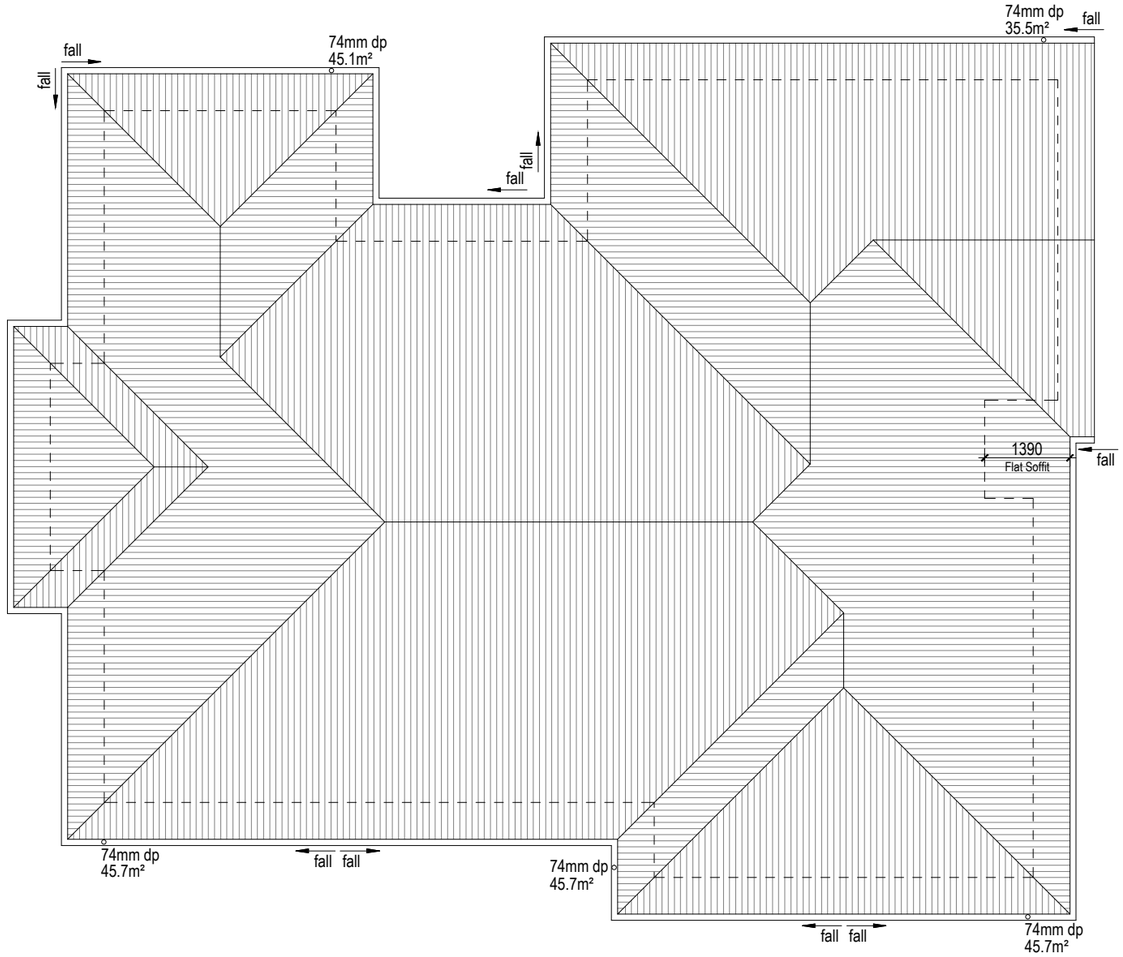

25° PITCH CORRUGATED COLORSTEEL ROOFING
600mm OVERHANG UNLESS OTHERWISE STATED

REFER TO TRUSS DESIGN DOCUMENTATION FOR ROOF PLANE BRACING DETAILS

USE DIAMOND QUAD WITH 6300mm² CROSS SECTIONAL AREA

USE 90 x 45 @ 900crs ON EDGE HORIZONTALLY SUPPORTING SOFFIT LININGS TO SOFFITS OVER 750mm WIDE

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drawing title:
ROOF PLAN

legal description:
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0272 838 775

job title:
BUNN HOUSE

drawing title:
ELECTRICAL PLAN

legal description:
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Hoffman Street
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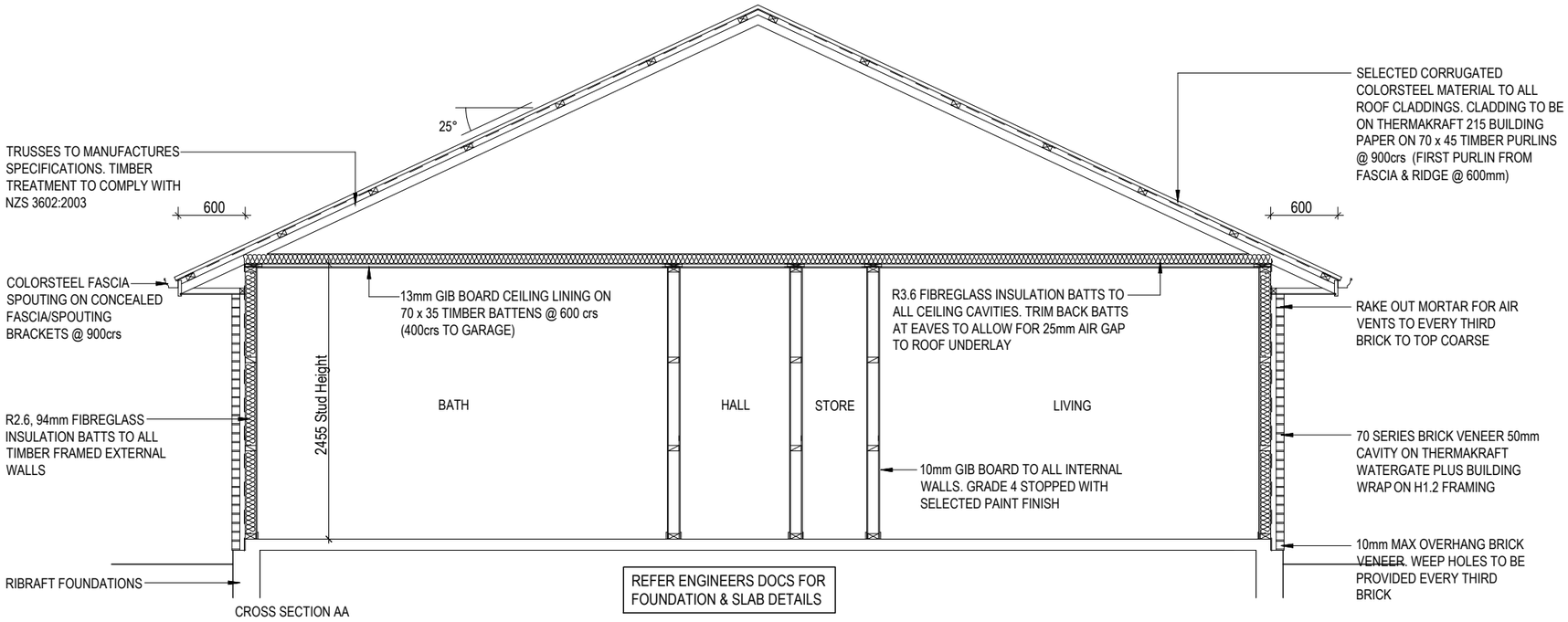

SPECIFIC SCHEDULE OF TIMBER TREATMENT

ELEMENT	SPECIES	TREATMENT
ROOF FRAMING, TRUSSES	KILN DRIED & GAUGED RADIATA PINE	H1.2
INTERIOR WALL FRAMING	KILN DRIED & GAUGED PINUS SPECIES	H1.2
EXTERIOR WALL FRAMING (REFER TO NZS3602:2003 FOR CLARIFICATION)	RADIATA PINE	H1.2
WALL CAVITY BATTENS	RADIATA PINE	H3.1
ALUMINIUM WINDOW REVEALS	RADIATA PINE	H3.1

ELEMENT

- ALL TIMBER USED IS TO BE TREATED AS REQUIRED BY NZS3602:2003, THIS TABLE IS INTENDED AS A SUMMARY OF THESE REQUIREMENTS ONLY.

- TREATMENT LEVELS SHOWN ARE THE MINIMUM LEVEL REQUIRED. HIGHER TREATMENT LEVELS MAY BE USED IF APPROPRIATE.

TIMBER TYPE:
EXTERIOR & LOAD BEARING FRAMING = SG 8
INTERIOR NON LOAD BEARING FRAMING = SG 8
LINTELS = SG 8
TRUSSES = SG 8

TRIMMED INSULATION AREA (90mm rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33	2.1

STEEL PROTECTION FOR FIXINGS & FASTENINGS - ZONE B & C

FIXING FASTENING	ENVIRONMENT	MATERIAL
Nail Plates	Closed & Roof Space	Continuously coated galv steel
Wire Dogs & Bolts	Closed & Roof Space	Hot-dipped galv steel
All strutural fixings	Sheltered	Hot-dipped galv steel
	Exposed	Type 304 stainless steel
Nail/Screw for bracing		Galv steel
Nail/Screw for non-structural cladding		Galv steel
Nail/Screw for framing	Closed & Roof Space	Mild steel
	Sheltered	Galv steel
	Exposed	Galv steel

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drawing title: SECTION AA

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scale: 1:50
Job No.: -

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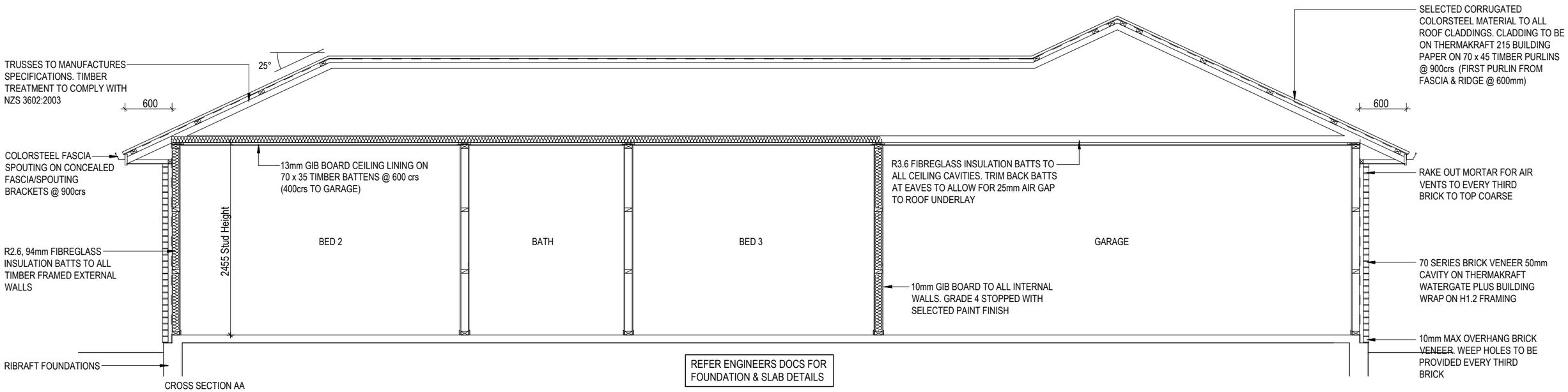
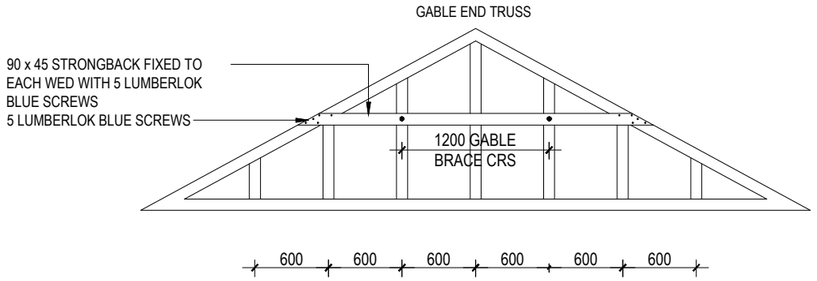
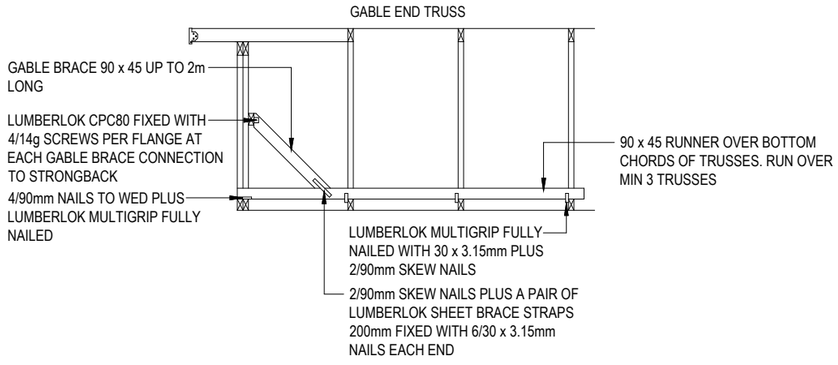


CROSS SECTION AA





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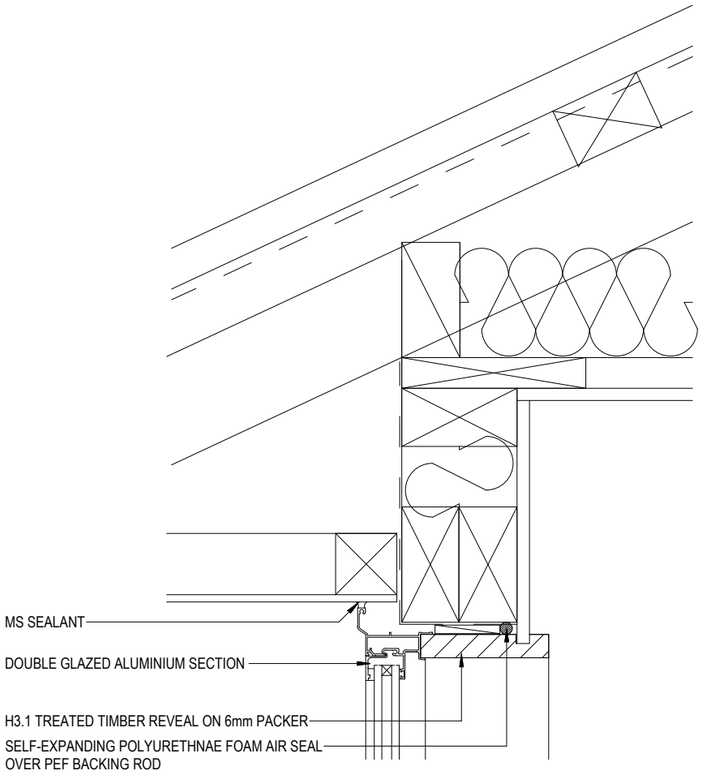
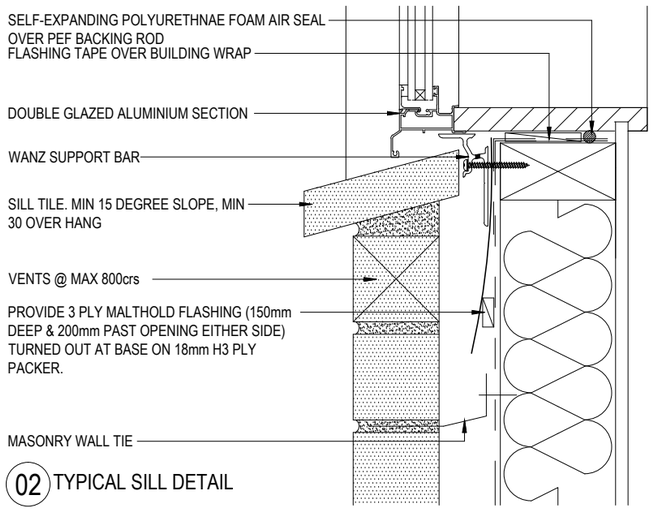
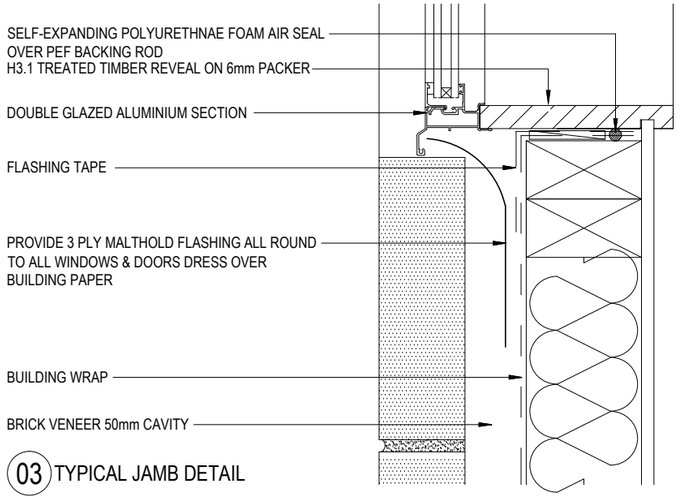


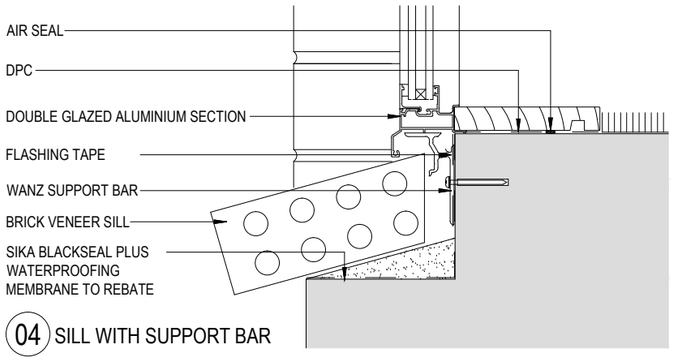
01 TYPICAL HEAD DETAIL



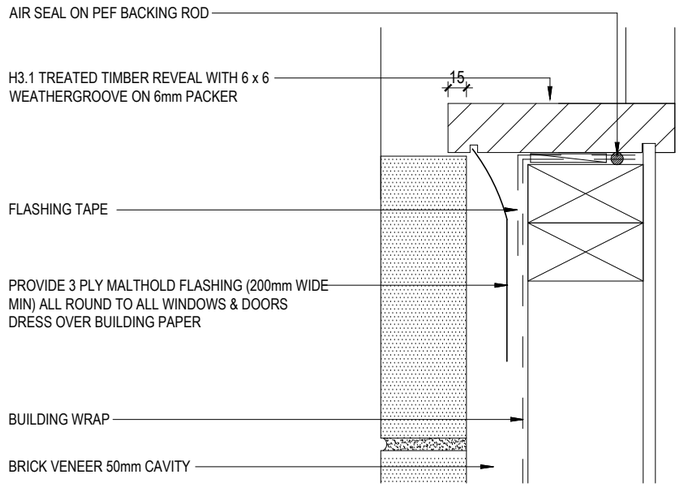
02 TYPICAL SILL DETAIL



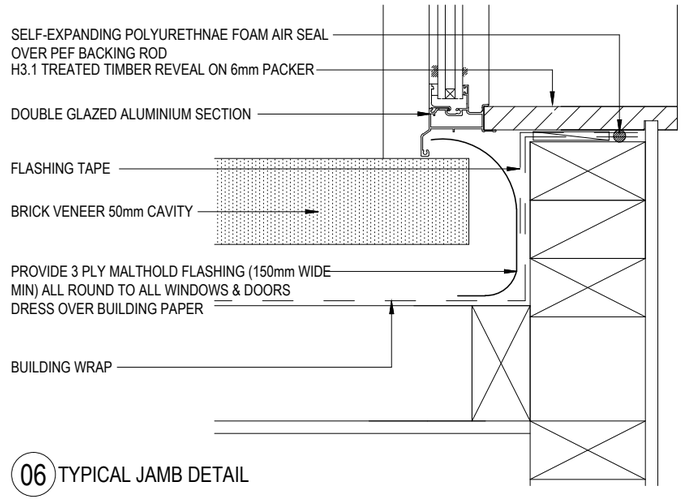
03 TYPICAL JAMB DETAIL



04 SILL WITH SUPPORT BAR



05 TYPICAL GARAGE DOOR JAMB



06 TYPICAL JAMB DETAIL

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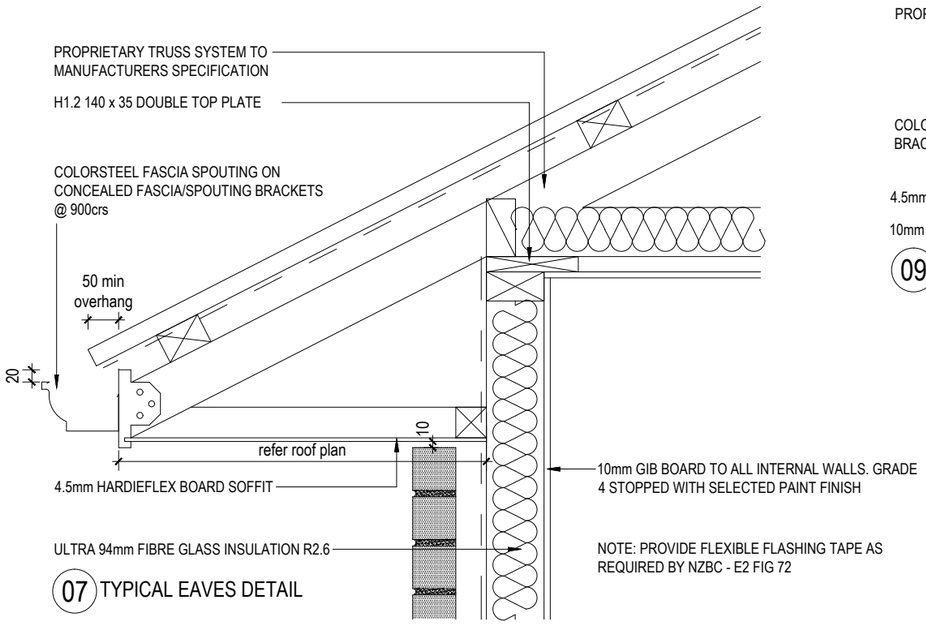
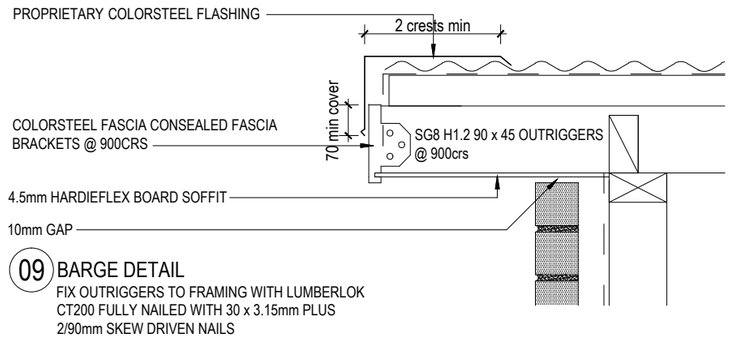
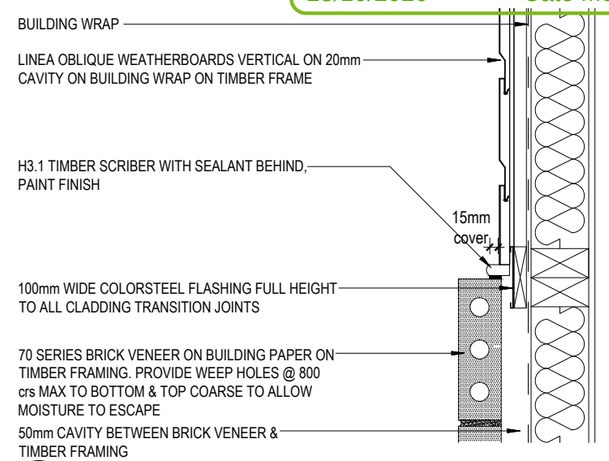


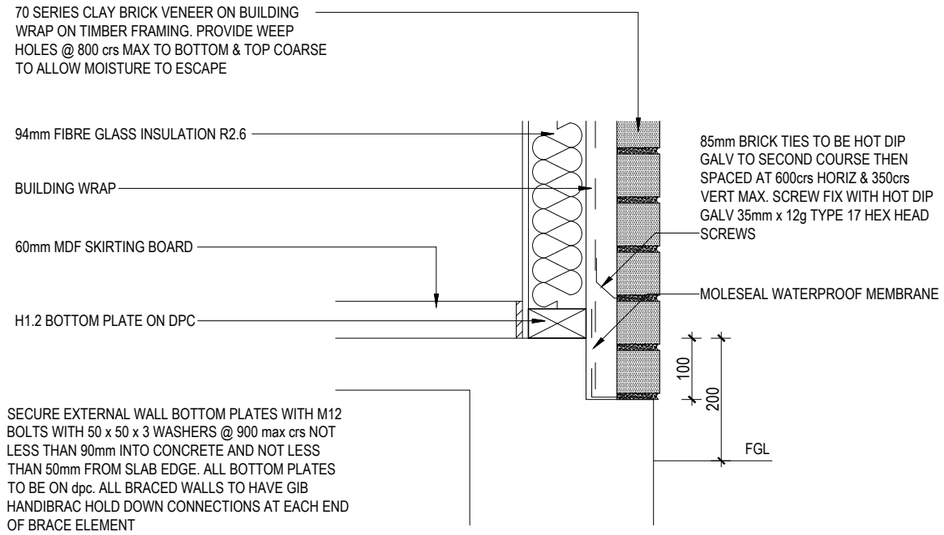
07 TYPICAL EAVES DETAIL



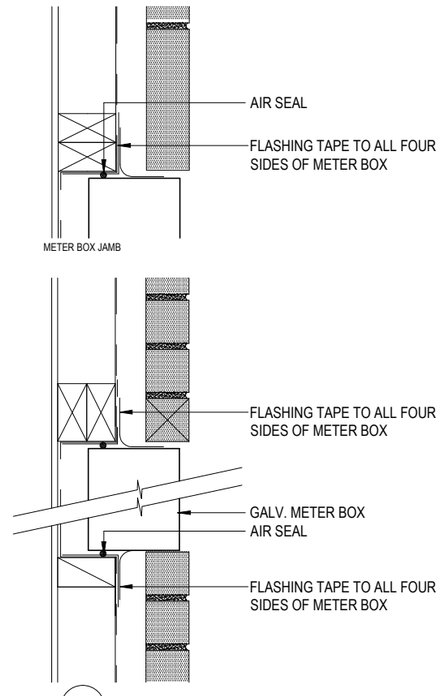
09 BARGE DETAIL
FIX OUTRIGGERS TO FRAMING WITH LUMBERLOK CT200 FULLY NAILED WITH 30 x 3.15mm PLUS 2/90mm SKEW DRIVEN NAILS



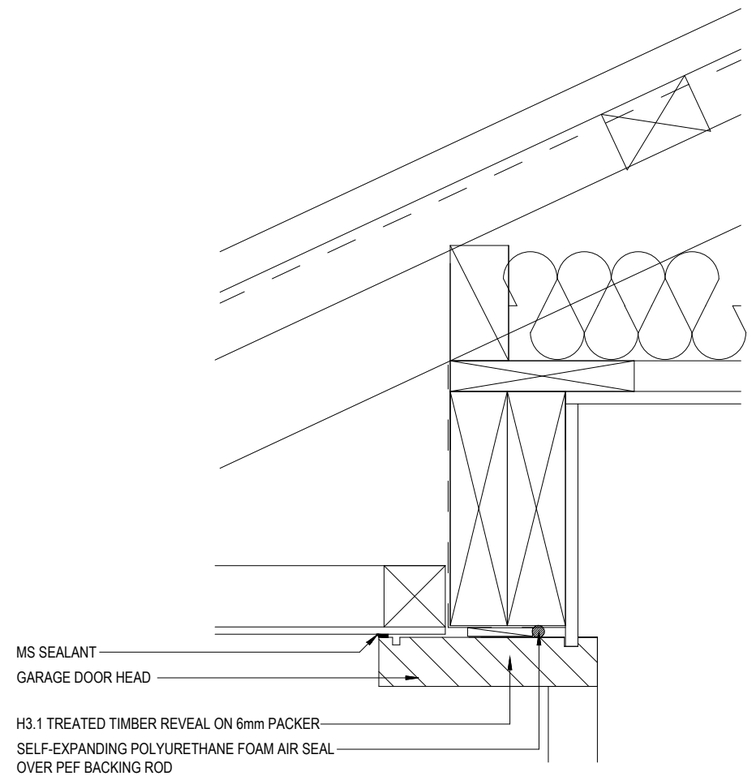
11 WB TO BRICK VENEER CLADDING TRANSITION DETAIL



08 FOUNDATION DETAIL



10 BRICK / METER BOX DETAIL



12 GARAGE HEAD DETAIL

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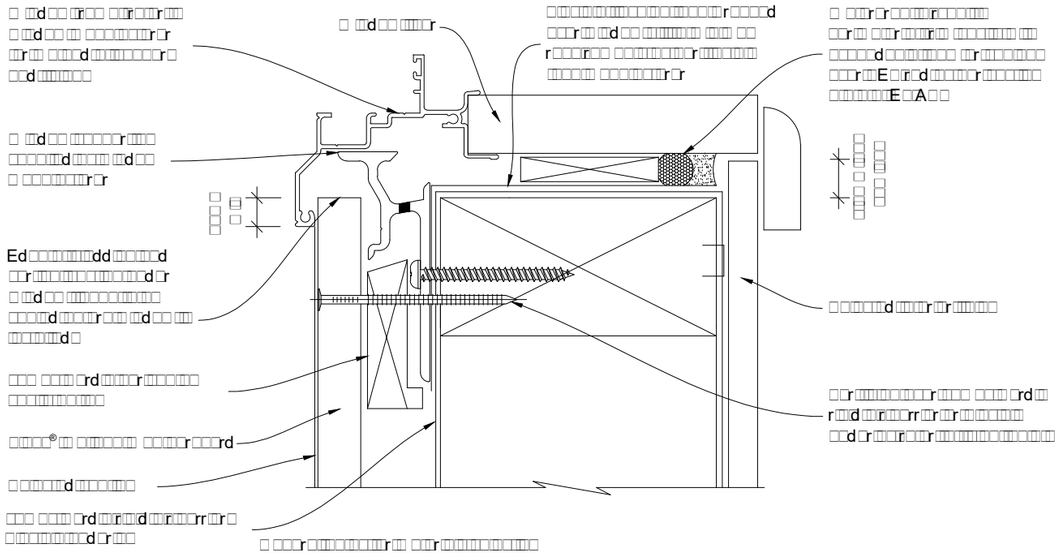

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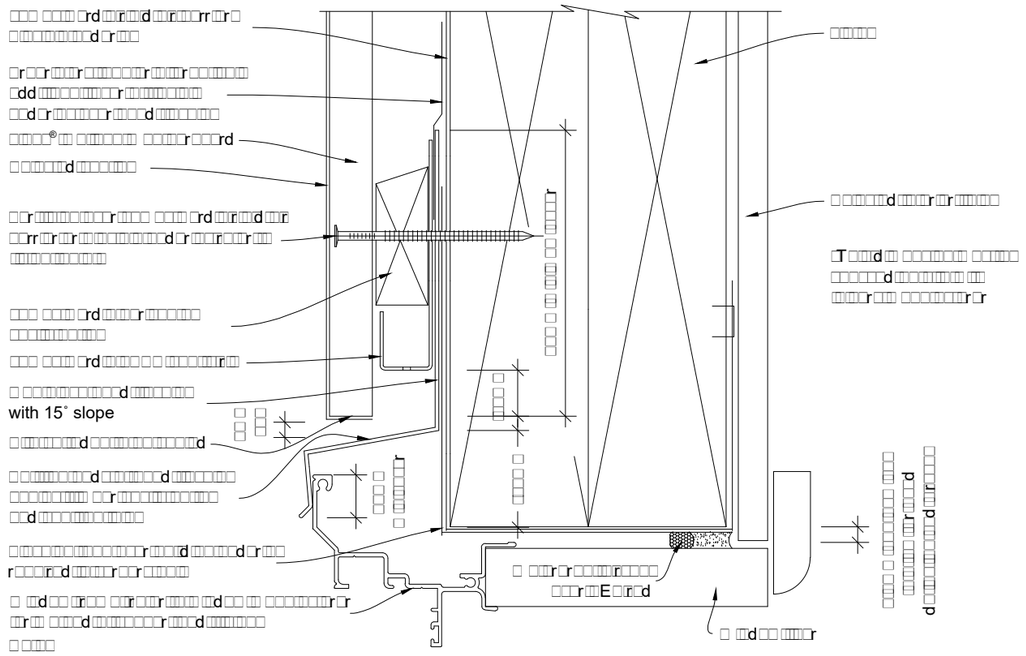

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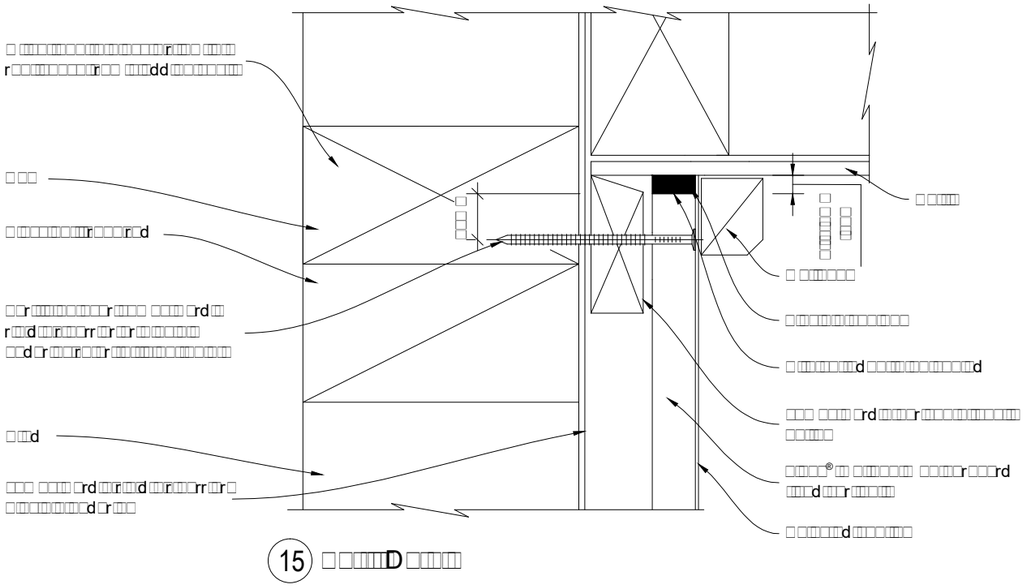

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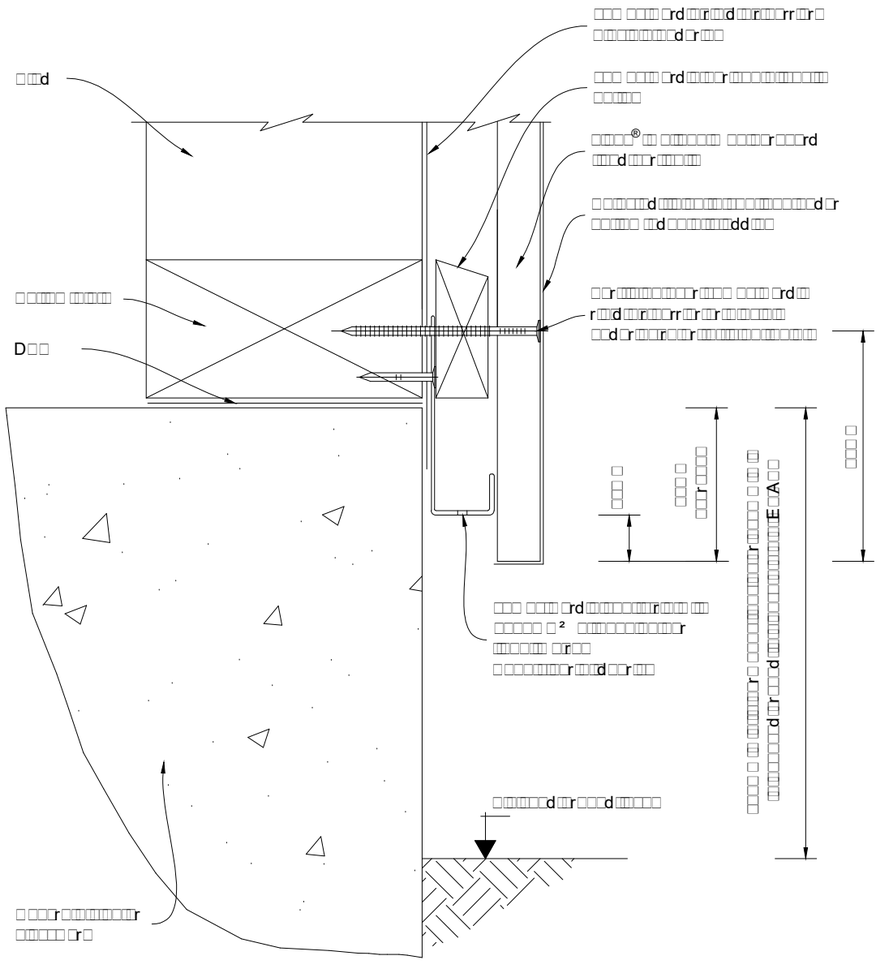

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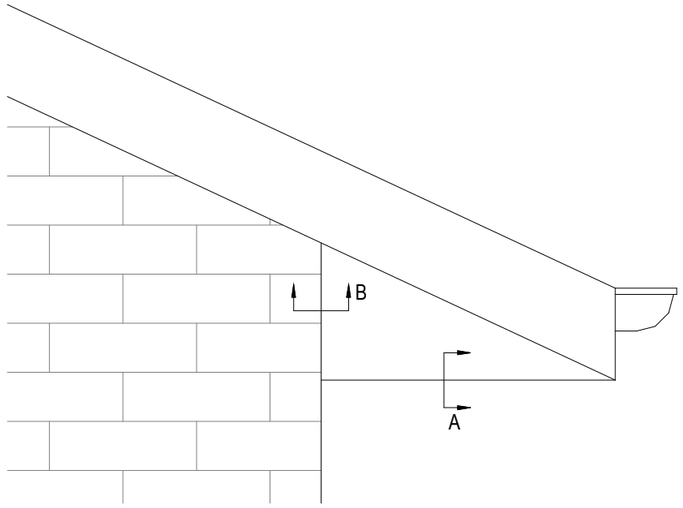
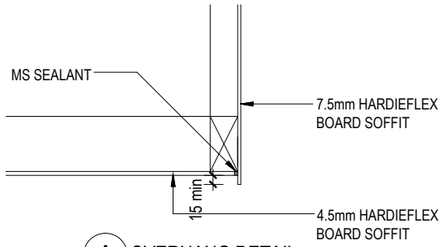
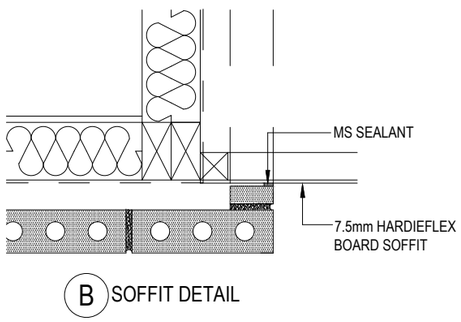


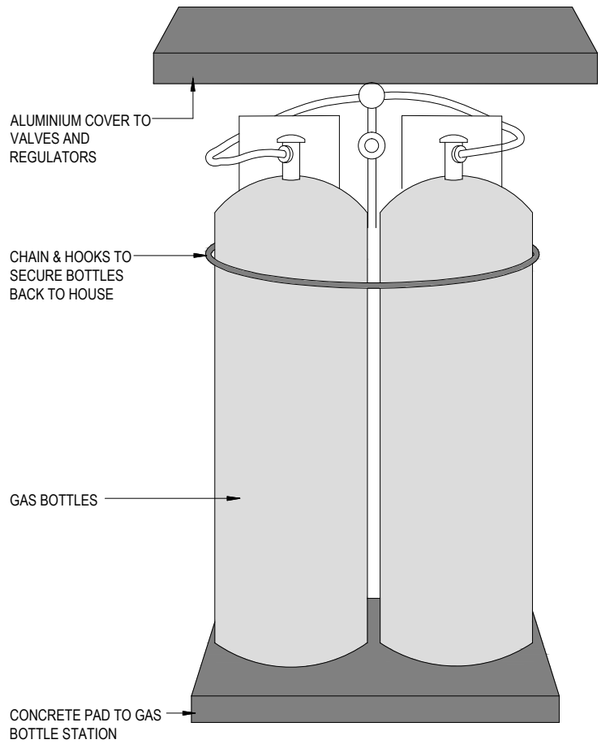
17 EAVES DETAIL



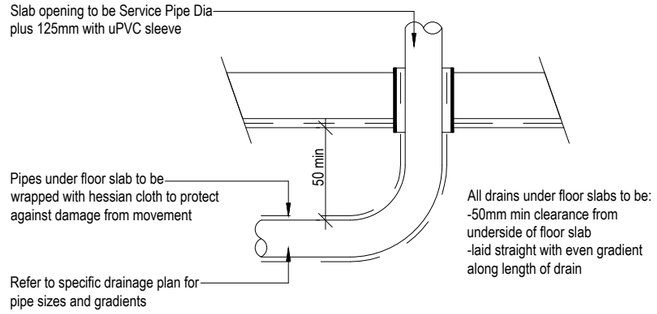
A OVERHANG DETAIL



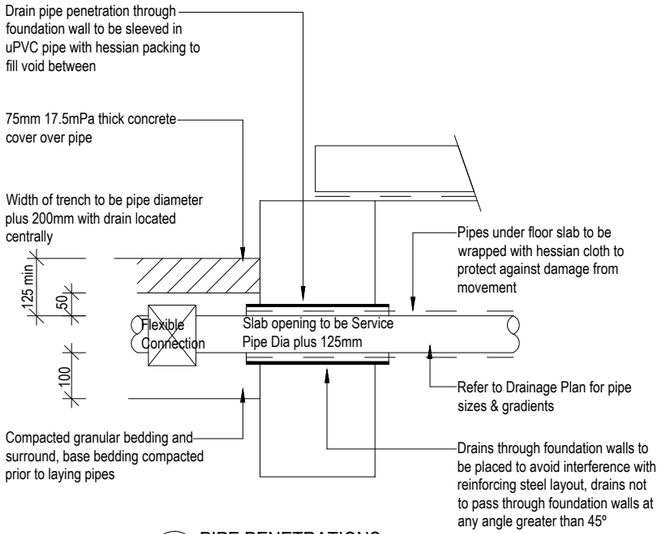
B SOFFIT DETAIL



18 GAS BOTTLES STATION



19 PIPE THROUGH FLOOR SLAB PENETRATIONS



20 PIPE PENETRATIONS THROUGH FOUNDATION WALLS
DETAIL APPLICABLE TO PIPES WITH A MINIMUM COVER OF 125mm UP TO A MAXIMUM OF 375mm

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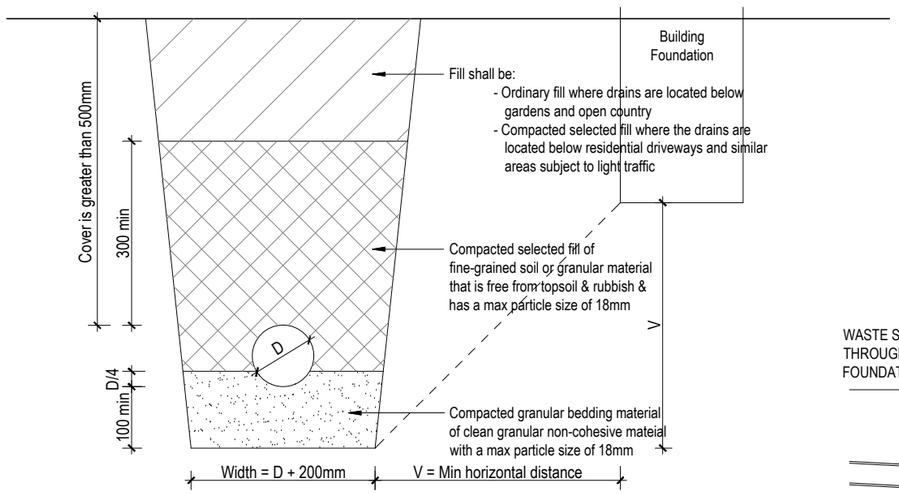
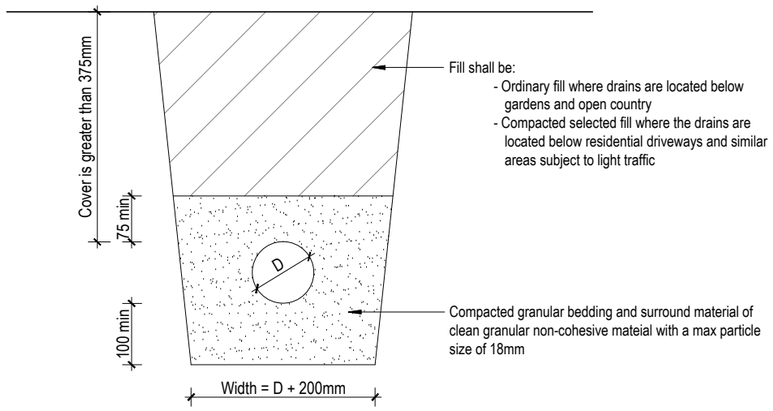
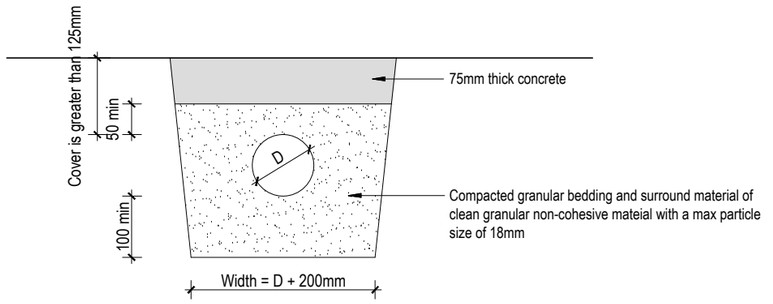


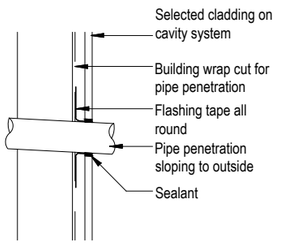
21 BEDDING TYPE 'B' OF NZS7643
Cover greater than 500mm



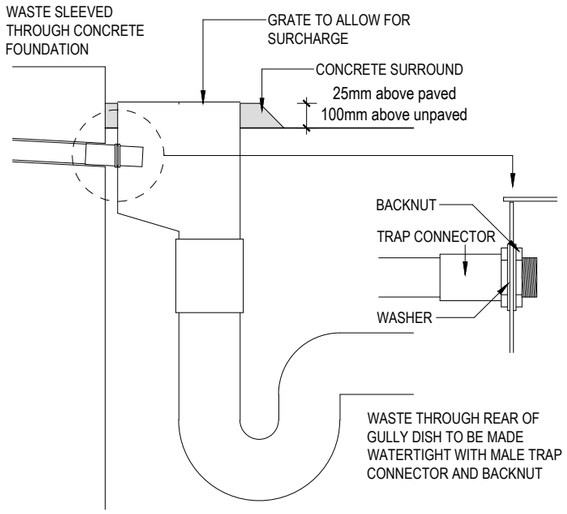
22 BEDDING TYPE 'D' OF NZS7643
Cover greater than 375mm



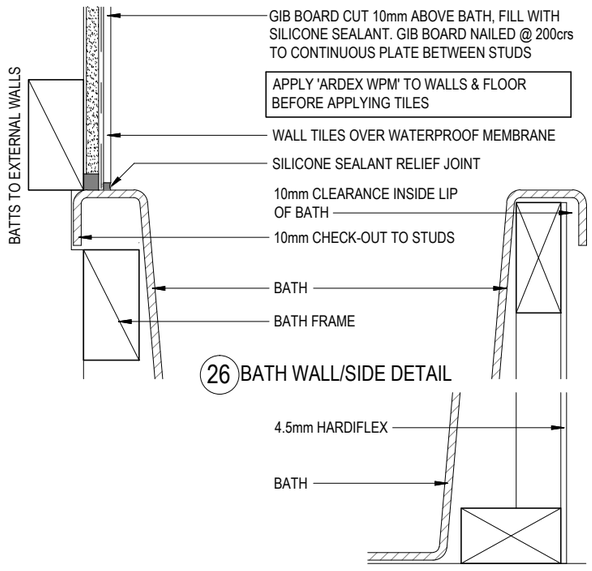
23 COVER BETWEEN 125 & 375mm



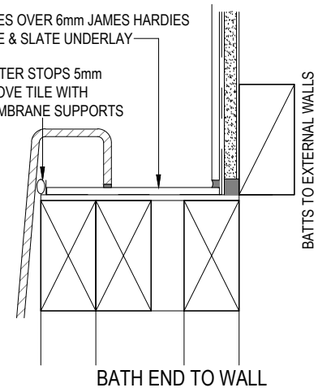
24 GENERAL PIPE PENETRATION



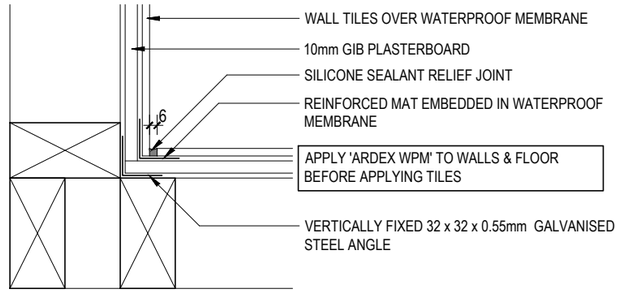
25 WASTE DISCHARGING TO REAR OF GT



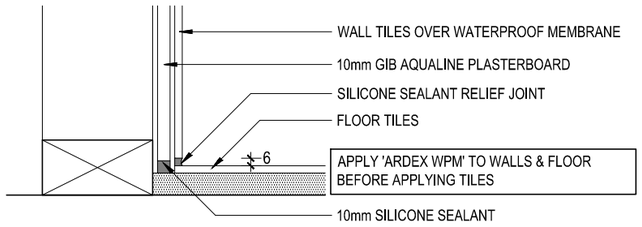
26 BATH WALL/SIDE DETAIL



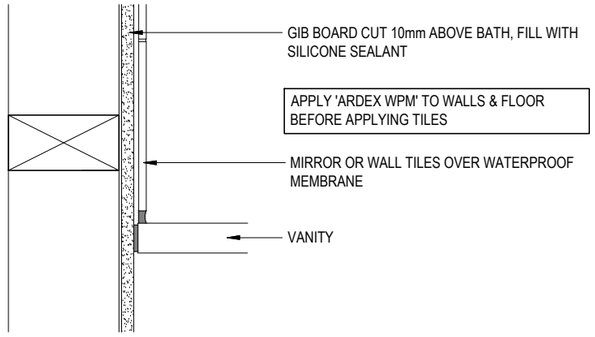
BATH END TO WALL



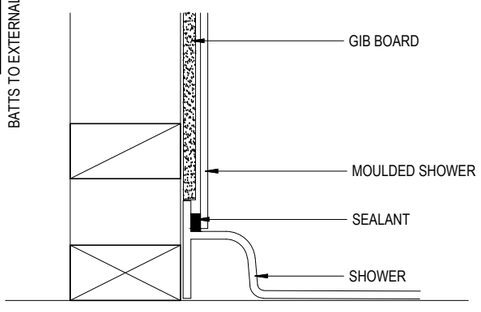
27 TILED - INTERNAL CORNER



28 TILED - WALL TO FLOOR JUNCTION



29 VANITY TO WET WALL DETAIL



30 WALL TO SHOWER JUNCTION

a . s . c . a . d .
limited
ascadltd@snap.net.nz
0272 838 775

job title:
BUNN HOUSE

drawing title:
DETAILS

legal description:
Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS
SUBJECT TO COUNCIL APPROVAL
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scale: 1:10
Job No.: -

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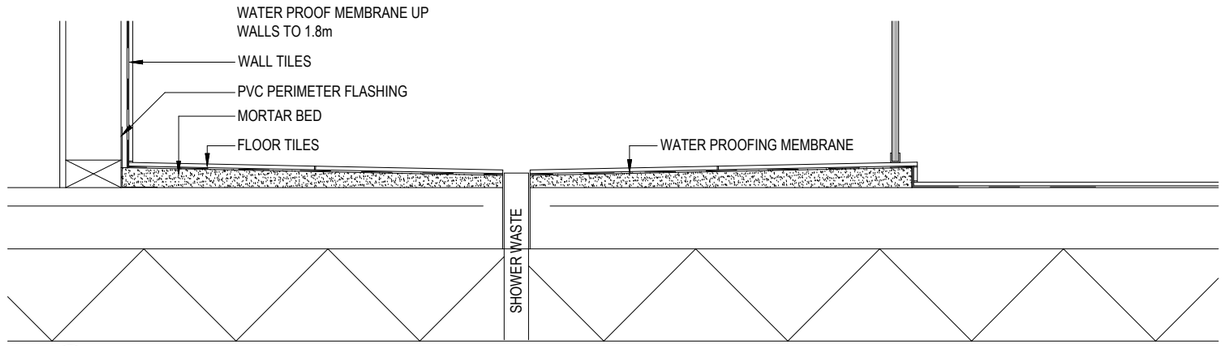
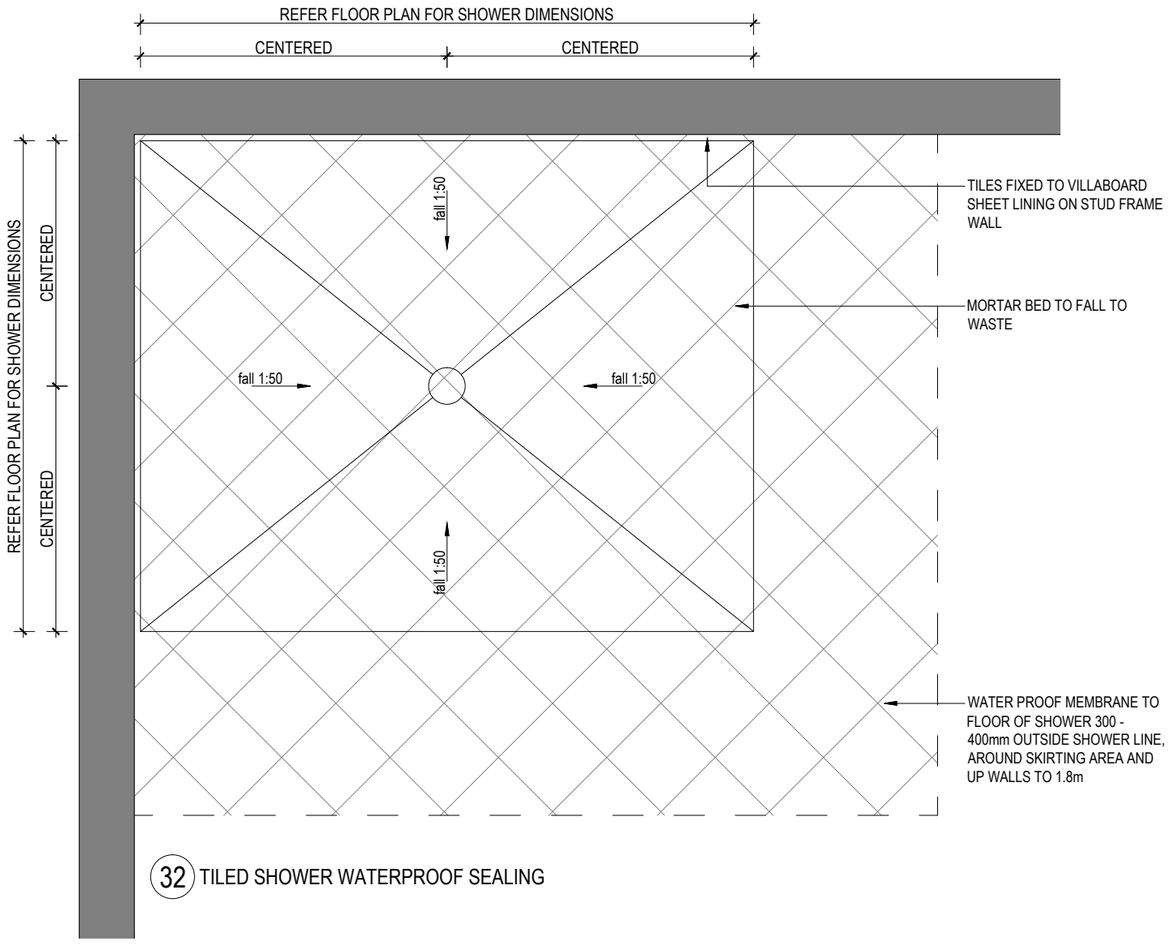
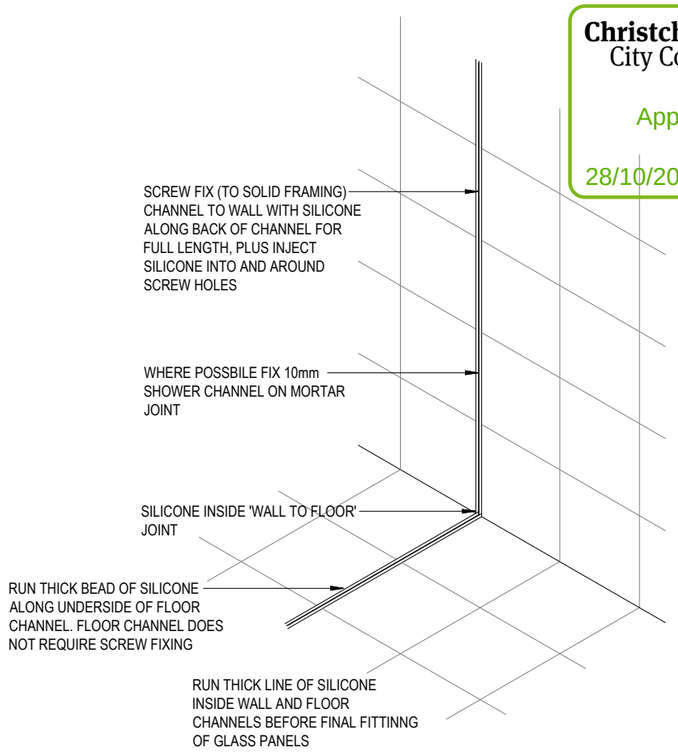


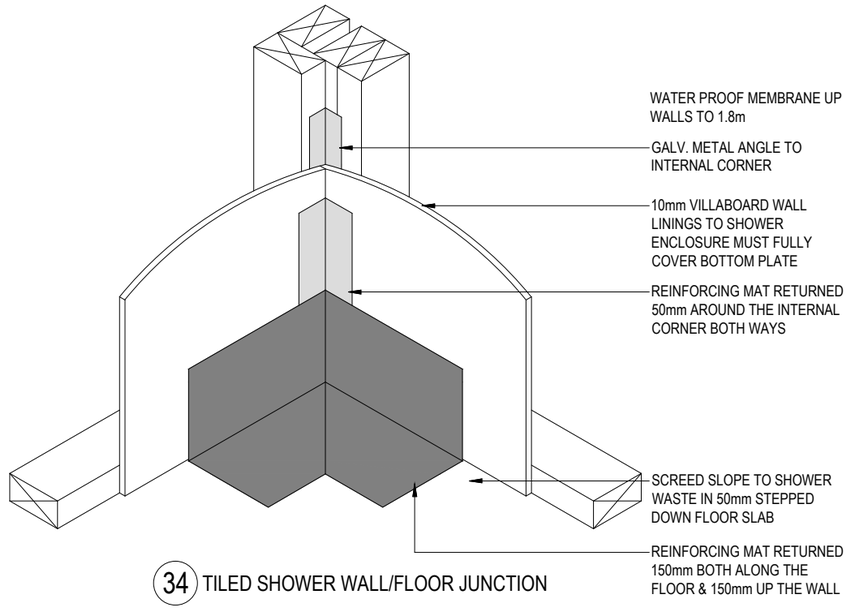
31 TILED SHOWER REBATE



32 TILED SHOWER WATERPROOF SEALING

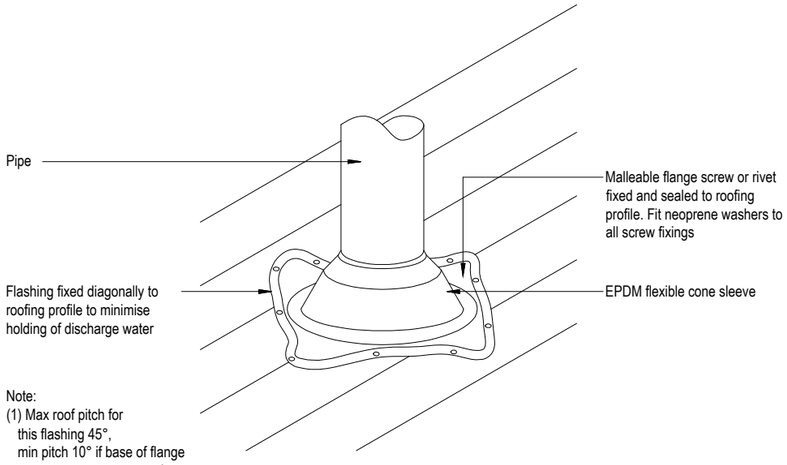


33 GLASS SHOWER DETAIL



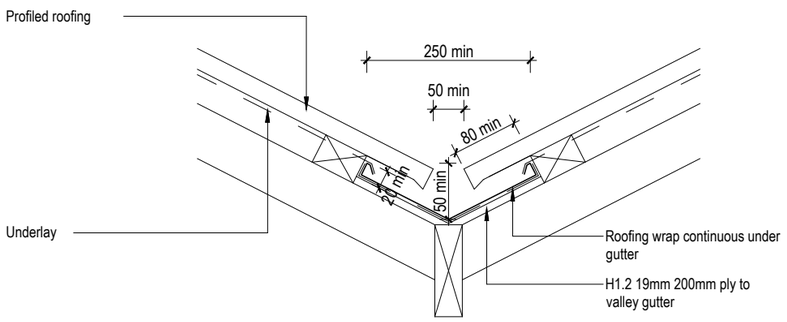
34 TILED SHOWER WALL/FLOOR JUNCTION

a . s . c . a . d . limited ascadltd@snap.net.nz 0272 838 775	job title: BUNN HOUSE	drawing title: DETAILS	legal description: Lot 460 DP 549008 Hoffman Street CHRISTCHURCH	WORKING DRAWINGS SUBJECT TO COUNCIL APPROVAL ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES	scale: 1:10 Job No.: -	page: 20 of: 22 DATE: 30/09/2020

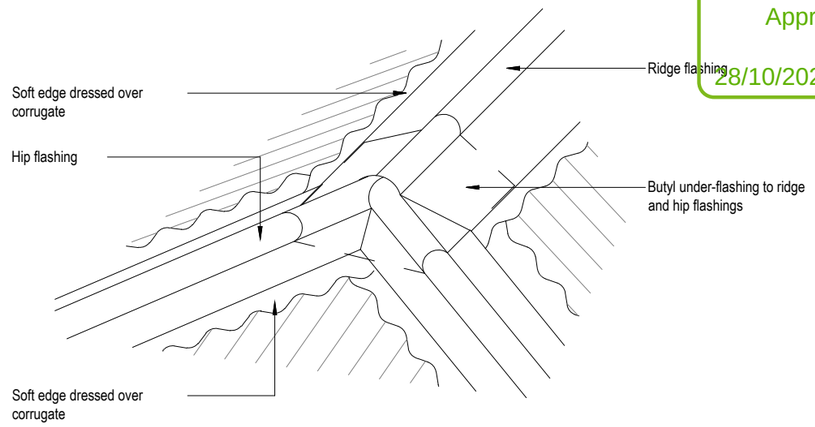


Note:
(1) Max roof pitch for this flashing 45°, min pitch 10° if base of flange covers one or more complete troughs
(2) For pipes up to 85mm dia

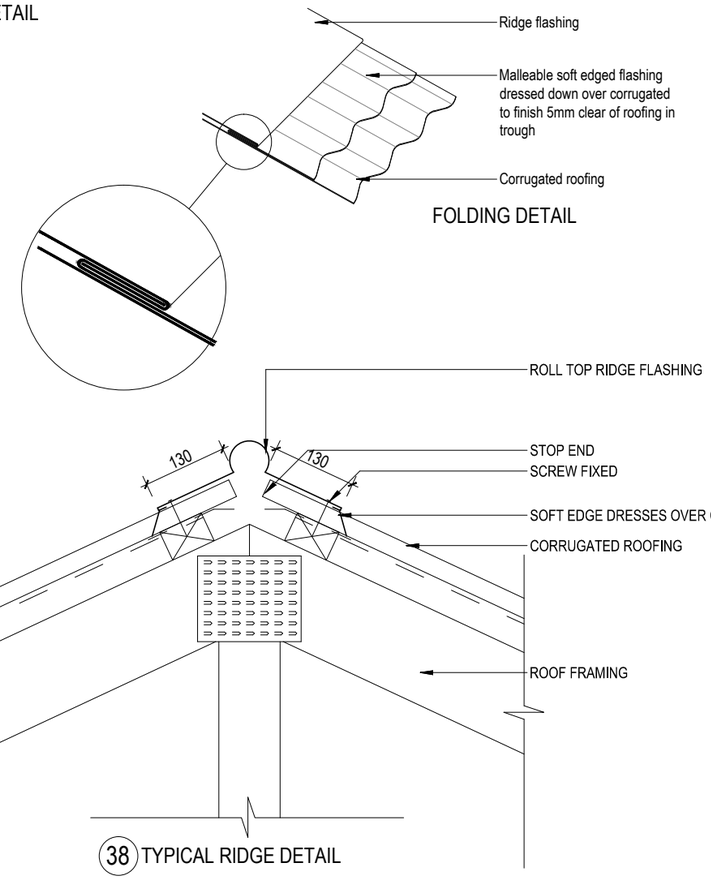
35 PENETRATION DETAIL



36 VALLEY DETAIL



37 HIP DETAIL



38 TYPICAL RIDGE DETAIL

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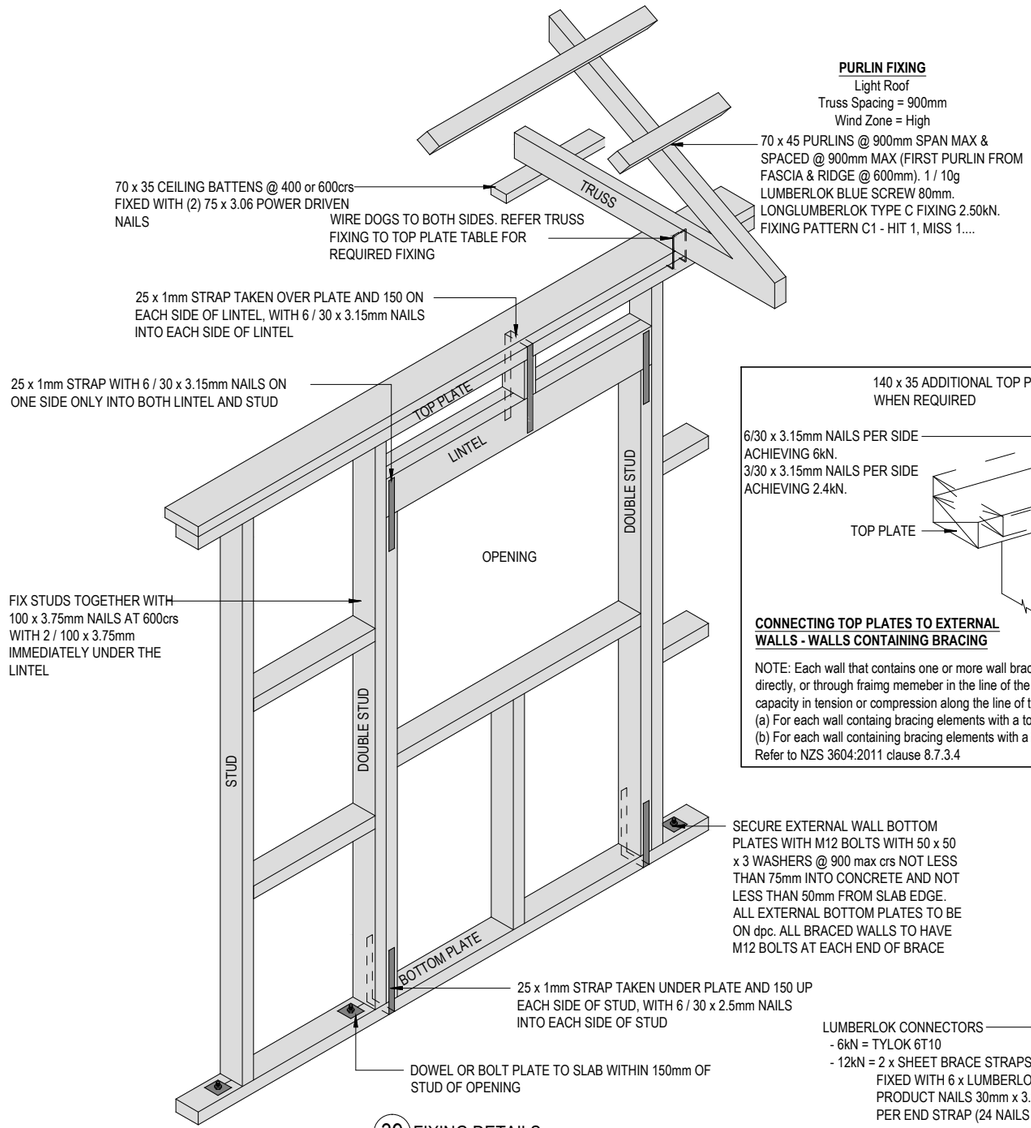
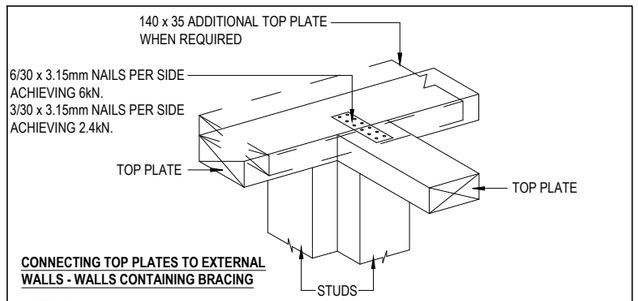


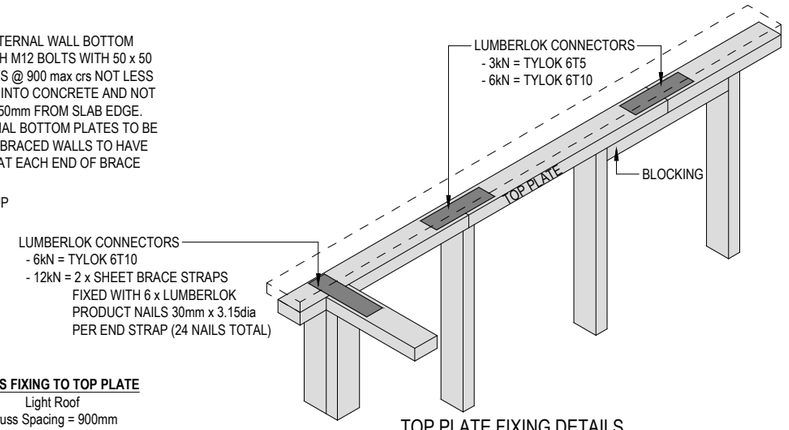
PURLIN FIXING
Light Roof
Truss Spacing = 900mm
Wind Zone = High

70 x 45 PURLINS @ 900mm SPAN MAX & SPACED @ 900mm MAX (FIRST PURLIN FROM FASCIA & RIDGE @ 600mm). 1 / 10g LUMBERLOK BLUE SCREW 80mm. LONGLUMBERLOK TYPE C FIXING 2.50kN. FIXING PATTERN C1 - HIT 1, MISS 1....



CONNECTING TOP PLATES TO EXTERNAL WALLS - WALLS CONTAINING BRACING

NOTE: Each wall that contains one or more wall bracing elements shall be connected at top plate level, either directly, or through fraimg memeber in the line of the wall, to external walls at right angles to it. Top plate fixinf of the capacity in tension or compression along the line of the wall bracing element are given as below.
(a) For each wall containg bracing elements with a total of not more than 250 BUs, the fixing capacity shall be 6 kN.
(b) For each wall containing bracing elements with a total of more that 250 BUs, the fixing capacity shall be 2.4kN.
Refer to NZS 3604:2011 clause 8.7.3.4



TOP PLATE FIXING DETAILS

39 FIXING DETAILS

TOP PLATE FIXING TO STUD
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Wall	Fixing Type
2.0	2 / 90 x 3.15 end nails + 2 wire dog
3.0	2 / 90 x 3.15 end nails + 2 wire dog
4.0	2 / 90 x 3.15 end nails + 2 wire dog
5.0	2 / 90 x 3.15 end nails + 2 wire dog
6.0	2 / 90 x 3.15 end nails + 2 wire dog

TRUSS FIXING TO TOP PLATE
Light Roof
Truss Spacing = 900mm
Wind Zone = High

Loaded Dimension of Support	Fixing Type
3.0	2 / 90 x 3.15 skewed nails + 2 wire dog
3.5	2 / 90 x 3.15 skewed nails + 2 wire dog
4.0	2 / 90 x 3.15 skewed nails + 2 wire dog
4.5	2 / 90 x 3.15 skewed nails + 2 wire dog
5.0	2 / 90 x 3.15 skewed nails + 2 wire dog
5.5	2 / 90 x 3.15 skewed nails + strap fixing
6.0	2 / 90 x 3.15 skewed nails + strap fixing

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ascadltd@snap.net.nz
0272 838 775

job title: BUNN HOUSE

drawing title: DETAILS

legal description: Lot 460 DP 549008
Hoffman Street
CHRISTCHURCH

WORKING DRAWINGS

SUBJECT TO COUNCIL APPROVAL

ALL MEASUREMENTS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK

DO NOT SCALE FROM DRAWINGS UNDER ANY CIRCUMSTANCES

scale: 1:10
Job No.: -

page: 22 of: 22
DATE: 30/09/2020

GENERAL

1. These drawings are not to be used for construction until the plan (sheet S2) is signed by the main contractor

2. Do not scale. refer any discrepancies to the architect/engineer.

3. These drawings are to be read in conjunction with the Architects & Engineers drawings.

4. The builder shall be responsible for any damage to works during construction.

5. The sand blinding layer shall be 20mm min. & 50mm max. to aid levelling & to prevent rocking of pods.

6. Vapour barrier to be 0.25mm (250 micron) polythene complying with NZS 4229. / NZS 3604

7. Finished ground level adjacent to slab to be protected from wind, water erosion and undermining.

FOUNDATIONS

1. For assumed allowable bearing capacity refer to calculations/installer guide. Unless otherwise noted in documentation

2. If there is any doubt about the integrity of the material on which the slab is to be founded - an Engco representative must be notified immediately.

GEOTECHNICAL REFERENCE:

Refer: Aurecon
Ref. 235361
Dated: 21st August 2020

CONCRETE

1. All workmanship & materials to conform to NZS 3109, NZS 4210 & local authority regulations.

2. Minimum covers to reinforcement:

- Exposed to earth - 75mm.
- Protected by vapour barrier - 50mm.
- Not exposed to weather except for a brief period during construction - 25mm.

3. No holes or chases other than those specified are to be made in the slab without the approval of the Engineer.

4. All concrete shall be 20 MPa FIRTH Raftmix grade with 20mm nominal maximum aggregate size & 120mm slump & shall comply with NZS 3109.

5. All concrete to be mechanically vibrated & carefully worked around the reinforcement & into the corners of the formwork.

INSPECTIONS

Inform ENGCO consulting 48 hours in advance of any inspections required for code compliance certification.
Contact ENGCO - Ph. 03 366 7955 & quote ENGCO Ref. No.

INSPECTIONS REQUIRED

1. Site Strip - Bearing Capacity Confirmation.

2. Pre-pour of slab

Christchurch City Council
Page 23 of 28
BCN/2020/10038
Approved Building Consent Document
28/10/2020 Cate McPherson

STEEL

1. All reinforcing shall be new Zealand sourced and conform to AS/NZS 4671 :2001 in grade 300 or grade 500E.

2. All bends to be made cold without fracture.

3. All reinforcing shall be deformed type unless otherwise stated.

4. Grade 500E deformed bars shall be designated 'H', Grade 300 deformed bars shall be designated 'D' and Grade 300 round bars shall be designated 'R'

5. Minimum bar splice 720mm. (or unless otherwide noted)

6. All reinforcement to be fixed & tied where necessary in its specified position.

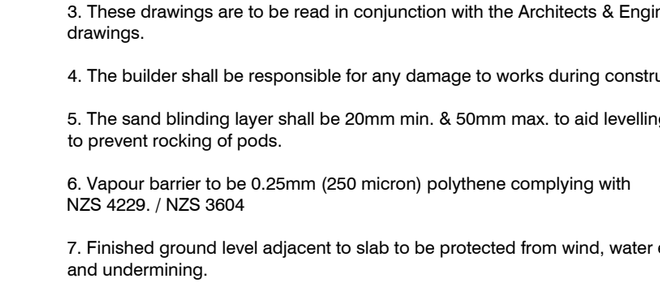
7. Welding of steel is not permitted

8. Spacers:

- Edge at 1200mm ctrs (one on edge & two on corners, typically).
- Internal one on each side of pod (typically).
- 50mm mesh chairs to be used

9. All mesh shall comply with AS/NZS 4671 & shall conform with elongation requirements exceeding 10%.

10. All Mesh shall lap a minimum of 250 m.m.
(ensure end extensions are not included in lap length)

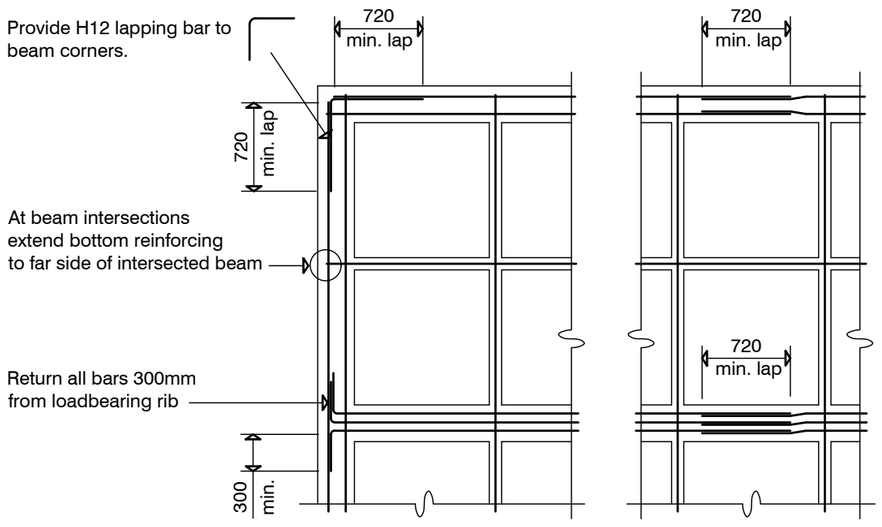


BUILDING PLATFORM

N.T.S.

BUILDING PLATFORM TABLE:	
B	300mm
D	Strip turfed top soil to 150mm approx. depth - confirm soil condition before backfilling
T	Not Required
R	Not Required
F	AP40 or AP65 fill. - 95% Dry Density. Compact in 200mm layers (max.) Fill as required to suit FFL, allow for 20mm coarse sand blinding min.

Refer to Architects drawings for finished floor level



TYPICAL CORNER STEEL & MIN. LAPPING REQUIREMENTS

N.T.S.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

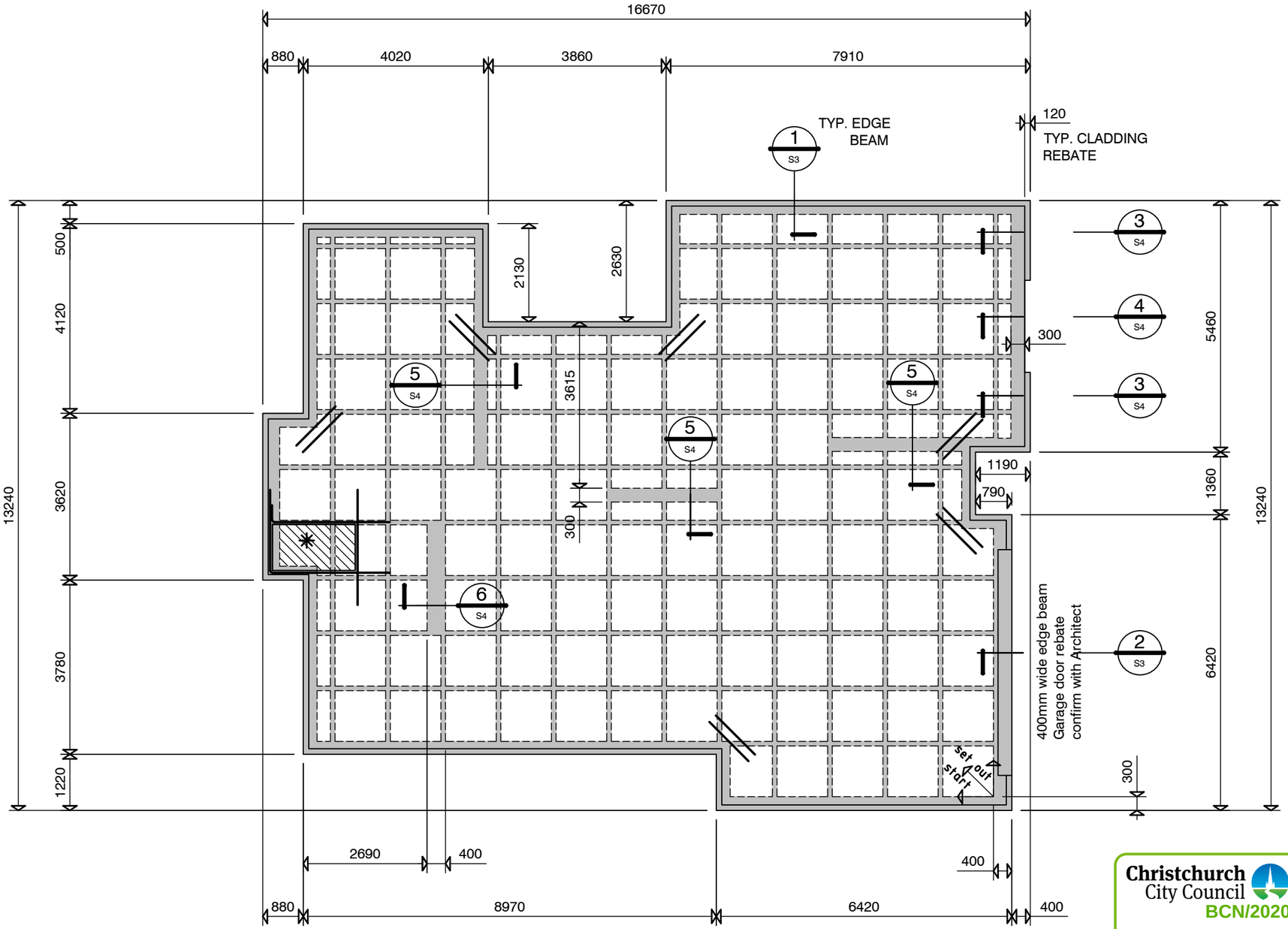
BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

GENERAL NOTES

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
dwg S1
rev.

contractor shall verify all dimensions before commencing work



GENERAL NOTES:

Locations shown of internal floor beam thickenings are indicative only. It shall be the responsibility of the Contractor to ensure that they are located centrally under the load bearing walls to which they pertain.

Under no circumstance should pipework for services be run longitudinally in 100mm ribs. Similarly they should not be run along perimeter foundations nor internal floor beam thickenings

Vertical or horizontal penetrations through the foundation edge beam or floor beam thickenings must be made through the middle third of the member - refer Firth Ribraft Technical Solutions manual for specific information. Vertical penetrations should not be made through 100 mm ribs.

KEY:

(2) H12 (x1200) at 200 centres.

85 m.m. Floor Slab - 220mm pods
(20 MPa FIRTH Raftmix)
G500 E SE62 Ductile mesh.

All Mesh shall lap a minimum of 250 m.m.
(End extensions not included).

✳ 50mm shower rebate, maintain min. slab thickness Trim perimeter with H12. extending 750mm past (typ.) (or 300mm return)
Refer to Architects drawings for setout dimensions

RIBRAFT FOUNDATION LAYOUT PLAN

1:100

Confirm all dimensions with Architectural Drawings.

ORIGINAL SIZE = A3

Rev.		

ENGCO Consulting Engineers

ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

RIBRAFT LAYOUT
FOUNDATION PLAN

design	M.CUSIEL
drawn	S.BLOCKLEY
appvd	M.CUSIEL
date	18.09.2020

file 20005.26
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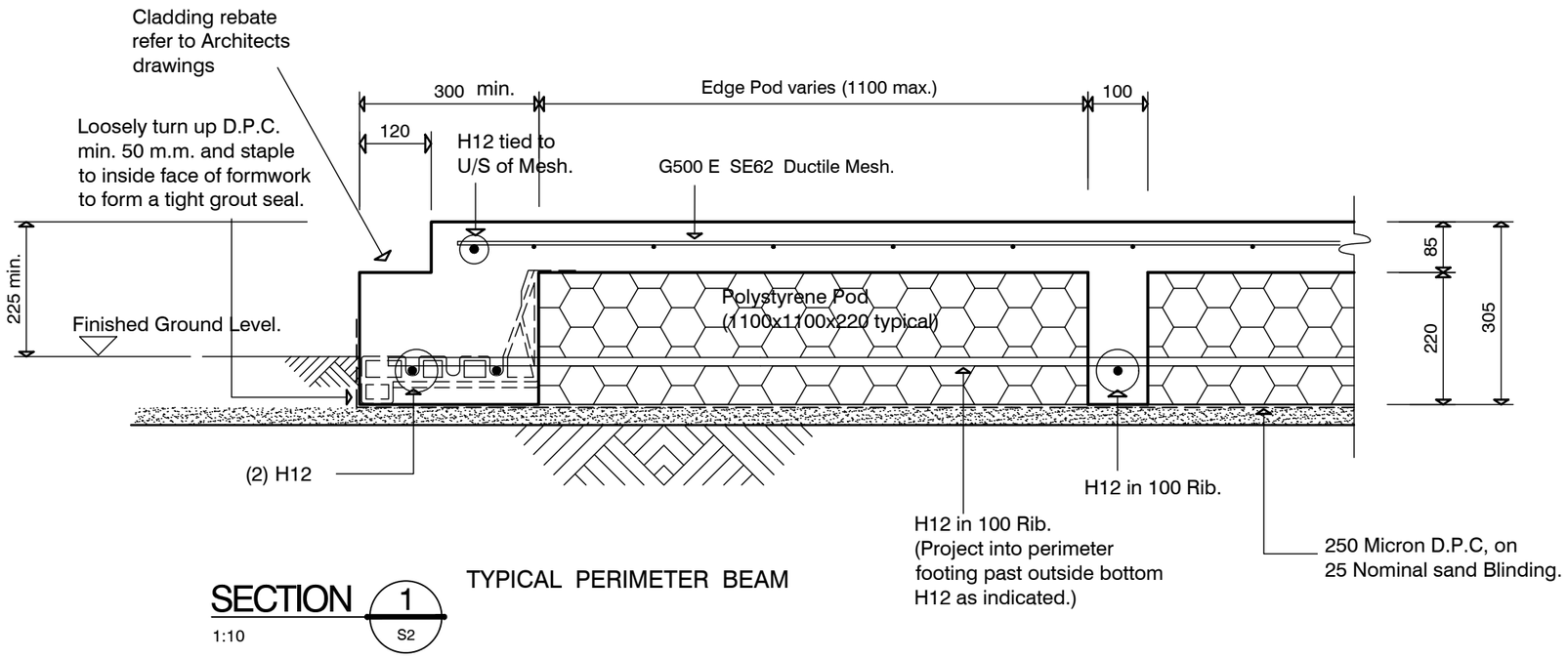
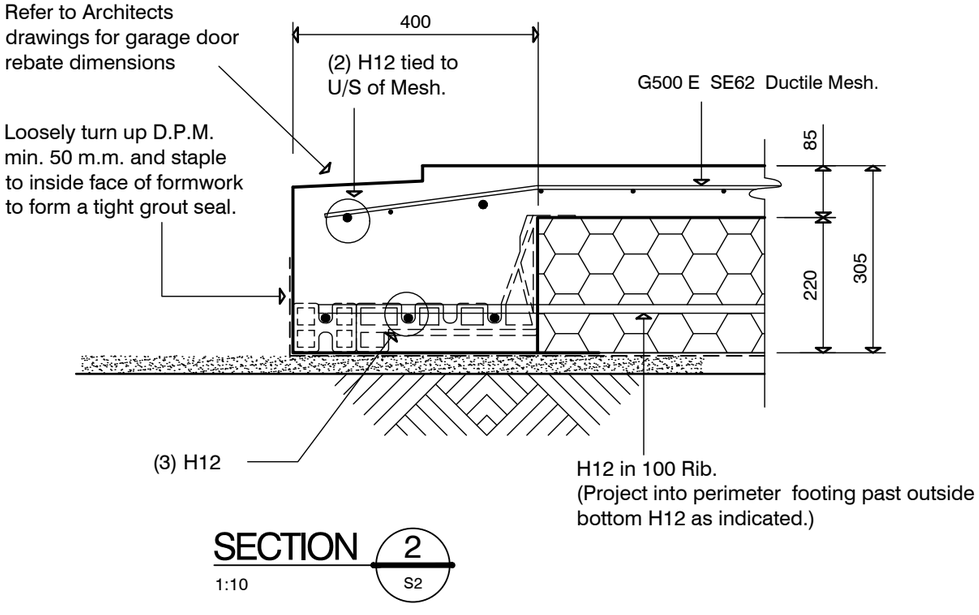
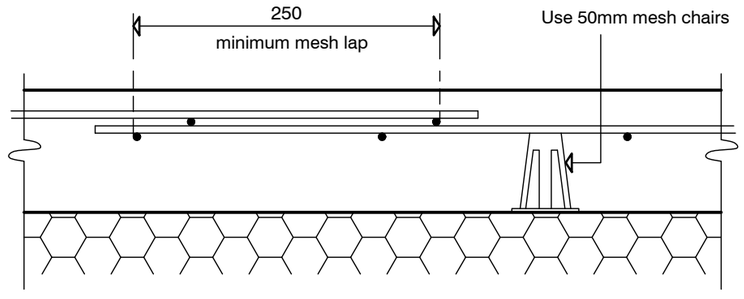


SECTION 1
1:10 S2

TYPICAL PERIMETER BEAM



SECTION 2
1:10 S2



TYPICAL MESH LAP & CHAIR REQUIREMENTS
1:5

ORIGINAL SIZE = A3

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ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

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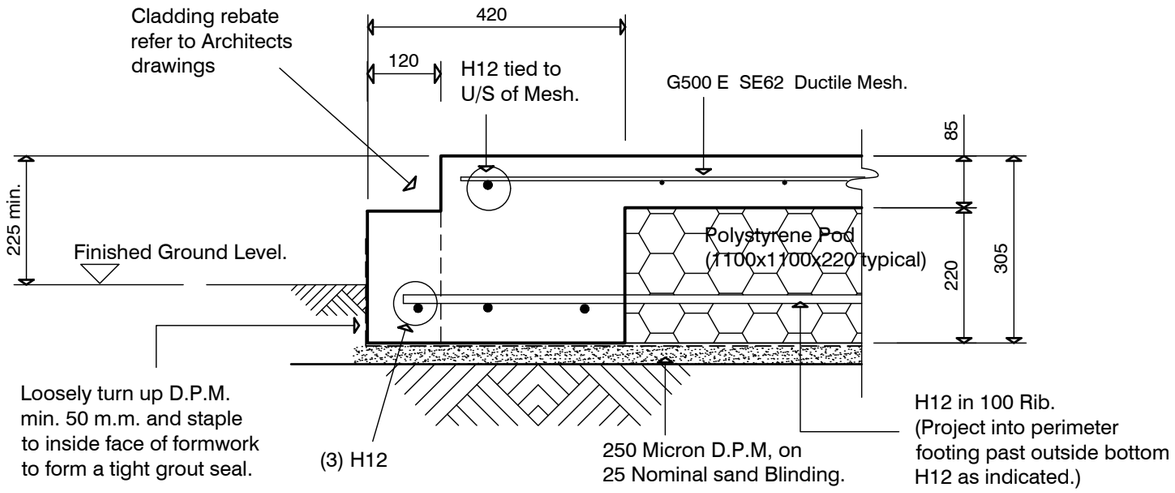
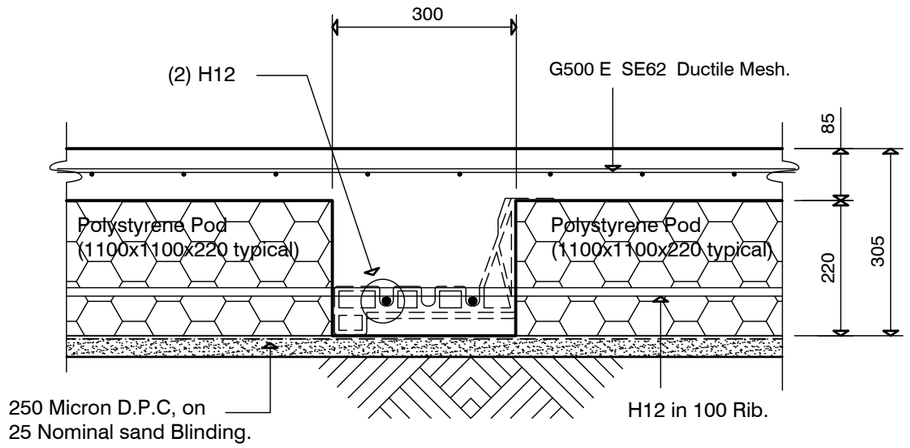


SECTION 3
1:10 S2



SECTION 5
1:10 S2

SECTION 4
1:10 S2

SECTION 6
1:10 S2

ORIGINAL SIZE = A3

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ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

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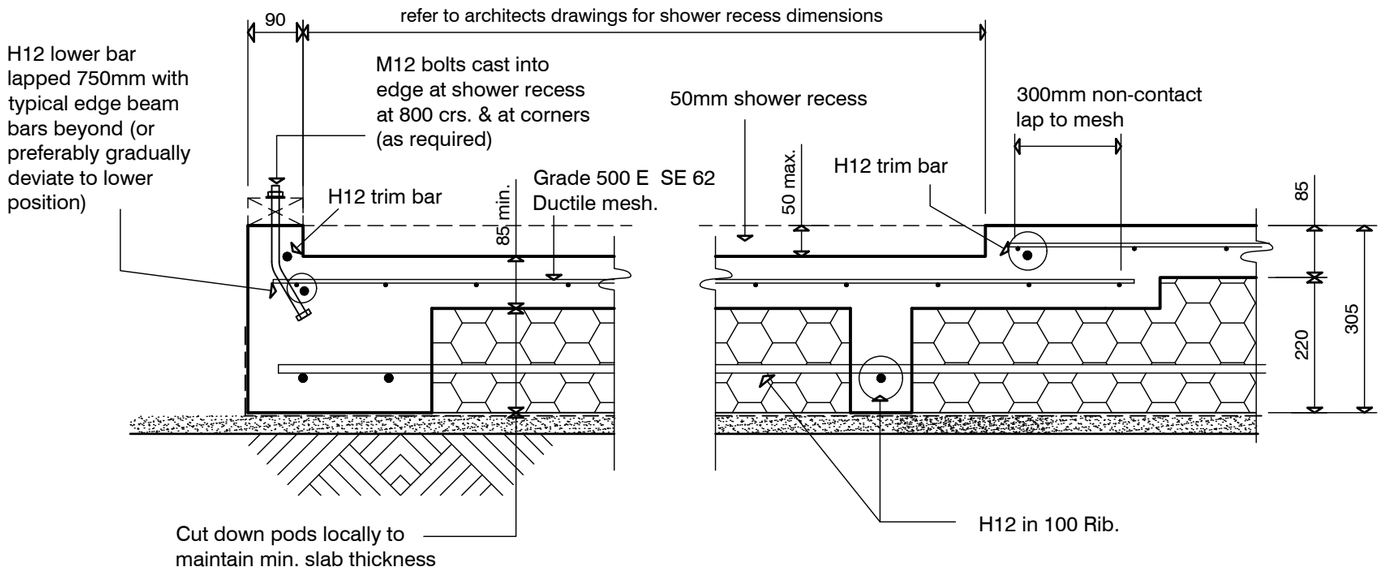
dwg	S4
rev.	



TYPICAL SHOWER RECESS

1:10

ORIGINAL SIZE = A3

Rev.			

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ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL FOUNDATION SECTIONS

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appvd	M.CUSIEL
date	18.09.2020

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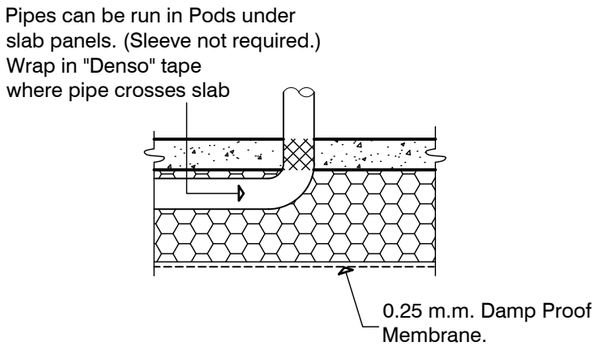
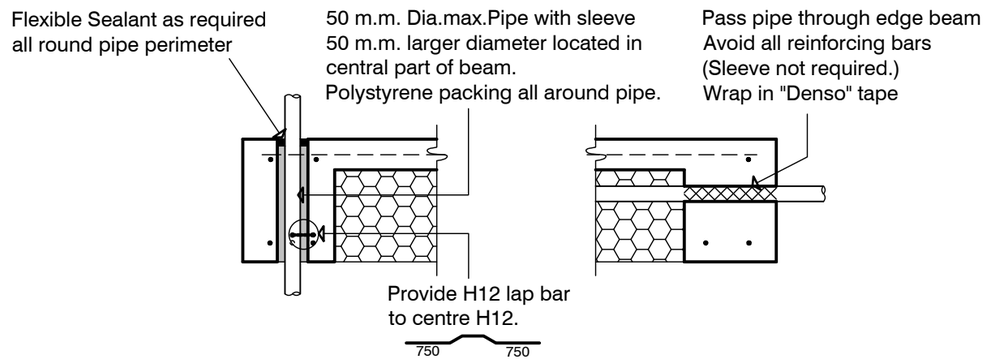
dwg	S5	rev.



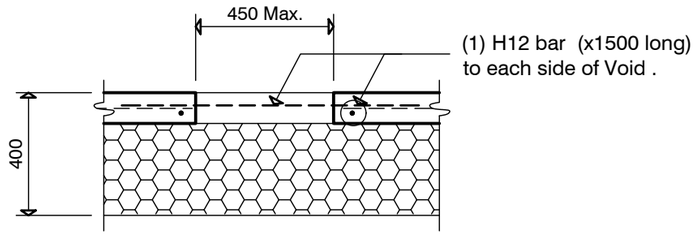
SLAB SERVICES PENETRATION DETAIL.

1:20



FOUNDATION SERVICES PENETRATION DETAILING.

1:20



LARGE SLAB PENETRATION DETAIL.

1:20

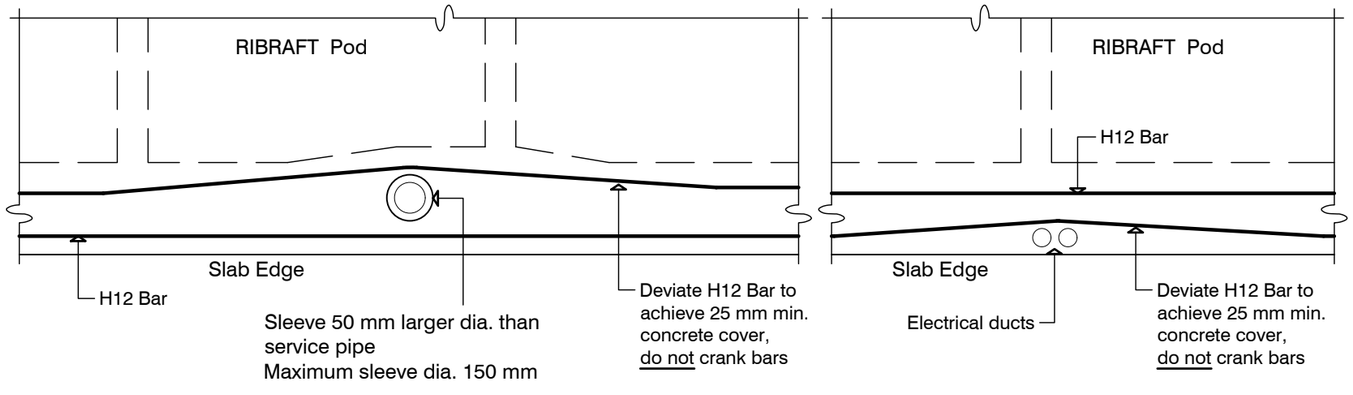
PIPE NOTE:
No separation required where pipes are fully contained within slab.
Sleeve all drains that pass through the base of the slab.

PENETRATIONS NOTE:
Where penetrations through Floor Slab exceed 500 m.m. Square, Crack Control Bars will be required.

Ideally, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, but this may not always be possible.
Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams.
The maximum diameter of the services shall be as outlined in table below.

MAXIMUM DIAMETER OF PIPE SERVICES		
ELEMENT	**VERTICAL SERVICES**	**HORIZONTAL SERVICES**
300mm wide edge beam	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, unless detailed as per note 1.
500mm localised wide edge beam	100mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
300mm wide internal load bearing rib	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
100mm wide internal rib	Nil	50mm in a duct 50mm larger diameter than pipe, see note 1.
Slab	110mm in a duct 50mm larger diameter than pipe or for large services 450mm square see also note 2.	Nil

(1) The need for a duct 50mm larger than the service diameter can be deleted when the pipe work does not cross the interface between the bottom of the RibRaft system and the ground at any point along its length. An example would be services laid within the plane of the pods and passing through the edge beam and discharging to a gully trap or similar. In these cases the diameter of the service can be increased to a maximum of 100mm and a service duct is not required. The pipe work shall be wrapped in denso tape where it crosses concrete elements to prevent adhesion between the concrete and pipe work.



FOUNDATION SERVICES PENETRATION DETAILING

1:20 Services shall not run along ribs or edge beams.

ORIGINAL SIZE = A3

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ROCKSOLID FOUNDATIONS

BUNN HOUSE
LOT 460 - HOFFMAN ST.
PRESTONS PARK, CHRISTCHURCH

TYPICAL SERVICES PENETRATION DETAILS

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